U. S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Dairy Programs
Dairy Grading Branch

DA INSTRUCTION 918-PS

Instructions for DAIRY PLANT SURVEYS

March 3, 2008 Edition

U.S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Dairy Programs
Dairy Grading Branch
1400 Independence Ave., S. W.
Washington, DC 20250-0230

DA INSTRUCTION NO. 918-PS

INSTRUCTIONS FOR DAIRY PLANT SURVEYS

This document has been prepared using all available, pertinent information. It has been reviewed by appropriate Washington, D.C. and field employees for accuracy and usefulness. All persuasive review comments have been incorporated.

ISSUANCE HISTORY

Initially Issued	June 18, 1998
Revision of pages G-5 and G-6	October 24, 1998
Pages 4, 8, 18-28; Page A 19-22, 29-34, 44-49, 77-80	September 1, 1999
Page B 28, 34-35; Page C 5-8, 11, 17, 22-23	September 1, 1999
Page D 19, 31-42; Page K 11; Page W 20	September 1, 1999
Page Z entire section updated, Exhibits 4 & 5 added	September 1, 1999
Pages B, C, D, K, W	September 1, 1999
Page A	December 2, 1999
Pages 1-40, Page Z	January 13, 2000
Page D	February 2, 2002
Page A	December 26, 2002
Page M	January 29, 2003
Page A	January 5, 2004
Page B	January 10, 2004
Page C	January 13, 2004
Page G and Page K	January 30, 2004
Page N18, and N25	January 31, 2004
Page W, Table of Contents, Index	February 18, 2004
Page M	July 4, 2004
Section I-IV and Pages A, B, W	March 3, 2008

/s/
Chief
Dairy Grading Branch

March 3, 2008
Date

Comments on this Document

AMS will continue to update and revise this guideline as additional information becomes available and as technologies and requirements change. If you would like to suggest revisions please send correspondence to:

National Program Coordinator, Plant Surveys, Equipment and Facility Reviews
USDA/AMS/Dairy Grading Branch
Room 2746 - S
1400 Independence Ave., S. W.
Washington, D.C. 20250-0230

Phone 202-720-3171
Fax 202-720-2643

You also may email suggestions and comments to the contact listed on our web page for Dairy Plant Surveys.

The address is for our home page is: http://www.ams.usda.gov/DairyGrading.

Table of Contents

Page C. Inspection of Cheese Making Operations

Page D. Inspection of Dry Products—Spray Process

Page N. Inspection of Natural Cheese Cutting and Shredding Operations

U.S. Department of Agriculture
Agricultural Marketing Service
Dairy Programs
Dairy Grading Branch
Washington, DC 20250

DA INSTRUCTION NO. 918-PS
June 18, 1997
SUPERSEDING
DA INSTRUCTION NO. 918-70
October 1, 1991 and Supplements
and Amendments Thereto

NOTICE TO INSPECTORS

General Instructions for Performing Dairy Plant Surveys

USDA inspection and grading activities are performed under authority contained in the Agricultural Marketing Act of 1946. Inspection and grading services are provided on a voluntary basis and costs are borne by the applicant. Only dairy or dairy related products manufactured, processed, and packaged in a USDA approved plant may be graded or inspected and identified with official grade identification. A plant survey is the basis of determining eligibility for grading and inspection service.

Plant inspections shall be performed in accordance with this Instruction to determine the extent to which facilities, raw material, equipment, and methods of operation are in accordance with 7 CFR 58 subpart B, *General Specifications for Dairy Plants approved for USDA Inspection and Grading Service*, hereafter referred to as the *General Specifications*. Each Item in Section V of this guideline is cross referenced with the applicable subsection of the *General Specifications* (i.e., Item A1—Room Construction (58.126, 58.131) where 58.126 refers to 7 CFR 58.126). In addition, this guideline uses “shall” to expresses a provision that is mandatory. While “should” expresses recommended nonmandatory provisions that when followed would significantly aid in a quality improvement program.

I. Performance of Plant Surveys

A. Prerequisites to Performing Inspection.

In addition to this instruction, the inspector shall have the following documents and equipment:

1. *General Specifications*.

2. A clipboard, applicable plant survey forms DA-151, and supply of paper for recommendations.

3. A flashlight, preferably three cell or equivalent, for inspection of equipment.

4. A portable spotlight. To be furnished by National Field Office, State Agency, or Resident Plant, as applicable, for inspecting silo tanks, batch churns, evaporators, dryers, etc.

5. A salimeter. (To be furnished to inspectors who survey butter operations to check salinity of brine for treating parchment liners for butter boxes).

6. A magnifying flashlight for detecting cheese mites. (Needed by cheese factory inspectors.)

7. A light meter (G. E. type 213 or equivalent).

8. The previous survey report, if any (this may not be practical in all instances).

9. A current schedule of fees to determine applicable charges.

10. A complete set of 3-A Sanitary Standards and Accepted Practices.

11. Slides, micro pipettes, slide drying kit, etc. for preparation of DMCC slides.

12. *Guidelines for the control of Abnormal Milk and Screening Tests for Its Detection*.

13. DA Instruction 918-I, Section P Salmonella Surveillance Program (needed by inspectors of drying operations).

14. DA Instruction 918-S, Section H (for Inspectors doing cursory surveys).

15. The most recent edition of *Dairy Plants Surveyed and Approved for USDA Grading Service*, hereafter referred to as the *Approved Plant Book.*

16. The most recent edition of *USDA -Dairy Accepted Equipment List*, hereafter referred to as the *Accepted Equipment List*.

17. The most recent edition of *USDA Guidelines for the Sanitary Design and Fabrication of Dairy Processing Equipment*, hereafter referred to as the *USDA Equipment Guidelines*.

18. Any applicable supplementary instruction or memos.

B. Inspector's Apparel and Appearance.

During the survey, clean white clothing should be worn, together with a white hat or cap. When applicable, protective headgear should be worn for safety considerations. Although wearing a white laboratory coat over regular street clothes is satisfactory, inspectors are encouraged to wear white shirts and trousers. The USDA emblem should be displayed on the outer clothing or hat. If hair is long, a hair net is required. Inspectors shall be well groomed, clean, and maintain a high level of personal hygiene (see DA Instruction 918-I, Section D).

C. Survey to Be Unannounced.

Insofar as practical, plant surveys shall be unannounced. To be meaningful, a survey should be an impartial evaluation of day-to-day operating conditions as they are normally conducted. Advance information about an impending inspection may lead to special short-lived precautions not typical of usual performance. Surveys made under such conditions cannot deliver the full potential and value of the service to the applicant. With the exception of initial inspection of plants not previously covered by the USDA plant inspection program and follow-up surveys, the concept of unannounced inspections has been a foundation of the integrity of our plant survey program from its inception. It is a concept, therefore, that is not to be altered without sufficient restrictions to safeguard the purpose and integrity of the program.

Modernization of the manufactured dairy products industry is resulting in an increasing number of extremely large, automated, multi-product processing plants which are designed to be operated on a virtually continuous basis. It can be assumed that this trend will continue as plants strive for the most economical production methods. It is not reasonable to expect that a large plant designed to operate around the clock is capable of discontinuing production for an extended period of time upon the arrival of the inspector at the plant. It would be necessary for the plant to plan for the diversion of milk, reschedule shipping, and plan for employees to accommodate our inspection needs.

Therefore, advance scheduling of surveys with plant managers will be permitted in accordance with the following guidelines:

1. Advance scheduling is not to be universally applied to all dairy plants utilizing USDA inspections. For such consideration, plants must be large, high volume plants operating on an essentially continuous schedule. Advance scheduling can only be applied with the approval of the National Field Director.

2. Prior to arranging a plant survey, request the plant's operating schedule. If the plant incorporates “low production” or “down” days during the week or routinely schedules various plant departments for rotating “down” schedules which would allow for a progressive survey, then the USDA survey can retain much of its unannounced feature utilizing this knowledge for arriving at the plant without prior scheduling.

3. It is the USDA position that if special scheduling of an inspection is required, it is the plant's responsibility to provide downtime during the normal Monday through Friday work week for the inspection. Weekend or holiday scheduling of USDA surveys is to be discouraged. However, at the discretion of the National Field Director, weekend or holiday work may be approved.

4. When plant inspections have been scheduled with plant management, all areas of the plant and equipment utilized in the production of products covered by the USDA inspection are to be available for review. Arrange for plant employees to be available to disassemble equipment for inspection as needed.

5. An unannounced cursory survey of the plant shall be conducted in conjunction with the scheduled plant inspection in order to evaluate plant conditions during processing periods. The unannounced walk-through should include inspection of any equipment which may be available. It may be conducted either before or after the scheduled inspection, provided it is within two weeks of the scheduled inspection. All conditions observed during the unannounced walk-through are to be included in the official survey report and will be considered in the assignment of the plant status.

   If serious unsatisfactory conditions are observed during the cursory survey, the National Field Director may make an appropriate plant status change (for instance INELIGIBLE or PROBATIONARY 10-DAYS) without making a scheduled complete survey.

6. Plant survey guidelines and plant status assignment guidelines are to be adhered to closely. Plants which are unable to satisfy the basic minimum requirements for approval during a scheduled inspection shall be assigned the INELIGIBLE status.

7. Whenever extended run plants are encountered, regardless of whether or not advance scheduling is provided, give special attention to the suitability of the equipment and process for the long runs with infrequent cleanup. The process and equipment must be evaluated in light of potential quality or public health problems which might arise from the extended production periods. The National Field Director should consider the plant complexity and the decision making required for the survey and, when appropriate, arrange for assistance by a supervisor.

Scheduled plant surveys should be kept to the barest minimum. The unannounced aspect of our inspection programs should be retained wherever possible.

D. Arrangements with Management for the Inspection.

Upon arrival at the plant and prior to starting an inspection, contact the manager or employee in charge and state the purpose of the inspection (an exception to this procedure might be when different arrangements have been made with the manager at a prior survey). It is, of course, a manager's option to authorize you to contact subordinates directly or to start nighttime inspections without special notification to management. In addition, ask that someone be assigned to accompany you during the inspection to take note of any deficiencies which might be observed, and when applicable, to dismantle equipment and reassemble it after inspection. Avoid hammering, prying or otherwise forcing equipment components, which could cause breakage or other damage. It is satisfactory to discuss survey findings with the assigned company representative, department foreman, etc., but do not give instructions to company employees.

In the event that a survey is declined when you arrive at the plant, respect management wishes, but advise that charges will apply for the time and expenses involved for the unnecessary trip. Also advise the manager that dairy products made at the plant will be INELIGIBLE for USDA inspection and grading service. Handle the situation similarly if you are asked to discontinue a survey in progress. Only the Cover Page and Page Z need to be submitted to cover a refused survey. Show applicable charges on the Cover Page, together with a brief description about the management request. Use Page Z to show the previous plant status and the current INELIGIBLE status.

E. Extent of Survey Coverage.

Ask management which operations and products should be covered by the inspection and handle accordingly. The report should clearly state the operations included in the survey. No status shall be assigned for uninspected operations.

F. Inspection requirements.

Make the inspection in accordance with requirements outlined in the *General Specifications* and the detailed guidance outlined in Section V of this instruction for each item shown on applicable Pages of the survey report.

G. Requirements for Listing in The *Approved Plant Book*.

Dairy manufacturing operations with an approved status are listed in the *Approved Plant Book* using the following code prefixes to denote products which may be officially graded upon request:

B — Butter products
C — Cheese and cheese products
D — Dry milk products
F — Frozen dessert products
M — Milk and fluid dairy products
S — Specialty products
W — Whey and whey products

Dairy Grading Branch will also inspect and approve packaging and processing operations that utilize dairy ingredients not made by a USDA approved plant. In these operations the survey will include inspection of the facilities, equipment, sanitation, and operating procedures only. Such operations are not eligible to be listed in Section I and are instead listed in Section II in the *Approved Plant Book*, and are designated by "P" codes (denoting "packaging and processing"). "P" code plants are denied from having the same code in Section I.

Products packaged or processed in "P" code plants are normally not eligible for USDA grading service. Such grading service can be provided for short periods or for special orders, only when USDA is satisfied that the dairy ingredients were made by a USDA approved plant, as for instance, when the processing and packaging are performed under continuous USDA inspection.

In order for a product listing to be shown in the *Approved Plant Book*, all plant manufacturing and storage facilities for the product shall be inspected and approved.

Example:

> XYZ Dairy is a cheese operation (approved) and has two separate dryers in the same plant. Their No. 2 dryer operation has an approved status, while the No. 1 operation is rated INELIGIBLE. The survey report should show status of plant as follows:
>
> APPROVED 6-MONTHS — Cheese
> INELIGIBLE —Dry Whey
>
> In the event that the No. 1 dryer is later reconditioned to meet the 3-A Accepted Practices or is decommissioned permanently, the *Approved Plant Book* could show status for the dry whey.

H. Survey Frequency.

Survey frequency will depend on the previously assigned plant status. Following are "standard" plant status designations and the resultant survey frequency:

Previous Status	Next Survey Due
FULL	in 5 to 9 months*
APPROVED 6-MONTHS	in 5 to 9 months*
APPROVED 3-MONTHS	in 2 to 5 months
PROBATIONARY 10-DAYS	in approximately 10 days
NO STATUS ASSIGNED	upon request
INELIGIBLE	upon request

* General Specifications §58.123 requires that USDA approved plants be surveyed at least twice yearly.

When surveys are requested for plant approval, management should be advised that subsequent surveys will be automatically performed at the frequency necessary to maintain approved status for the products involved. Management may, of course, cancel the arrangement at any time.

I. Cursory Surveys.

A cursory survey shall be made in conjunction with all partial surveys. Partial surveys may include follow-up surveys after the assignment of the NO STATUS ASSIGNED or the INELIGIBLE status or surveys of one or more codes in multi-product plants.

A cursory survey consists of checking HTST seals, building construction, operating procedures, housekeeping and pest control, and a cursory check of any equipment that is not currently in use (see DA Instruction 918-S Section H).

Serious deficiencies noted during a cursory survey cannot be ignored. If these deficiencies cause the INELIGIBLE status to be assigned, telephone the National Field Director and report your observations. Depending on the observations, you may be asked to show the condition and applicable recommendation on the current survey report, or arrange for a complete survey.

Example:

A butter/powder plant is assigned the following status on the previous survey:

APPROVED 6-MONTHS — Butter
APPROVED 3-MONTHS — NDM and Dry buttermilk

During the survey of the drying operation, the required cursory survey of the butter operation reveals a category A deficiency. The deficiency shall be listed Page B of on the survey report and the INELIGIBLE status shall be assigned to the B codes on Page Z.

J. Procedure to Follow When a Multi-product Plant Has a Different Status for One or More Codes.

In such instances, survey each operation at the frequency indicated by its previous status. Multi-product plants are entitled to the same in-plant utilization of all approved products that they produce as they have when they receive approved products from other plants. In these instances the survey shall concentrate on the equipment and procedures affecting the code(s) presently due for a survey. Other areas of the plant shall receive a cursory survey.

Example:

A butter/powder plant is assigned the following status ratings:

APPROVED 6-MONTHS —Butter
APPROVED 3-MONTHS —NDM and Dry buttermilk

In approximately 3 months, another plant survey of the dryer operations will be scheduled. The butter making operation will not be scheduled. The survey of the dryer can start at the raw skim storage tanks and the buttermilk balance tank at the churn.

In the course of making the required survey for the dry products, a cursory survey of the butter making operation is also required. However, the codes for the butter making operation should not be listed on Page Z of the report unless there is a change in status.

There may be instances where management will prefer that all operations be surveyed at each survey visit, feeling that the additional time and cost are justified by the finding of small deficiencies before they become serious. Follow management requests in this regard. In any event, only the codes included in the survey or for which status has changed should be listed in the **Status of Plant - This Survey** table on the bottom of Page Z.

K. Short Term Follow-up Surveys (30 Days or Less).

After the NO STATUS ASSIGNED or INELIGIBLE status has been assigned, management may make corrections and request a resurvey. Such requests should be honored as promptly as workforce and workload allows. Short term follow-up surveys are usually of two types:

1. Caused by Category A or B Deficiencies.

When only category A or B deficiencies are responsible for the NO STATUS or the INELIGIBLE status being assigned, the follow-up survey should consist of detailed inspection of those corrective measures, the survey shall also include cursory checks on the entire operation, and summary discussion with management.

Examples:

a. A cheese plant is rated INELIGIBLE on a routine periodic survey due to grease on the agitator dripping into the cheese. Other operations and procedures were satisfactory. One week later, a follow-up survey is requested. It reveals that the agitator has been repaired. This check, and a cursory survey of the facilities and other processing operations, would serve as a satisfactory inspection of the plant for assigning the APPROVED 3-MONTHS status.

b. A creamery is rated INELIGIBLE due to two category B deficiencies in room construction and housekeeping in the make room. Three weeks later, a follow-up survey is requested. It reveals that the make room has been repaired and housekeeping is satisfactory. This check, and a cursory survey of the facilities and other processing operations, would serve as a satisfactory inspection of the plant for assigning the APPROVED 3-MONTHS status.

The Cover page and Page Z should be used to note the improvements and assign the APPROVED 3-MONTHS status. The remaining recommendations should not be re-itemized on the latest survey report. Only the codes for which status has changed should be listed in the **Status of Plant - This Survey** table on the bottom of Page Z. Also, because the survey consisted of a detailed inspection of a very limited number of deficiencies there is no need to fill out the **Status Recommendation Worksheet on** Page Z.

2. Caused by Category C and D Deficiencies.

When numerous category C and D deficiencies, are responsible for the INELIGIBLE status being assigned, the follow-up survey shall consist of detailed inspection of all areas of the plant, premises, equipment, and operating procedures utilized in the production of the products covered by the code(s), followed by summary discussion with management.

Example:

A butter/powder plant is assigned the following status ratings:

INELIGIBLE—Butter
APPROVED 3-MONTHS —NDM and Dry buttermilk

A creamery is rated INELIGIBLE due to numerous sanitation deficiencies and poor operating procedures. Three weeks later, a follow-up survey is requested. A complete survey of all areas of the plant involved with the production of the Butter and a cursory survey of all other operations is required to assign the APPROVED 3-MONTHS status to the Butter codes.

In general, remaining recommendations for the butter operation should be re-itemized on the current survey report so that management will not need to cross-reference the previous report.

The recommendations for the dry products should not be re-itemized on the report. Likewise, the dry product codes should not be listed on Page Z.

L. Long Term Follow-up Surveys (More than 30 Days).

All plants that have been INELIGIBLE for more than 30 days before requesting a follow-up survey shall have a complete survey. Follow the guidelines in Section V of these guidelines. The highest status that can be assigned shall be APPROVED 3-MONTHS.

M. Survey Frequency for Drying Operations and Dry Products Packaging Operations Which Are Under the USDA Salmonella Surveillance Program.

Quarterly sampling of product and environmental samples are required, as outlined in DA Instruction No. 918-I. However, plant surveys will be made at the frequency indicated by the previously assigned plant status. In other words, drying operations rated FULL STATUS, APPROVED 6-MONTHS, or APPROVED 3-MONTHS will be surveyed at the appropriate intervals and salmonella samples will be collected during the survey. The intervening quarterly visit, if required, will be for the purpose of taking samples for Salmonella testing. The intent of this policy is to minimize survey costs to the plants.

During the course of a quarterly sampling, it will ordinarily be necessary to work around the dryer filters, product sifter, and the vacuum cleaner, as well as the warehouse. If serious deficiencies are noted while taking the samples, they cannot be ignored: report the deficiencies by telephone to the National Field Director, who will provide guidance on handling the situation.

Follow DA Instruction 918-I, Section P with respect to sampling procedures and preparation of DMS forms.

N. Inspection Emphasis.

Inspection guidelines are on the applicable survey Pages and Section V of this Instruction. It is recognized that it may not be possible or necessary to check each item of equipment at each survey.

Critical points in the operation should receive the most emphasis during the survey — items such as raw product quality, pasteurization, sanitation, equipment condition, processing procedures, etc. However, to establish management's control of equipment sanitation, for instance, it is not necessary to dismantle and inspect each piece of processing equipment. The inspector may be guided to some extent by survey observations and by the plant history of performance.

Examples:

a. When a plant has an excellent milk can maintenance program as evidenced by previous survey history, inspection of a smaller number of cans would suffice to indicate continued satisfactory control of this item.

b. When the dismantling and inspection of some processing equipment in a plant department shows excellent sanitation, only spot checks need be made of remaining equipment in the department.

c. When pipelines are cleaned by a well engineered, programmed CIP system, satisfactory inspection of pipelines may consist of spot-checking a few lines in each department.

Areas of an operation which have been demonstrated to be under satisfactory control should receive proportionately less attention. It should be the inspector's goal to use time wisely and efficiently by discerning and concentrating on the weakest areas of the plant operation.

O. Grandfather Exemption for Plant Equipment.

A grandfather exemption, as it pertains to equipment and plant inspection activities, is the procedure by which an inspection agency, such as the Dairy Grading Branch, can accomplish the orderly, phased removal or replacement of equipment that has become obsolete due to advances in equipment design or processing techniques. This procedure allows the processor to continue using a piece of equipment or a process which, when it was installed, complied with all then existing requirements, but, which through advances in design or technology, or modification of regulations no longer complies with current standards or requirements.

A grandfather exemption does not sanction improper sanitation or poor maintenance of equipment. All grandfather exempted equipment will eventually wear out or may reach a stage of disrepair such that it can no longer be accepted. At that time, the equipment is to be treated as any other piece of equipment in similar condition and appropriate recommendations for repair or replacement are to be made.

A change in ownership of a processing facility which does not interrupt the cycle of unannounced plant surveys would not alter the grandfather exemption status of items at that facility.

A grandfather exemption, as it is used by the Dairy Grading Branch, is specific to the equipment or plant location and may assume two slightly different applications depending upon the circumstances encountered.

Application I

The policy is specific to a class or model of equipment which may be located at a number of different locations. The grandfather exemption status may be assigned to a particular model because of the lack of available alternatives or long-standing use. An example of this approach would be the use of separators which are commonly used throughout the industry even though all new machines are required to meet the *3-A Sanitary Standards for Centrifugal Separators and Clarifiers, Number 21-,* which became effective November 24, 2002.

Under this application, the grandfather exempted items may move freely between locations until such time as the particular unit is no longer acceptable due to disrepair. Processing facilities utilizing equipment exempted by this application would not be limited from any plant status assignment solely based on the grandfather exemption. Plant status assignment shall be assigned consistent with plant conditions and sanitation. Should an acceptable alternative be developed and become readily available, the Dairy Grading Branch will determine when all of the remaining items would revert to an Application II status.

Application II

The policy is specific to an identified machine located at an identified processing facility. For example, a rotary airlock which does not meet current design criteria could be granted a grandfather exemption as a part of a drying system at an identified drying plant.

Since the grandfather exemption is intended to accomplish the phased withdrawal or replacement of the equipment, movement of the items exempted is monitored or limited. However, the time frame during which a grandfather exemption remains in effect can be quite long. There is no mandatory maximum time period restriction. However, the Dairy Grading Branch may announce the end of a grandfather exemption following notification to the industry and provision of a specific phase out period to accomplish replacement of the equipment.

Under this application, the grandfather exempted equipment is a specific model located at a specific processing facility. The item is not free to move between locations. Status assignments may be made consistent with plant conditions and sanitation. If the item is moved from the identified processing facility to another approved facility, the item shall be upgraded to meet all current standards, requirements and regulations.

In addition, under this application, if the processing facility withdraws from the Dairy Grading Branch plant survey program for an extended period of time equal to or exceeding one year, all grandfather exempted equipment shall be upgraded to current standards, requirements, or regulations in order for the facility to be reinstated as an approved facility. Withdrawal from the plant survey program is not interpreted to include temporary losses of approved status during which the processing facility is actively working to regain approval.

When an approved processing facility that includes some equipment accepted by grandfather exemptions constructs new facilities, the following criteria will apply:

1. The New Facility Is an Expansion or Remodeling of an Existing Building, or a New Building at the Same Site.

All grandfather exemptions granted under Application I and II are permitted to be used in the new facility.

2. The New Facility Is at a New Site Separate from the Original Facility.

Equipment granted a grandfather exemption under Application I is permitted to be used in the new facility. Equipment granted a grandfather exemption under Application II is not permitted to be moved to the new facility without upgrading to current standards, requirements and regulations.

P. Safety Precautions in Plant Inspection Activities.

Dairy Grading Branch inspectors have developed a very good safety record and we want to keep it that way. Here are some pointers to remember in your work:

1. Be careful around electrical equipment. Don't poke around inside live switch boxes. (All switch boxes should be considered live). If you need to obtain insect specimens from electrical equipment, obtain plant assistance.

2. When working around moving gears, belts, shafts, etc., beware of loose clothing getting caught in the works. The tails of long lab coats are particularly dangerous in this respect.

3. Use only good condition ladders for climbing. Install them at a safe angle and make sure the ends are firmly grounded.

4. Be careful on slippery floors and stairways. Footwear with “non-skid” soles will help.

5. Avoid burns from hot pipes or from steam lines.

6. Avoid skin contact with caustics, acids, and other strong chemicals.

7. Ear protection should be worn when appropriate.

8. Eye protection should always be worn around equipment.

9. When working around overhead pipes a plastic bump cap should be worn.

10. Drive carefully! This is probably the most hazardous part of your job. Federal regulations require you to use your seat belt. Don't drive over the posted speed limit. Drive prudently as if your life depends on it. It does.

11. Do not enter a confined space without taking the proper precautions. Deaths have been attributed to carbon monoxide gas apparently formed in dairy equipment by the interaction of alkaline cleaning compounds with milk residues. Look for thorough rinsing after cleaning and airing out afterward. Some equipment can be adequately inspected through doors, sight glasses, inspection ports, and partial entry. Refer to the following chart to decide if full entry is required:

Entry Required	Entry not Required
Evaporator	Bulk trucks
Double O cheese vats	Storage tanks
Box dryer	Cone dryer
Wet collectors	Horizontal cheese vats
Enclosed finishing vats	Cheese conveyors
	Mechanical draining, matting equipment

The plant should have a confined space entry safety program that meets Occupational Safety and Health Administration (OSHA) requirements (which may include entry permits, employee training, atmospheric monitoring equipment, and lock out/tag out procedures). Do not go into any equipment until the plant's representative authorizes entry and follow the procedures required by the plants safety program. If the plant lacks a program that meets OSHA requirements (contained in 29 CFR parts 1900-1999) or the requirements for lock out/tag out below, do not enter any equipment. Note on the survey report what pieces of equipment were not entered, also note any deficiencies in the plants confined space entry program and recommend correction.

12. Each plant should develop specific procedures for control of hazardous energy sources for each piece or type of equipment before maintenance or sanitation inspection is performed. Follow the plant's lock out/tag out procedures before entering equipment such as Double-O vats, box dryers, etc. All equipment that requires full entry is to be locked out/tagged out to protect against accidental equipment energization or startup. If proper lock out is not available do not inspect the equipment in a manner that will put you near the moving parts. When more than one person is at risk, they should each have their own lock on the lock out device

In most cases, only the plant employee will be at risk and only their lock will be on the lock out device. For example, when dismantling a pump the plant's employee should first lock out the power source. Afterwards, the USDA employee inspects the parts while they are on a cart or mat. The plant employee is at risk while disassembling and reassembling the pump, but the USDA employee is not at risk while inspecting the parts. Therefore, only the plant employee's lock would be used.

Note:

Except in emergencies, each lock out/tag out device must be removed by the employee who installed it.

II. Preparation of the Survey Report

A. Show All Required Information on the Cover Page.

1. Applicant and Plant Surveyed.

Record the plant name and address in the applicant box unless management requests the bill be sent to another location. In that case, list the address where the bill should be sent in the applicant box and the plant address in the plant surveyed box. Use the full names and addresses (including Zip Code). Include the state assigned plant number, preferably after the plant name if there is sufficient room or in the plant surveyed box if the plant is the applicant.

2. Type of Plant.

Show only a general description, listing all the products made is not necessary.

Examples:

a. Show “Cheese” although four cheese varieties are made, and whey cream.

b. Show “Butter/Powder” for a plant that makes and packages butter, and makes NDM plus three special dry blend products.

3. Manager.

Show Mr. or Ms. and the managers full name.

4. Purpose of Survey.

Use “Periodic Survey” when this term is applicable. Use other statements when appropriate, such as “Requested survey,” “Follow-up after PROBATIONARY 10-DAY status,” etc.

5. DP- .

Assign one of your certificate numbers to each of the survey reports you do. Place this number on all lab sheets that are associated with that survey (alternative fat, salmonella samples, or DMCC). This is required to track laboratory tests in the system.

6. Date.

List the date of the survey. If the survey requires more than one day show all the dates on the report (include part days and travel days) as 8/4,5/97 or 8/1—3/97.

7. Fee, Expense, and Lab.

Charge your hours according to the current rate. Also, add your expenses to the report. Under Lab, list the current fee for the DMCC test, if applicable. If you Send Salmonella samples to the lab leave the area for lab fees blank. The National Field Office will enter the amount (which depends on the number of tests that require verification).

8. USDA Inspector.

Fill in your name and the name of any other USDA inspector or observer. Each inspector has been assigned an identification number. Please include this number immediately after your name.

B. Determine the Pages Required to Assign Status to the Requested Codes.

All the deficiencies that affect a code will be on a single Page. Therefore, only the deficiencies on Page C affect the cheese codes. Likewise, only the deficiencies on Page D affect the dry whey codes (see the guidelines for D.5 and D.6. in this section for more information).

Approved sources can be purchased or produced within the plant, but if produced within the plant the appropriate Pages are required to determine suitability of the source ingredients. Therefore, to assign the dry whey code Pages A, C, D, and W are required. Assigning status to the intermediate products is not required (i.e., a plant is not required to have the milk, cheese, or fluid whey codes to receive the dry whey code).

When surveying plants with multiple systems (for example two dryers or several process cheese lines) the first step is to decide whether to put the deficiencies from all the systems on a single Page or to use a separate Page for each system. To determine when each system will be on a separate Page, the plants will be assigned to one of the following groups.

1. Plants with multiple dryers and evaporators, or a butter plant that also has a light butter line. In this case a separate survey page for each system shall be used.

2. Plants where the systems can be moved or can direct product throughout the systems downstream. Examples: process cheese lines where the grinders feed several cookers or packaging lines; shredded cheese lines where the equipment is on wheels and moved to a cleaning room after production; two churns feeding the same butter boat or silo. In this case a single survey page shall be used.

3. Systems that are segregated by the plant, if such systems are operated and cleaned separately. Example: process cheese operations divided into loaf and slice departments, each with their own grinders and cookers. In this case a separate survey page for each system shall be used.

In the space provided at the top of each Page, list the product codes affected by the deficiencies on that Page.

Example:

Codes (This Page) *D1, D6, M14*

Page D ● Dry Products

ITEM NO.	CODE: S - SATISFACTORY ITEMS U - UNSATISFACTORY ITEMS ▶	CHECK ONE S	CHECK ONE U				
D1	Room Construction			DRYING	D29	Dryer Dry Cleaning Methods	
D2	Lighting & Ventilation				D30	Vacuum Cleaner	
					D31	Housekeeping	
					D32		
					D33		
					D34	Room Construction	

C. Use a Pencil to Prepare the Report.

Write legibly to allow accurate supervisory review. Do not crowd the information excessively in the "Recommendations" section: use lined insert pages when necessary. Separate Pages can be used if the plant has more than one self contained processing line such as multiple dryers or process cheese lines.

D. For Each Item on the Survey Report, Show a Dash, NA, or a Check Mark in the Satisfactory Column, or the Letter Corresponding to the Deficiency Category in the Unsatisfactory Column.

1. Satisfactory Items.

Show a check (✓) or slash (*/*) mark in the S (satisfactory) column for each applicable item that you were able to check and that you found satisfactory. It is not necessary to show informational comments to substantiate that the item was checked and found satisfactory. Limit such informational type comments to helpful description of the process flow, mention of unique procedures, occasional compliments, etc.

2. Unsatisfactory Items.

Rank the seriousness of each deficiency noted during the survey by inserting the deficiency category letter (A, B, C, D, or E) under the U (unsatisfactory) column for each item number as appropriate (see Item E. Classification of Deficiencies Noted During the Survey below).

3. Items That are Not Applicable to the Plant Being Surveyed.

Show NA in the satisfactory column when an item is not applicable to the plant operation. Additional explanatory comment may or may not be required.

Sometimes, entire sections of the survey report page may not be applicable. In such instances, write “Not Applicable” or “NA” in the box with the heading for the section or show a brief explanatory comment in the “Remarks section.”

4. Items not Checked this Survey.

Inspecting all items on each survey is usually impossible. However, any item from the last survey report classified as a category A or B deficiency shall be included in the current survey. If an item has not been inspected, do not show a check mark. Show a dash in the S column. If a category C, D, or E deficiency was noted for the item on the previous report repeat the recommendation with a notation such as: “In use this survey,” “Not looked at this survey,” or words to that effect. Also repeat the deficiency classification letter under the U column of the item on the current report. If a large area of the plant was not included in the current survey but was included in the previous survey (e.g., a plant with two or more dryers) you should make a photocopy of that section and include it with the current report.

Examples:

	D14			
	D15	Room Construction		D
	D16	Lighting & Ventilation	√	
	D17	Pumps, Pipelines, & Valves	- -	D
	D18	Product Preheaters	NA	
	D19	High Pressure Pump		C
DRYING	D20	Dryer Air Supply	√	
	D21	Dryer Air Heating System	/	

RECOMMENDATIONS: (List by Item No.)

D15. — Continue to scrape the peeling paint from the walls (one small area near the south entrance to the room)(D).

D17. — In use this survey: Dismantle the pump next to the balance tank for daily hand cleaning (slight product present on the pump back plate)(D).

D18. — Product is pumped to the dryer directly from the evaporator.

D19. — Improve cleaning of the High Pressure pump (definite product noted around valve seats)(C).

5. Items That Affect More Than One Code on Different Pages.

Some deficiencies may affect more than one code. This is especially true of the general items (Items A33-A40). In this case, record the category of the deficiency and write out the recommendation. On other Pages where codes are affected, record the deficiency category in the U column, then reference the recommendation on the original Page. If there are codes on the Page not affected by the deficiency, these shall be clearly identified.

Example:

> A butter plant also has codes for condensed and dry buttermilk. Therefore, an unapproved source of cream affects all three codes. Show the following recommendations in addition to listing a category A deficiency in the U column for Items B58 and D50.
>
> (on Page B)
> B58. — Discontinue receiving cream from unapproved sources (A).
>
> (on Page D)
> D50. — See Item B58 (A).

or to the right of Item D50—Source Ingredients on Page D write “See Item B58" and record the category in the U column.

6. Items That do not Affect All the Codes on a Page.

If in the above example, the plant had other condensed or dry product codes that are not affected by the unapproved source of cream, list them in the recommendations section. Using the same example as above, except that the plant also has the codes for condensed and dry milk. The recommendation on Page D should be as follows:

Example:

> D50. — See Item B58 (A). Unapproved source does not affect the M8 or D1 codes.

E. Classification of Deficiencies Noted During the Survey.

The classification system relies on the Inspector's technical and professional expertise to assign each deficiency to a category that accurately describes and documents its seriousness. This will point out the deficiencies that lead to the status recommendation and help the National Field Office, the Washington Office, the plant, and other interested parties to more easily understand the conditions that existed in the plant.

Each deficiency noted on the survey report shall be classified according to one of the five categories. The most serious deficiencies will be classified as category A, less serious

deficiencies as category B, and on through C, D, and E. The seriousness of deficiencies will vary according to their location within the plant or process and will be unique to each observation. Each deficiency is to be classified as independently as possible from the other deficiencies noted. The inspector shall use good judgment when applying the guidelines and examples presented below.

First consider what, if any, affects on public health the deficiency will have. Then determine the likelihood that product has or will become contaminated or unwholesome during the time that will be required to correct the deficiency. Next, decide the extent of the deficiency. Deficiencies that by themselves are not serious may be part of a larger problem that would move them into the next higher category. For example, a very slight film on the interior of the unseparated whey tank may indicate a plugged spray ball, or it may represent a problem with the CIP system. In the first case the deficiency is relatively minor, easily corrected, and has negligible effect on plant status. In the latter it is likely that other equipment may be affected and the deficiency requires immediate and effective corrective action to maintain product quality and plant status. Lastly, assign the deficiency to a category using the guidelines below.

1. Category - A (Classification - Critical).

This category includes pest control and product contamination. Contamination is of two types: Public health concerns (mold, toxins, viral, fecal, and bacteria), and unwholesomeness due to extraneous material (paint, plaster, metal, cleaning compounds, etc.). Category B deficiencies from the preceding report that have not been corrected or which have recurred shall be classified as Category A for the present report.

Examples:

a. Infestation of insects, rodents, and other vermin.

b. Adulteration of products with chemicals or other foreign material.

c. Unsanitary conditions or practices observed or confirmed that is of such serious degree that wholesomeness or safety of the final product is immediately threatened.

d. Critical deficiencies in the facilities or housekeeping.

2. Category - B (Classification - Probable Contamination).

Contamination has not been observed but will happen without immediate corrective measures. Also, contamination, when it occurs, will be equivalent to the conditions considered as critical (category A). Category C deficiencies from the preceding report that have not been corrected or which have recurred can be classified as Category B for the present report. Inspectors will need to consider if the response of the plant was appropriate and adequate, if the chance of

contamination has increased, and what the effect would be if the same response occurred after the present survey.

Examples:

a. Unsanitary conditions or practices observed or confirmed that are of such serious degree that the wholesomeness or safety of the final product is threatened unless changes are made immediately.

b. Contamination of the product will happen with high probability.

c. Prompt corrective actions will be required to prevent the contamination from occurring.

d. Definite deficiencies in the facilities or housekeeping.

Category A and B deficiencies concerning sanitation will usually be reserved for post pasteurization contamination. Exceptions should be made if the deficiency will likely result in a public health hazard or contamination with extraneous material (such as gross negligence of cleanup).

3. Category - C (Classification - Potential Contamination).

This category is applicable to sanitation, equipment, and facility deficiencies that will contaminate finished products if left uncorrected. These deficiencies may require some time to correct but contamination of product will not likely occur during this period. Category D deficiencies from the preceding report that have not been corrected or which have recurred can be classified as Category C for the present report. Inspectors will need to consider if the response of the plant was appropriate and adequate, if the chance of contamination has increased, and what the effect would be if the same response occurred after the present survey.

Examples:

a. Unsanitary conditions or practices noted at a level such that product wholesomeness is not immediately threatened but will eventually occur.

b. Contamination of the finished product will eventually occur if the deficiencies remain uncorrected.

c. Corrective actions should be made in a timely manner but are not required immediately to prevent the contamination from occurring.

d. Moderate deficiencies in the facilities or housekeeping.

4. Category - D (Classification - Product Quality).

These deficiencies are of minor significance and each by itself has very little effect on plant status, however, an excessive number could cause status to be reduced. Most Category D deficiencies will become Category C if neglected. This category should also be used for environmental deficiencies (category E) that have advanced to the point that the product can become threatened.

Examples:

a. Unsatisfactory conditions or practices noted at a level such that product wholesomeness is not threatened.

b. Contamination, if it occurs, is not a public health concern but will affect quality factors such as shelf life and grade.

c. Corrective measures can be verified during the next survey without threatening product safety or wholesomeness.

d. Includes handling, storage, and testing of raw and finished products.

e. Slight deficiencies in the facilities or housekeeping.

5. Category - E (Classification - Environmental).

Category E deficiencies are offered for the benefit of the plant so they can correct these small areas before they become problems. They are of such minor importance that they will not affect plant status.

Examples:

a. Unsatisfactory conditions or practices noted at a level that do not affect product quality, wholesomeness, or safety unless corrective measures are delayed for a long period and the deterioration increases.

b. Conditions inside and outside the plant that do not directly affect product quality or endanger product wholesomeness.

c. Physical condition of equipment items that does not directly affect product quality or endanger product wholesomeness.

d. Very slight deficiencies in the facilities or housekeeping.

6. Differentiation of classification levels.

Some deficiencies are similar in wording, but are distinguishable in classification. The inspector will need to use good judgment that is based on these guidelines and instructions to assign each deficiency to the appropriate category.

Examples:

Bristles, gasket parts, etc., but no product residue, in a raw milk cooling press—D
vs.
Bristles, gasket parts, etc., but no product residue, in a cheese milk cooling press—C

Slight film present on the exterior of equipment—E
vs.
Slight film present on the interior of equipment after CIP—D

Product and CIP lines separated by an improper block and bleed system (block-block-bleed, one valve seat not present, etc.)—C
vs.
A CIP line connected directly into a product line or storage tank during operation with no intervening valves—B
vs.
CIP solution entering product during production—A

F. Prepare Recommendations for Deficiencies Noted During the Survey.

Very minor items can be handled verbally. Preferably, the recommendations should be written during or immediately after the survey and one copy left with management after your discussion. Written documentation of deficiencies is required when the survey results in the INELIGIBLE status assignment so management is clearly informed about needed corrective measures (see Section IV).

Use the Item number to identify each recommendation. Write recommendations in a concise, positive manner, using complete sentence structure. Use wording that will indicate the nature of the deficiency as well as the needed corrective measure. Be specific when making recommendations. Make sure the exact equipment or area is identified in each recommendation. In some instances, it may be necessary to show the nature of the deficiency separately. If so, insert a brief explanation in parentheses directly after the applicable recommendation. Also, record the category of each deficiency in parentheses directly after the recommendation. When the recommendations will not easily fit on a single page, show the balance on a lined insert page (tablet paper). Number each page or show on the bottom

"Continued on next page." Recommendations carried forward should be fully identified, such as B41, C54, etc.

Examples:

A1. — Repair the two rusted out floor drains near the can washer (D).

A28. Silo 1 - Improve CIP of the lower half of the silo (slight blue film noted) (D).

Silo 2 - Polish the slightly pitted sample spigot (D).

Silo 3 and 5 - In use.

Silo 4 - Satisfactory.

B10. — Remove agitators from cream tanks 2 and 3 for manual cleaning each time the tanks are washed (slight product present) (C).

C46. — Discontinue the practice of reusing single service type cheese press cloths (C).

If more than one deficiency is noted for an item, list each recommendation separately.

Example:

A12. — Polish the pitted impeller, back plate, and housing of the west receiving pump (D).

— Remove the receiving hose end stubs for daily hand cleaning (slight product residue present) (D).

Some items or pieces of equipment may have multiple deficiencies, each belonging in a different category. If this is the case, list each of these deficiencies in the "Recommendations" section. Then determine the overall category for the item. Special emphasis should be placed on the deficiency that falls into the most serious category when making this decision.

Example: (Category D)

C24. — Improve cleaning of the tables (slight film on exterior of vats 1 and 5) (E).

— Continue to polish the rough welds in the drain grates of all the vats (D).

(Category C)

C24. — Improve cleaning of the tables (slight film on interior of vats 1 and 5) (D).

— Continue to polish the rough welds in the drain grates of all the vats (D).

— Improve cleaning of the outlet valves of tables 1, 2, and 5 (slight product noted on valve seats) (C).

G. During the Course of the Survey, Note What Corrective Action Has Been Taken on Previous Survey Recommendations.

List such items under a new heading, “Improvements” to be shown on the last page of the survey report. Number the improvements serially (cross referencing to the previous survey recommendation number is not necessary). This list should include major improvements accomplished by the plant even though they were not recommended, such as expansion of the bulk milk receiving facilities, construction of a new warehouse, installation of new separators, etc.

Do not show future company plans or projections as improvements. It is well to acknowledge management intent, but this should be done under an appropriate subheading or preferably in a parenthetical sentence located after the applicable recommendation.

H. Submit Reports Promptly to the National Field Office.

This will facilitate prompt distribution to management from the office.

Whenever possible, a longhand copy of the report should be left with the plant manager following the summary discussion. When a copy of the report cannot be left due to time constraints, a list of the most serious deficiencies and your recommended status assignment should be left. Advise management that your status recommendation is subject to change through supervisory review at the National Field Office. Therefore, the official report should be carefully reviewed when it arrives at the plant.

III. Assignment of Plant Status

A. Determination of Plant Status Is the Responsibility of the National Field Director or a Delegated Assistant.

A USDA approved plant is one that satisfactorily meets the requirements of the *General Specifications*. The plant status is determined by careful review of the inspector's report and evaluation of the extent and category classification of reported deficiencies. The inspector's status recommendation will receive primary consideration. This recommendation will be altered only to correct misinterpretation of inspection requirements or policy and to maintain program uniformity. Of lesser importance, but still factors in status assignment, is the plant survey history of operating conditions, past response on recommendations, and management expressions of intent to correct current deficiencies.

B. A Surveyed Plant or Processing Operation Shall Be Assigned One of the Following Status Designations.

1. FULL STATUS.

The plant satisfactorily meets requirements of the *General Specifications*. If deficiencies exist, they are of relatively minor significance. None of these deficiencies are classified as category A, B or C.

2. APPROVED 6-MONTHS.

The plant has deficiencies which disqualify it for FULL STATUS. The nature of these deficiencies is such that they do not directly affect the wholesomeness or quality of the finished product. None of these deficiencies are classified as category A or B.

3. APPROVED 3-MONTHS.

The plant has deficiencies which disqualify it for FULL STATUS or APPROVED 6-MONTHS status and that could have an adverse effect on product quality, however, the plant has no category A deficiencies.

The APPROVED 3-MONTHS status should be assigned on the first survey after PROBATIONARY 10-DAYS or INELIGIBLE status assignments (see Section III, Item C). It shall also

be the highest status assigned after an initial survey, provided the plant meets the requirements of the *General Specifications*.

USDA is particularly concerned with instances where conditions observed during a plant inspection following the assignment of the APPROVED 3-MONTHS status would warrant consideration of another APPROVED 3-MONTHS status. Consecutive APPROVED 3-MONTHS status assignments can be made only when all the following criteria are met:

a. Significant progress has been made in correcting deficiencies noted on the previous survey.

b. Plant sanitation, when considered separately, would be equal to that found in an APPROVED 6-MONTHS plant.

c. Equipment construction deficiencies are such that product quality is not materially affected.

d. Facility deficiencies are such that product quality is not materially affected.

e. Plant management supplies a written commitment which is confirmed in the survey report, that the relevant facility or equipment deficiencies will be corrected within a period of time acceptable to the USDA.

f. The arrangement is approved by the National Field Director.

In the event that all of the above conditions are not satisfied, the PROBATIONARY 10-DAYS or the INELIGIBLE status shall be assigned.

4. PROBATIONARY 10-DAYS.

When very serious deficiencies are observed that, if not corrected immediately, would result in the INELIGIBLE status being assigned, but management assures prompt attention to the primary deficiencies, consideration may be given to an alternative status of PROBATIONARY 10-DAYS under the following circumstances:

a. The main deficiencies are of such character and extent that correction can be made essentially immediately.

b. Plant management intends to make corrections immediately.

c. The arrangement is approved by the National Field Director.

To obtain approval for the PROBATIONARY 10-DAYS status, inform the National Field Director by telephone about the main deficiencies noted during the survey. After familiarization with the situation, the National Field Director may ask to speak with the plant management and learn

of their corrective plans. The National Field Director may or may not approve the request. If approved, inform the plant manager that a resurvey will be preformed in approximately 10 days. In the event you are unable to contact the National Field Office when a question comes up about the PROBATIONARY 10-DAYS status, assign the INELIGIBLE status and tell the plant manager you will contact the National Field Director the next business day.

5. INELIGIBLE.

The plant has serious deficiencies (any category A deficiency) which may affect product wholesomeness, safety, or quality. This status assignment is also applicable when raw material source plants are not approved or when no significant improvement has been made in plant operations since the previous survey at which time an APPROVED 3-MONTHS or PROBATIONARY 10-DAYS had been assigned.

When the plant conditions are such that you recommend the INELIGIBLE status, advise the plant manager and leave written notification of the INELIGIBLE status, codes affected, date of action, and recommendations for needed corrective measures. The National Field Office shall also be notified promptly by telephone.

Assign the INELIGIBLE status if a plant decides to drop a product code and the equipment will not be included in future surveys.

Products made by plants with the INELIGIBLE status shall not be officially graded or inspected. Assistance with plant upgrading or resurvey for reinstatement is available upon request. When a plant is either rated INELIGIBLE or reinstated for grading service eligibility, the National Field Director will also notify the field personnel about the status action if it involves products likely to be presented for grading (product in a warehouse but not yet offered for grading when a plant is assigned the INELIGIBLE status is not eligible for official grading or inspection).

6. NO STATUS ASSIGNED.

There are instances of inspection activity where assignment of a plant status is not applicable. In the following instances the NO STATUS ASSIGNED designation should be used:

a. After an initial survey in which the plant did not meet the requirements of the *General Specifications*.

b. Management requests a survey of a portion of the plant that was not included in previous surveys and that does not meet the requirements of the *General Specifications*.

c. A plant decides to change or eliminate one or more product codes and all the equipment remains included in the survey. For example; a plant producing NDM and Dry Whey on the same dryer decides to stop drying the whey and ship it as condensed whey. They retain the NDM code, add the Condensed Whey code and

receive NO STATUS ASSIGNED for Dry Whey. Note: If the plant had dropped all dry codes the INELIGIBLE status would apply because the dryer would no longer be included in the survey.

d. Management requests a review of operations under construction in order to learn what changes are needed to meet the requirements.

C. Plant with Previous Serious Deficiencies.

In general, when a plant has deficiencies serious enough to warrant the INELIGIBLE or PROBATIONARY 10-DAYS rating, the status assigned on the subsequent survey should not be higher than the APPROVED 3-MONTHS designation. Such a plant has had a serious problem and closer surveillance is necessary for assurance that corrections were adequate and operations are satisfactory on a continuing basis.

There may be exceptions to this general policy when the reinstating survey clearly reveals not only correction of the deficiency, but also correction of the underlying causes. In such instances, status higher than APPROVED 3-MONTHS may be assigned as applicable.

Examples:

a. A cheese factory was rated INELIGIBLE because of mold growth on walls and ceiling of the make room. Previous survey reports show a history of mold trouble in this room during winter months. The reinspection reveals mold free plant conditions, repainting of the make room, insulation of the walls and ceiling, and installation of additional space heaters for improved air circulation in the room. The insulation and ventilation improvements should preclude further mold problems so status on the reinstatement survey may be higher than APPROVED 3-MONTHS if warranted by other plant conditions.

b. High DMCC results have caused INELIGIBLE plant status. When a subsequent survey or special sampling for DMC tests shows satisfactory results, the appropriate plant status may be directly assigned.

D. Plant Status Assignment Factors and Considerations.

The plant status assignment may be based on one major item, many minor items, or a combination of both. Reported deficiencies are evaluated in terms of their relationship to public health, product wholesomeness, product quality, and sanitary conditions of production. In accordance with the provisions listed in Section 58.124 of the *General Specifications*, notwithstanding other requirements for plant approval, the following policies apply for the specific items listed below to promote uniformity in assigning plant status:

Equipment Sanitation.

Unsatisfactory sanitation of equipment, depending on the seriousness and extent of the deficiency, may be categorized as A, B, C, D, or E according to Section II, Item E and the following guidelines.

1. Category A.

Widespread, definite product buildup on multiple product contact surfaces of a major piece of equipment or system resulting from neglected or inadequate cleaning.

Examples:

a. Plugged evaporator tubes (unless cleaned during the survey).

b. Unclean equipment caused by a CIP line that was plugged for more than one cleaning cycle.

2. Category B.

Incomplete cleanup leaving definite product residue on a product contact surface of a piece of equipment, or a deficiency that would be classified as category A except it is on the raw product side.

Examples:

a. A plugged sprayball that has left a definite product residue on a product contact surface.

b. A raw milk silo that was sucked in and does not clean properly.

3. Category C.

Slight product on product contact surfaces of equipment, or a deficiency that would be classified as category B except it is on the raw product side.

Examples:

a. Slight product residue on an outlet valve.

b. A plugged sprayball that has left a slight product residue on a product contact surface.

4. Category D.

Definite film on product contact surfaces, slight product residue outside the product zone, or a deficiency that would be classified as category C except it is on the raw product side.

Examples:

a. A slight product residue on a pump seal.

b. Blue or white film on tank interiors.

c. Slight curd remnants on a knife in an enclosed cheese vat.

5. Category E.

Films or very slight product on the exterior of equipment.

Examples:

a. A slight product residue on the exterior of a product storage tank.

b. Blue or white film on the exterior of a cheese vat.

Product or Product Contact Surface Contamination.

1. Category A.

It shall be considered a category A deficiency when the survey reveals conditions whereby the product has been contaminated by foreign materials. Such conditions could be related to building deficiencies, unsatisfactory equipment, or operation practices.

Examples:

a. A serious condensation problem on the ceiling or overhead pipelines that drips onto cheese in a vat.

b. A leaky roof in a processing area, or dust, dirt, or paint chips on the ceiling that are observed falling on exposed product.

c. Equipment leaks, which allow nonpotable water or other nonfood fluids to mix with the product.

d. Unsanitary handling or production practices that contaminates the product.

2. Category B.

It shall be considered a category B deficiency when the survey reveals conditions whereby product contact surfaces (but not product) have been or may become contaminated by foreign materials. Such conditions could be related to building deficiencies, unsatisfactory equipment, or operation practices.

Examples:

a. A serious condensation problem on the ceiling or overhead pipelines that drips into an empty cheese vat.

b. A leaky roof outside the processing area, or dust, dirt, or paint chips on the ceiling that can fall on exposed product.

3. Other Categories.

Observed contamination of product or product contact surfaces shall be either a category A or a category B deficiency. Other categories are not applicable to these deficiencies.

Processing Unwholesome Products.

It shall be considered a category A deficiency when the survey reveals conditions whereby unwholesome raw products are processed, or added to products, processed for human consumption. When the plant desires only "P" code approval, source plants for dairy ingredients need not be USDA approved. However, in any instance where products that have been rendered unwholesome are utilized for human food, regardless of the source of the products, the "P" code approval shall be denied and the INELIGIBLE status assigned.

Examples:

a. Floor scrapings from either butter packaging or cheese cutting operations being utilized for butter, butteroil, or process cheese production.

b. Reprocessing for human food of contaminated product containing grease, dirt, filth, or insects.

c. Use of moldy butter or bulk cheese for further processing without prior cleaning.

d. Use of salt contaminated with foreign material.

Manufacturing and packaging operations of butter and cheese often result in a certain amount of "scrap" such as butter or cheese that has seeped from forming heads or adheres to cutting frames, which has not been contaminated with unwholesome substances. This product can be reclaimed for human food and shall be clearly identified as (butter or cheese) for

Reprocessing for Human Consumption (or words to that effect). Scrap that has been contaminated, comes in contact with floors, or has been removed during bulk product cleaning operations cannot be reclaimed for human consumption and shall be labeled “Fish bait,” “Waste,” or “Inedible Scrap” (or words to that effect) and “Not for Human Consumption” (see DA Instruction 918-I Section F).

Other Concerns Affecting Plant Status.

There are numerous other deficiencies which also affect status when considered singly or in combination. These items can be found in the guidelines of in Section V.

E. Supervisory Review and Distribution of Report.

In connection with the supervisory review of the survey report to determine status, it is also the reviewers’ responsibility to check the report comments and recommendations for clarity and conformity to USDA policy. When necessary, changes should be made. Major changes should also be brought to the attention of the inspector and the inspectors immediate supervisor to promote proper preparation of future reports.

Each survey report should be transmitted with a letter that present status information and outlines DMC, Salmonella, and Alternate Fats test results, when applicable.

Distribute the official report and accompanying transmittal letter as follows:

- Original to the National Field Office.
- One copy to plant manager.
- One copy to another interested party designated by the manager or to the applicant in those instances when the plant is not the applicant.
- One copy to the cooperating state agency.
- One copy to the Branch Chief in Washington.
- One copy to the inspector.

IV. Discussion of the Survey with Plant Management

A. Exit Interview.

Upon completion, discuss the survey with the plant management and any plant personnel the manager wishes to have present. Go into the meeting properly prepared to clearly present your observations and recommendations, and the reasons for them. To facilitate this review the preliminary copy of the report should be completed before beginning the exit interview. Allow the plant management to make as many copies of the report as they wish. This discussion with management is an important part of the plant survey.

Take the time to discuss each of your recommendations and the plant conditions which caused you to make them. During the discussion, stress any "repeat" recommendations and those which concern sanitation, wholesomeness, product quality, etc. These recommendations can be "flagged" with asterisks (*) or an up arrow (↑) up on the report. "Flags" can also be used for recommendations that, in your opinion, should move up a category on next survey if corrections have not been made. If "flags" are used stress the fact that the USDA considers all the recommendations in category D and above to be important and expects that progress will be made in addressing them all.

Management intentions or commitments for correction of serious deficiencies in the facilities or equipment should be presented in writing and reported to the National Field Office for consideration when assigning these deficiencies to a category. Attach the letter to the report if it is available, otherwise have the plant manager mail it to the National Field Office.

Review the plant's product codes with management to determine if updating is required or any changes are requested. Product codes can be added if the appropriate equipment was included in the survey. Product codes that are deleted shall be listed on the survey report as INELIGIBLE or NO STATUS ASSIGNED (see Section III, item B).

Review recent improvements and inquire if your listing is complete. Report follow-up on previous survey recommendations and acknowledge any other major upgrading, such as new construction, new equipment, etc.

A copy of the preliminary report should be left with the plant manager following the exit interview. On the occasional instance where scheduling requires you to leave, notify the National Field Office so the mailing of the completed report can be facilitated. Written notification shall be left with the plants management when recommending assignment of the INELIGIBLE status. If this status assignment is the result of a cursory inspection (in conjunction

with salmonella sampling, processing lines, etc.) the Cover page and Page Z should be left detailing the conditions at the plant and the status assignment. If the survey Pages are not available, a memo shall be left. This memo shall include:

1. The date.

2. The name of the plant.

3. The plant number.

4. A description of the deficiencies that resulted in the INELIGIBLE status.

5. The grader's signature.

Following this procedure should eliminate any confusion or misunderstanding between USDA and the plant.

Advise management that your recommendations are subject to change through supervisory review at the National Field Office. Therefore, the official report should be carefully reviewed when it arrives at the plant.

B. Plant Status Recommendation.

Every survey report shall have the inspector's recommendation for status as determined by the number of deficiencies listed in the status recommendation worksheet. Advise the manager about your recommendation, but emphasize that the determination may be altered by the National Field Director or a delegated assistant. The Director's decision will be reflected in the transmittal letter for the reviewed, official report.

V. Guidelines for Performing Plant Inspections

Page A. Inspection of Raw Product Receiving, Storage, and Quality Program. (Form DA - 151 - 1)

Especially detailed guidelines are shown for Items 1 through 15 and Items 24 through 40. These particular inspection factors are cross referenced instead of repeating the information on other survey pages.

Receiving—Cans

Item A1—Room Construction (58.126, 58.131).

Rooms or areas for receiving can milk shall be separated from the processing rooms by a solid partition or by suitable arrangement of equipment with enough distance between receiving and processing operations to avoid possible contamination of milk or dairy products during manufacturing and handling.

Check the can inlet and outlet openings for effective protection against entrance of flies or rodents. If possible, inspect the openings when conveyor lines are idle to determine if self-closing doors fit tightly. Some older installations have doors that do not effectively block off open areas beneath the conveyor chain. If this is the case, recommend modification or replacement to obtain effective rodent protection.

Fly fans, fly tunnels, streamers, or other devices may be used to prevent entrance of flies in this area. The adequacy of the method used can be evaluated by noting if flies are present in the room. When flies or other insects are noted, refer to the guidelines for Item A37–Pest Control in reporting deficiencies and recommended corrections.

Toilet rooms shall not open directly into any room in which milk or dairy products are processed, packaged or stored. One way to correct this is to add a vestibule with an additional self-closing door.

A. Floors (58.126c).

The floors of all rooms in which milk or dairy products are processed, manufactured, packaged or stored or in which utensils are washed shall be constructed of tiles properly laid with impervious joint material, concrete, seamless epoxy, or other equally impervious material. The floors shall be smooth, kept in good repair, graded so that there will be no pools of standing water or milk products.

Examine the floor for slope, condition, and cleanliness, noting cracks, broken or eroded concrete, missing grouting, poor drainage, or general deterioration. Recommend repair or replacement as may be applicable based on the condition.

Loose floor tiles or loose floor topping materials are especially serious conditions. Water and other liquid wastes can seep underneath (floating floors) and create areas of insect or bacterial harborage and bad odors. If noted, recommend correction.

B. Floor Drains (58.126c).

Floor drains should be so located and sized so that the normal volume of liquid waste is promptly carried away.

Properly trapped floor drains are essential to prevent possible off odors and contamination of plant air. Drains shall be kept clean and be individually protected with an effective trap. A central trapping system without individual drain traps is unsatisfactory because odors and airborne contamination could originate from sewer pipes located between untrapped drains. Trench drains that are often found in receiving rooms are acceptable provided they are trapped at the outlet.

Bell and standpipe type traps in good condition will meet minimum USDA requirements, however, they require much maintenance. Therefore, check that standpipes are of proper length and that bells are in good condition and properly attached. Recommend replacement of any broken bells or drain covers. When broken or corroded standpipes are noted, recommend replacement with a “U” or “P” type trap.

U or P traps can be discerned by the water level in the drain pipe and need only to be inspected for cleanliness.

All new construction shall be equipped with U or P type traps unless specifically authorized by the Dairy Grading Branch.

Floor drain covers should be removable to permit cleaning of the drain area as needed. Welding covers in place is not satisfactory. If covers or drains in processing rooms are dirty, recommend more frequent cleaning.

Drains from elevated metal work decks for fluid product storage or processing operations should have traps located as close as practical to the deck drain and the drain pipes should be directly connected into the sanitary sewer system. Such traps and sewer connections are necessary to conduct fluid floor wastes out of the plant in a sanitary manner. It is unsatisfactory if deck drains are untrapped or the drain pipes discharge to the floor below. However, do not criticize lack of drain traps or sewer connections for the following types of decks:

1. Low platforms or decks with short straight drain pipes that can be easily cleaned. Example: Milk graders or dumpers platforms in can receiving rooms. If such pipes are causing off-odors, recommend cleaning.

2. Decks in nonproduct areas that are usually maintained in dry condition and seldom require wet cleaning. Examples: Steel decks around drier fans or secondary collectors, etc.

3. Decks in product processing areas that are normally free of fluid product wastes (e.g., operating decks for some evaporators, which are usually wetted only with water or cleaning solutions).

Drain pits or sumps for the sanitary sewer system that are located within the plant shall have tight fitting covers to prevent escape of odors. Covers may be gasketed, set in a bed of caulking material, or otherwise sealed to the opening with appropriate fastening devices. Recommend corrections where needed.

Processing rooms for margarine and butteroil and packaging rooms for margarine, butteroil, and butter are often required to have a grease trap by plumbing codes or municipal sewage-related regulations. The grease trap usually consists of a covered masonry pit to which the floor wastes are piped direct. The outlet piping from the pit is trapped and is so designed to keep a water level in the pit. The fat rises to the top and must be cleaned out periodically. This type of grease pit may serve instead of individual drain traps for the rooms listed above, subject to the following requirements:

1. Preferably the pit should be outdoors. However, if located inside the plant, the pit shall have a tight fitting cover and the required periodic cleaning shall not be conducted while processing operations are underway. If the pit location inside the plant is near processing operations or if unsanitary conditions are caused by the cleaning operations, recommend relocation outside the plant.

2. The drain lines shall enter the pit below the normal water level–thereby providing a seal against air flow from the pit to the processing room.

3. The outlet line from the pit to the sewer shall be trapped as close as practical to the pit.

When these requirements are met, the drain system should be shown as satisfactory on the report.

When floor drains are in a little-used area, water may evaporate from the trap, causing it to lose its “seal.” For such drains, recommend a nonevaporating type liquid (mineral oil, ethylene glycol) be added to prevent evaporating, or a plug or cap can be used to maintain an effective seal.

C. Walls, Partitions, Posts, & Ceilings (58.126a, b).

Inspect these surfaces for condition and cleanliness. Make recommendations as may be applicable for unsatisfactory conditions such as peeling paint, needed repairs, unsanitary conditions, or unsealed permeable surfaces, etc. These surfaces should be light colored and impervious to allow for easy cleaning.

For new construction, recommend provision of a rounded cove at the juncture of wall and floor (a "should" item; coving is desirable for easier cleaning, but is not required for new plant approval).

So called "dropped ceilings" are satisfactory in office space, laboratories, and similar areas without particular inspection concern about the materials or construction. However, when processing rooms have such ceilings, check for the following:

1. Support rails free of rust or peeling paint (they are often made of aluminum or have special coatings to prevent corrosion).

2. Panels are removable to allow inspection of the false area above. Alternatively, the ceiling may be strongly supported and the enclosed area is deep enough to permit access on catwalks for inspection purposes, changing light bulbs, etc.

3. Ceiling panels are smoothly finished with a suitable material of light color, impervious to moisture, and kept clean.

4. Edges of panels are also finished or sealed to prevent absorption and so that loose fibers do not fall into the room.

When deficiencies are noted regarding these items, recommend correction. Also, review the guidelines for Item A37–Pest Control.

Certain kinds of perforated ceiling panels are sometimes used for their acoustical qualities. This type of ceiling should be discouraged because the perforations are not desirable from a sanitary standpoint. However, if they are specially coated or enveloped to permit cleaning when they become dirty, are in good condition, and are clean, show as satisfactory. If in damaged or dirty condition, recommend cleaning or replacement of the unsatisfactory panels.

D. Doors & Windows (58.126a).

§58.126a requires that all outer doors shall effectively protect against the entrance of flies and other insects, rodents, birds, dust and dirt. Therefore, doors and windows shall be adequately screened and fit properly. Exterior screen doors shall open outward.

Strip curtains alone cannot provide the protection necessary to serve as exterior doors. They are better suited for slowing air flow through interior doors or passageways. When strip

curtains are being used as exterior doors, recommend that they be replaced with a properly fitting, solid door and limit the plant status to APPROVED 3-MONTHS (category B deficiency). If the strip curtain door has not been replaced by the next inspection, the INELIGIBLE status will apply (category A deficiency). In addition, if only strip curtains are used between a processing or packaging room and other rooms in the plant, recommend a solid door be provided, and assign this deficiency to category D.

Wood or iron frame windows are satisfactory if in good condition. However, when noted with peeling paint, deteriorated frames, missing putty, etc., recommend needed repairs or replacement. Elimination of windows is also a satisfactory alternative if adequate ventilation and lighting is provided by artificial means.

Check that windows, glass partitions, and skylights are washed as often as necessary to keep them clean and that cracked or broken glass is replaced promptly.

E. Category Assignments.

To ensure uniform category assignments for deficiencies concerning room construction the following guidelines will apply.

1. Category A deficiencies:

    a. Peeling paint, rust, insulation fibers or other extraneous material noted on or in the product.

    b. A roof leak in a processing room that is contaminating product.

    c. Sewage backup into a processing, packaging, or product storage rooms.

2. Category B deficiencies:

    a. Peeling paint, loose rust, frayed pipe insulation, etc. directly above product or product contact surfaces but not observed on or in product.

    b. Peeling paint noted in a CIP tank.

    c. Paint chips or other extraneous material noted on cheese or butter, or on the conveyor to a grinder or microfix, provided that it is cleaned before further processing.

    d. Floating floors (if noted on the last survey and the condition has deteriorated).

    e. A roof leak in a processing or storage area (may be category A, depending on severity).

3. Category C deficiencies:

    a. Peeling paint, loose rust, frayed pipe insulation, etc. directly above product or product contact surfaces that have a cover, provided the cover is in place during the survey.

    b. Peeling paint, loose rust, frayed pipe insulation, etc. directly above uncovered CIP tanks.

    c. A roof leak outside the processing or storage areas.

    d. Most floating floors.

4. Category D deficiencies:

    a. Peeling paint, loose rust, frayed pipe insulation, etc. in a storage area, provided all gaskets and packaging supplies are covered.

    b. Peeling paint, loose rust, frayed pipe insulation, etc. directly above CIP tanks that have a cover, provided the cover is in place during the survey.

    c. Rough floors in a processing room.

    d. Floating floor under CIP tanks, in a CIP room, or other nonprocessing areas of the plant

Item A2—Lighting & Ventilation (58.126d, e).

A. Lighting (58.126d).

The General Specifications require at least 50 foot candles (F/C) of light intensity where dairy products are graded or examined for condition and quality, and 30 F/C at working surfaces in rooms for manufacturing, processing, or packaging dairy products or washing of equipment and utensils. In all other rooms, including storage rooms and coolers, light intensity shall be at least 5 F/C when measured at a distance of 30 inches from the floor.

Use a light meter to check light intensity. Judgement is needed in taking and reporting meter readings. Check that the lighting is ample and well distributed. The need is greatest where processing, packaging, cleaning, and inspection activities are taking place and these areas should receive primary attention.

50 F/C of light is needed in a can milk receiving room dumping area where milk is graded.

Encourage the provision of at least 30 F/C light intensity in rest rooms and locker rooms (a “should” item of §58.126d). When lighting is deficient, recommend improvement.

When contamination of product by broken glass is possible, light bulbs and fluorescent tubes shall be protected against breakage. Light fixture protectors help prevent accidental breakage of the relatively fragile bulbs and also prevent the spread of glass particles in the event of spontaneous breakage. Check for such protection for any light fixtures that are located so that bulb breakage could cause product contamination. With this approach it is conceivable that the fixtures on one side of a processing room might require protectors while those on the other side do not, and this would meet USDA requirements. In actual practice, however, many plants prefer to install protectors on all light fixtures in processing areas. This permits shifting of equipment and processes without special concern for adequacy of light protectors.

Incandescent bulbs may be satisfactorily protected with heat resistant plastic or other acceptable shields. Some incandescent bulbs are termed “unbreakable” because of plastic coatings or imbedded translucent fibers in the glass (“Tufskin” for example). Special protection against breakage is not necessary for such bulbs. However, be sure to check for adequacy of light level where they are used.

Fluorescent tubes are usually protected by transparent plastic enclosures on the bottom side of the light fixture. These shall be maintained clean and be free of debris. Alternately, round plastic tubes that slip over the individual fluorescent tubes can be used. Either type is satisfactory. If the latter type is used, make sure that the protective tube has end caps that hold the tubes in place in the event of breakage of the fluorescent tube. Another satisfactory protection method involves transparent resin or plastic coating of each tube to prevent escape of glass particles in case of breakage.

Mercury or sodium vapor type lighting fixtures are satisfactorily protected by their usual construction inside heavy glass reflective enclosures.

B. Ventilation (126d, e).

Adequate ventilation shall be provided to control room temperature, objectionable odors, humidity, and condensation. Inlet fans shall be provided with effective screens or filters to prevent the entrance of insects. Exhaust fans shall be screened or provided with self-closing louvers to prevent insect entrance. Persistent, strong odors in processing areas may indicate the lack of adequate ventilation, recommend that ventilation be improved.

Ventilation of toilet rooms shall be provided by mechanical means to the outer air (an exhaust fan). When there is no mechanical ventilation, recommend correction. (It is management option whether the exhaust fan is wired to operate from the room light switch, a thermostat, or a manual switch.)

Visible mold growth in areas where dairy products or packaging materials are exposed shall be considered a category A deficiency. This includes areas such as the butter churn room, butter cooler, cheese make room, starter room, cheese cooler, and cheese drying room (except as noted below). The presence of mold in areas remote from exposed finished product and packaging materials should be considered a category C deficiency. This may include areas

such as separate receiving rooms, can wash rooms, engineering space, etc. If the mold is limited and immediately removed during the survey, plant status should not be affected (category E). However, the condition and correction shall be noted on the survey report and recommendations offered to prevent mold recurrence. If mold is noted in the same area on a subsequent survey, indicating the underlying problem has not been corrected, the deficiency should be assigned to category B or C. In plants producing cheese varieties where mold is a recognized attribute of the cheese, minor mold growth on surfaces other than the cheese, but limited to the cheese curing areas shall not affect status (see the guidelines for Item C58–Lighting & Ventilation). Mold in other processing areas shall be handled as required above.

C. Condensation (58.126d, e).

Examine the ceiling and walls for condensation or mold growth. The presence of moisture may indicate poor plant ventilation, inadequate heat, or inadequate insulation, and could lead to mold growth. Such conditions are unsatisfactory and condensation dripping into product or onto product contact surfaces is a serious deficiency.

Some cheese varieties may require high humidity conditions in the curing rooms that may lead to condensation in these rooms. If this is the case, do not criticize the condensation if the cheese is adequately protected from all moisture dripping from unsanitary surfaces.

D. Category Assignments.

To promote uniformity in category assignments, use the following guidelines for lighting and ventilation deficiencies.

1. Category A deficiency:

    a. Condensate dripping from unsanitary or unclean surfaces (such as the ceiling, cast iron pipes, service lines, pipe insulation, etc.) onto product, product contact surfaces, or into a brine tank.

    b. Mold in a processing area (unless cleaned during the survey).

2. Category B deficiency:

    a. Condensate dripping from unsanitary or unclean surfaces (such as the ceiling, cast iron pipes, service lines, pipe insulation, etc.) onto product contact surfaces (provided it is cleaned and sanitized before any product is contaminated).

3. Category C deficiency:

    a. Condensate dripping from clean clamps or other clean stainless steel fittings into product or onto product contact surfaces.

    b. Repeat deficiency; mold in the same area in a processing room (if cleaned during the survey).

    c. Less than 10 F/C of light in the area of a COP tank or where products are graded.

4. Category D deficiency:

    a. Condensate dripping from clean stainless steel pipelines (but not fittings) into product or onto product contact surfaces.

    b. Low lighting on working surfaces.

5. The following items have an insignificant effect on the quality of the product, therefore, no recommendation is required.

    a. Condensate dripping from the bottom of a clean, good condition stacked brine tank into the bottom tank (provided that the exterior of the top tank is constructed to the same specifications as the product contact surfaces of the tanks).

    b. Condensate dripping from a clean surface (such as stainless steel pipes and fittings, a PVC water or brine pipe, drip shields, etc.) into a brine tank.

Item A3—Pump, Pipelines, & Valves (58.128, 58.131d, 58.146a).

A. Weigh & Drop Tanks (58.128d).

Inspect this equipment for condition and cleanliness. Dismantle sufficiently to allow a good evaluation. Check the dumping grid, baffle, screen, weigh tank valve, underside of covers, and the drop tank pump. Recommend correction when any product contact surfaces are found dirty or with broken or open seams. Splash grids shall be made of stainless steel or equally corrosion resistant material. Tinned iron grids (expanded metal) are unsatisfactory because of the difficulty in cleaning.

The weigh tank shall be provided with a cover. Drop tanks or receiving tanks shall be provided with covers if they are subject to splash, condensate, or drippage.

Check for adequate space and facilities for cleaning of the equipment, floor and any adjacent walls in the area. Where necessary to provide easy access, the drop tank shall be equipped with wheels or casters to allow easy removal.

B. Pumps (58.128l).

All centrifugal product pumps shall comply with the *3-A Sanitary Standards for Centrifugal and Positive Rotary pumps for Milk or Milk Products, Number* 02- (see Item A32–CIP System(s) for additional information concerning pumps used to circulate cleaning compounds).

Most pumps can be properly inspected for condition and cleanliness only by complete dismantling. The areas that need special checking for cleanliness are:

1. juncture and gasket between head and pump body,

2. fastening device for impeller(s), (especially if a threaded nut is used),

3. interface of shaft and impeller hole,

4. back plate and seal assembly.

These are the most troublesome points on both positive and centrifugal type pumps. Proper cleaning of all these points usually requires daily dismantling and cleaning by hand brushing or by placing the dismantled parts in a COP tank.

Some newly designed centrifugal pumps have been built to eliminate or successfully clean all the four previously mentioned “trouble spots.” These pumps are similar to the older centrifugal pumps. One exception is that the impeller is bolted to the drive shaft with a cap nut (acorn nut). If these are encountered during the survey, have a representative number dismantled, if these are found to be satisfactory other similar pumps can be inspected by having the face plate removed to inspect it and the impeller for pitting and sanitation. It is not necessary to have all them dismantled further for inspection if the bolt and seal have been properly maintained.

When inspecting a conventional (non-CIP) pump that is not designed for easy dismantling of seal and back plate and the pump is not dismantled for hand cleaning, recommend replacement with a modern sanitary pump. Similarly, recommend replacement of any pump with permanent packing gland type seal. When the basic pump design is satisfactory, but daily dismantling is not performed due to rusted frame parts, damaged threads, lack of proper tools, etc., recommend necessary corrective maintenance or replacement of the pump.

So called “water seal” centrifugal pumps are often used for recirculating product in falling film evaporators, for removing final product from vacuumizers and evaporators, and for similar applications. Some of these pumps simply have provisions for exterior cooling of the shaft seal area with flowing water; some have enclosed water channels to direct the flow of cooling water around the exterior surfaces of the seals. While the primary purpose is to improve the effectiveness and life of the seal, the flowing water also performs a secondary function in washing away any product leakage from the back plate and seal area. The back plate and seal areas are usually quite difficult to take apart. Because of the water flushing of the seal areas,

daily dismantling of these parts for hand brushing is not necessary if the other internal parts of the pump are constructed to permit satisfactory cleaning in place. However, if for instance, the impeller is fastened to a splined or keyed shaft with a threaded nut, there is no satisfactory alternative to daily dismantling as far as the back plate and seal for hand brushing of internal parts. Also, the water used shall be potable and should go to the drain. If this water is reclaimed for use in products assign the deficiency to category A unless the practice is discontinued.

Pumps made of “optional metal alloys” (sometimes referred to as “stainless metal,” or “dairy metal”) are not acceptable and are not grandfathered. Recommend replacement with a pump that complies with the current 3-A Sanitary Standards and assign the deficiency to Category C.

Pumps should be mounted in accordance with the 3-A Sanitary Standards. Use of bricks, wood, etc., to prop up pumps or other equipment should be criticized.

C. Pipelines & Fittings (58.128a, o).

Use a flashlight to check sufficient sections of pipelines to determine acceptable fabrication and cleanliness. Also, check pipeline fittings for construction, sanitation and condition of gaskets.

When conventional bevel seat pipelines are taken down and manually cleaned daily check that satisfactory facilities are provided. Minimum facilities would be a long wash tank (preferably long enough to hold the longest pipe section), either powered or manual type brushes in good condition and of proper length, adequate hot and cold water, and cleaning compounds. Such facilities should be conveniently placed. Where considerable distances are involved, duplicate facilities may be required at additional points in the plant. If any areas are not accessible for inspection, for example “double bends” (⊓⊓), recommend correction.

Pipelines may be cleaned in place without disassembly when they are engineered and installed according to the *3-A Accepted Practices for Permanently Installed Sanitary Product Pipelines and Cleaning Systems, Number 605-* . Become familiar with these 3-A requirements and report any necessary recommendations about the CIP system under Item A32–CIP System(s). Use this item to cover any deficiencies with the condition or sanitation of the pipelines.

Pasteurized product pipelines shall be properly separated from raw product and CIP pipelines according to the following guidelines.

1. There shall be a physical break between pasteurized products pipelines and raw products pipelines.

2. There shall be complete separation between the product pipelines or tanks and the CIP pipelines that contain cleaners or sanitizers.

3. Pasteurized dairy products and pasteurized nondairy products may be separated by a single valve.

Block-and-bleed systems can be used to provide complete separation between product lines (or tanks) and CIP lines (or tanks).

The requirements of block-and-bleed systems used to separate product lines and tanks from CIP lines is valve seat–opening to the atmosphere–valve seat (block-bleed-block). Sometimes the arrangement is valve seat–valve seat–opening to atmosphere (block-block-bleed), which is not acceptable.

Deficiencies in this area may be found in the piping of some cheese vat installations. Although there are many block-and-bleed arrangements, a vent is usually required between each vat. Carefully follow the lines to determine the location of the block-and-bleed valves. Note that sometimes the valves and the vent are spaced quite a distance apart. Also, carefully check the CIP lines. On some vats the CIP lines contain two valves, but not the required opening to atmosphere between them. If you have any questions about a particular arrangement, call the National Field Office.

When deficiencies are noted, recommend a proper block-and-bleed system or physically disconnecting the lines. Deficiencies concerning the block-and-bleed system should be assigned to category C.

Some double seat valves (also called mix-proof valves) can be used for this purpose. These valves contain two valve seats, which operate independently, with an opening to the atmosphere between them (block-bleed-block within one valve body). These are not flow diversion valves (where both seats are attached to the same stem and move together). Some requirements for mix-proof valves to be acceptable are: a full line size opening to the atmosphere between the valve seats (some have a smaller opening, which is not acceptable): both valve seats must be position detectable: and no manual overrides in the system.

If you encounter these valves during a survey, ask to have one dismantled and check the valve seats for cleanup (a separate CIP cycle, after the tanks and lines are washed, is required to clean the valve seats).

Block and bleed systems cannot be used to separate raw products (dairy, non-dairy, or water) from pasteurized milk or milk products. Also, block and bleed systems cannot be used to separate product lines (raw or pasteurized) from lines carrying concentrated chemicals used to make-up CIP and sanitizer solutions. In these circumstances a complete physical break is required.

Inspect the sanitary piping systems carefully for dead ends, which are unsatisfactory because they; 1) trap products during the processing run, 2) present a cleaning problem, 3) allow product warmup (or cooling) in “dead ” area to permit bacteria growth in the trapped product, and 4) allow collection of cleaning compounds that may adulterate the product. Recommend elimination of such dead end conditions. Also recommend use of elbows for making tubing

direction turns rather than capped tees. Proper choice of valve types, location of valves, and insulation are also important to avoid dead end conditions. This does not preclude the use of short couplings to valves or the short pockets formed by hookups using standard “3-A” dairy fittings. Such short pockets are probably not significant if fluid turbulence is sufficient to mix and move the product continuously. Dead ends shall not exceed two times the pipe diameter or five inches, whichever is shorter.

Bypass piping should also be carefully evaluated. There is nothing wrong with bypass piping provided there is some continuous flow through it during processing operations. If valved off completely, however, such piping will form a serious dead end condition. Also check bypass piping carefully for sanitation as it is often neglected.

Standpipes are sometimes installed in sanitary pipelines to absorb shocks caused by rapid surges in fluid product pressure. Air trapped in the standpipes acts as a cushion by being compressed to a smaller volume. However, the fluid product also rises at least part way up the stand-pipe and may be trapped in a dead end condition for long periods, causing serious bacteria contamination problems. Of course the problem is minimized if the product temperature is either cold or very hot. If possible, standpipes should be eliminated. If the pressure surges cannot be remedied, and a fluid damper effect is essential, be sure to check for proper cleaning of standpipes. Daily dismantling and hand brushing is usually required.

In general, product piping within the plant shall be rigid type stainless steel or glass. Flexible hose that complies with the 3-A requirements (such as tygon) may have a few satisfactory in plant applications, for instance to isolate equipment vibration, to make special angled connections, temporary hookups, etc. However, such uses should be limited. When unnecessary flexible hose applications are noted, recommend replacement with stainless steel piping.

When clamps are used to connect flexible hose to pipe stubs, the clamps should permit easy dismantling for daily cleaning of hose and stubs. Screwdriver-type clamps would constitute minimum compliance in this regard, although adjustable toggle type clamps are preferable. If product buildup is noted between the hose and the stub end recommend providing hose assemblies that comply with the *3-A Sanitary Standards for Hose Assemblies for Milk and Milk Products, Number 62- .*

The use of insulation on milk and milk product pipelines is acceptable provided the following requirements are met:

1. The insulation shall not be installed over any gasketed elbows, tees, or other pipeline or instrument fittings. Also, it shall not be installed over any pipeline valves, whether or not the valve is gasketed or is welded in place.

2. About 6 inches of uninsulated space shall be provided on each side of a valve or gasketed pipeline fitting.

3. The cut edges of the insulation shall be covered and sealed to the pipe so that the insulation is protected from water, product, or cleaning solutions.

4. The cover material shall be smooth and cleanable. All cover joints or seams shall be sealed.

5. Insulation shall be restricted to product pipelines that are cleaned in place.

D. Valves & Special Fittings (58.128a, o).

Dismantle sufficient valves and special fittings (thermometer wells, tees, check valves, pressure sensors, etc.) to check condition and sanitation.

Policy toward valves and fittings made of "optional metal alloys" is the same as outlined above for pumps made of such materials.

Replacement valves and fittings shall comply with the applicable 3-A Sanitary Standards.

The trend to automate the cleaning of equipment and reduce the mount of hand cleaning has been occurring in the dairy industry for many years. Plant management has learned the advantages of CIP cleaning and elects automation to an increasingly greater degree. When CIP systems are installed, the amount of hand cleaning necessary to clean valves, pumps, and appurtenances is generally kept to a minimum. During our routine plant inspections, we have noted many plants that have incorporated valves that require daily disassembly and hand cleaning. All hand operated valves and all ball valves (both hand operated and automatically actuated) must be dismantled and hand cleaned. When these valves are found dirty during our routine plant inspection, make the recommendation to dismantle daily and hand clean the appropriate valve and, if appropriate, recommend to the National Field Office a reduction in plant status.

Plug valves shall comply with the *3-A Sanitary Standards for Plug Type Valves for Milk and Milk Products, Number 51-* . When cores for plug type valves are made of plastic or rubber-covered metal, check for deterioration, sloughing, bubbles, etc. in the coating and recommend replacement or recoating when applicable.

Compression valves shall comply with the *3-A Sanitary Standards for Compression-Type Valves, Number 53-* . Check that the stems of manually operated compression type valves are fastened with proper, easily removable "R" clips (no cotter pins, wire, bent nails, etc.). Valves with powered actuators shall have at least 1-inch clear space for inspection, between the actuator and the valve. Powered actuators shall be readily removable from the stem. In addition, product contact surfaces shall be self-draining when properly installed.

Ball valves shall comply with the *3-A Sanitary Standards for Ball Valves for Milk and Milk Products, Number 68-* , (note that the 3-A Accepted Practice for Spray Dryers has an

exemption to this requirement in high pressure applications). All ball valves, whether manually or automatically actuated, require daily dismantling and hand cleaning.

Butterfly valves, commonly used on farm bulk tanks, are not satisfactory for plant use except in some dry product applications. Proper cleaning of these valves when used in fluid applications requires daily dismantling and hand brushing. If you encounter butterfly valves during a survey ask to have them dismantled. If they are found unclean recommend replacement with a valve that complies with the 3-A Sanitary Standards.

Disk valves are similar to butterfly valves, except the stem that rotates the disk does not penetrate the seal face. These valves are acceptable. Manually operated disk valves must be disassembled for hand cleaning. Valves with powered actuators shall have at least 1-inch clear space for inspection, between the actuator and the valve. In addition, powered actuators shall be readily removable from the stem.

In May 1997 the 3-A Sanitary Standard for shutter-type valves was rescinded and no further action is expected on this standard. Therefore, the Koltek Shutter style valve does not comply with the 3-A Sanitary Standards. Any valves installed in plants prior to May 1997 are grandfathered. If this type of valve is noted in the plant, request that it be dismantled and inspect the interior areas. If unsanitary conditions are observed recommend daily dismantling and hand cleaning or replacement with a valve that complies with the 3-A Sanitary Standards.

Special air operated valves designed for CIP cleaning should be dismantled and checked in sufficient numbers to determine adequacy of cleaning. For proper cleaning, such valves should be actuated to move up and down during the recirculation cleaning regimen for cleaning of the stem and O-ring(s).

E. Prefilters (58.128o).

Product filters that utilize a single service filtering media (i.e., cloth socks) shall comply with the *3-A Sanitary Standards for Milk and Milk Product Filters Using Disposable Filter Media, Number 10-* . The filtering media shall be removed prior to CIP and shall be disposed of after each use. It is unsatisfactory to wash and reuse the filters, if this is observed recommend daily disposal. This shall be considered a category D deficiency unless the recommendation is on a previous survey. Then it shall be considered a category C deficiency.

Product strainers shall comply with the *3-A Sanitary Standards for In-Line Strainers for Milk and Milk Products, Number 42-* . Dismantle and check the strainer for sanitation and condition. If pitted product contact surfaces, improper radii in O-ring grooves, etc. are present, this item is unsatisfactory. In addition, if debris is noted, recommend removing the strainer prior to CIP for hand cleaning. If wedge wire is used, recommend removal for cleaning in a COP tank. The tank should be designed to prevent damage to the wedge wire strainer during cleaning.

Note:

Woven wire screens do not comply with these standards.

F. Equipment Sanitation (58.146a).

All product contact surfaces shall be subjected to an effective sanitizing treatment prior to use. The only exception is raw product storage tanks. Sanitizing is a "should" item of §58.146a

Equipment which has been used and then sits idle for 2 hours or more should be rewashed and sanitized prior to being reused.

G. Compliance with the 3-A Sanitary Standards (58.128o).

This policy shall apply to all equipment in the plant except for previously identified grandfathered equipment. Report the deficiency under the appropriate item number (i.e., a new mixer/molder should be reported under Item C28–Mixing & Molding Equipment). Do not try to specify how to correct deficiencies related to the equipment design or engineering. Plant management or the equipment manufacturer should initiate any modifications.

Equipment accepted or approved by the USDA FSIS, USDA AMS Meat and Poultry Review Section, or a State Inspection Agency does not confer acceptance by the Dairy Grading Branch.

1. Inspection of equipment not covered by a 3-A Sanitary Standard.

For equipment that is on the *Accepted Equipment List* follow the guidelines for section 3 below.

For equipment not listed, use the *USDA Equipment Guidelines* as the reference. If fabrication deficiencies are noted make a recommendation such as "Provide documentation that {name of equipment} meets the USDA, Dairy Division guidelines" and assign the deficiency to category D (sanitation deficiencies should be assigned to the appropriate category according to Section II, E. Classification of Deficiencies Noted During the Survey). Also, fill out a Nonconforming Equipment Report, with a list of the noted deficiencies (both sanitation and fabrication) if any, and attach it to the survey report. All deficiencies shall also be listed on the survey report with an appropriate category assigned to them.

2. Inspection of equipment covered by a 3-A Sanitary Standard but the 3-A Symbol is not displayed.

Use the appropriate 3-A Sanitary Standard as the reference when inspecting the equipment, whether the 3-A symbol is displayed on that particular piece of equipment or not. However, do not criticize equipment for not displaying the 3-A symbol. The inspection should not include recommending that the equipment manufacturer apply for and obtain the 3-A symbol, since use of the 3-A symbol is optional. Equipment fabricators are not required to obtain 3-A certification

from 3-A Sanitary Standards, Inc. (3-A SSI) for equipment installed for use in USDA approved dairy plants. Nonetheless, all equipment covered by a 3-A Sanitary Standard and installed in an approved facility is required to comply with the 3-A Sanitary Standard regardless of whether the 3-A symbol is displayed.

Equipment that does not display the 3-A symbol should be inspected for sanitation problems and for workmanship, material, and design deficiencies that may deviate from the 3-A Sanitary Standards. Make a recommendation such as "Provide documentation that {name of equipment} complies with the 3-A Sanitary Standards" and assign the deficiency to category D (sanitation deficiencies should be assigned to the appropriate category according to Section II, E. Classification of Deficiencies Noted During the Survey). In addition, fill out a Nonconforming Equipment Report Including a list of the noted deficiencies (both sanitation and fabrication) if any, and attach it to the survey report. All deficiencies shall also be listed on the survey report with an appropriate category assigned to them.

3. Inspection of equipment displaying the 3-A symbol or on the *Accepted Equipment List*.

Pieces of equipment that do display the 3-A symbol or are on the *Accepted Equipment List* should be assumed as acceptable for use in USDA approved plants. A certificate from 3-A SSI is not equivalent to having the symbol displayed (see the guidelines for section 2, above). The inspection of equipment bearing the 3-A Symbol should focus on sanitation deficiencies.

However, if the routine inspection reveals deficiencies with materials, design, fabrication, or workmanship, that appear to violate the applicable 3-A Sanitary Standards or the *USDA Equipment Guidelines* make a recommendation such as "Provide documentation that {name of equipment} meets the 3-A Sanitary Standards or USDA, Dairy Grading Branch equipment guidelines" and assign the deficiency to category D. Also, fill out a Nonconforming Equipment Report with a list of the "3-A" violations noted and attach it to the survey report. Clearly show on the form that the equipment displays the 3-A Symbol or is on the USDA list. All deficiencies shall also be listed on the report with an appropriate category assigned to them.

4. Grandfathered Equipment.

Some equipment in the plant may have a grandfather exemption (see Section I, O. Grandfather Exemption for Plant Equipment). If you have any questions concerning what equipment is grandfathered, check with the National Field Office. Any new or replacement equipment (including most equipment that has a grandfather exemption and is relocated to another facility) shall meet the applicable 3-A Sanitary Standard or the requirements in the USDA Equipment Guidelines.

Item A4—Can Washer (58.128c, 58.146b).

Check the can washer for acceptable construction and delivery of clean, dry cans and covers. When an excessive scale buildup is noted, recommend that the washer be treated to remove scale. Inspect the jet openings used to clean cans and covers, these are unsatisfactory if the

holes are plugged. Check other items, such as the condition of screens in wash and rinse tanks, draining and cleaning of these tanks at the end of the run, proper operation of temperature controls, effective operation and pressure of jets, and the regular changing of the filter on the air dryer. Also check for tight-fitting jacket and doors and an adequate exhaust fan to remove vapors from the washer (failure to exhaust the humid air from the washer could contribute to condensation and mold problems in the receiving room). The results of the can inspection will be a helpful indicator of the washer performance.

The steam pressure to the can washer should be not less than 80 pounds and the temperature of wash solution and final hot water rinse should be automatically controlled. The wash solution temperature should be as recommended by the manufacturers of the washer and the cleaning compound, usually 130-140° F. The final hot water rinse should be 190° F or higher to promote rapid drying of the cans.

Some plants have can washers with stainless steel extensions and drip pans at the can carriage, and the can drippings are collected and added to the plant milk supply. This is not a satisfactory practice because much of this milk has been found to be of reject quality (such milk is exposed in the catch trays to room air contaminants, and drippage from the exterior of wet cans). There is also considerable warming of the milk during the collection process. When the plant is using can drippings in products, assign the deficiency to category B and recommend that the plant discontinue this practice. The drippings shall be used for animal feed or disposed of in a satisfactory manner.

When disposed of as animal feed, cans for handling the drippings should be kept clean to prevent odor or insect problems. Make recommendation for correction when dirty cans are noted. Do not criticize use of rusty cans for this purpose provided they are distinctively marked as animal feed and are used only for handling drippings.

Item A5—Condition of Producer Cans (58.131a, 58.146b).

When milk is received in cans, inspect approximately 50% of the cans available to represent the supply of producer cans received at the plant. Usually this can be most easily accomplished by inspecting cans directly from the can washer. Be sure you have sufficient lighting in the inspection area to check the cans properly; either direct sunlight, strong flashlight, drop cord, or high intensity plant lighting. Consider the can and its cover as a unit and inspect both components. The condition of the cover must be considered in determining the classification of the unit.

When a unit has more than one defect, classify it according to the most serious defect. Use the following terminology:

Good	Clean, well tinned (satisfactory).
Slight Rust	Few rust spots. Still satisfactory for use, but will require retinning soon (satisfactory).
Definitely Rusty	Excessive rust. Should be retinned or replaced (unsatisfactory).
Open Seam	Parted seams or cracks. Usually noted at bottom or shoulder of soldered multiple-piece cans (unsatisfactory).
Dirty	Interior not clean, includes milkstone which is a form of dirty can condition (unsatisfactory).

When inspection of milk cans reveals less than 10% in unsatisfactory condition (definite rusty, open seam and dirty), check this item as satisfactory and show the number of cans inspected and the percent unsatisfactory.

Example:

A5. — 92 (6% unsatisfactory)

If more than 10% of the cans are unsatisfactory, assign this deficiency to a category based on the following chart. Also, record the number of cans inspected, the reason (definite rusty, open seam and dirty), and the percent unsatisfactory.

CATEGORY D	11 - 15%
CATEGORY C	16 - 30%
CATEGORY B*	31 - 39%
CATEGORY A	40% or over

* Although in other cases one category B deficiency would make raw receiving and therefore, the plant ineligible, in the case of unsatisfactory cans list the deficiency as category B on the survey report and assign status of not higher than APPROVED 3-MONTHS to the M1 code.

Example:

A5. — Reduce off-condition cans below 10%. 130 examined (35% unsatisfactory: 20% definite rusty, 9% open seam, and 6% dirty) (B).

When most of the plant's milk is received in bulk (greater than 50% by volume) special consideration should be given when assigning the deficiency to a category. In such instances, the category assignments based on the above percentages of unsatisfactory cans need not apply but the report should stress the need for improvement of the cans.

Example (assuming 20% can milk):

A5. — Reduce off-condition cans below 10%. 130 examined (35% unsatisfactory: 20% definite rusty, 9% open seam, and 6% dirty) (C).

When the plant receives both bulk and can milk, show on the report the approximate percentage of the total milk supply being received in cans. Show the information in the main heading section in the left margin.

Example:

RECEIVING
CANS
20%

When can replacements are needed, recommend that seamless cans with umbrella type lids be provided (this can be handled verbally with management).

Item A6—Milk Route Trucks (58.131c).

Inspect a few route trucks for enclosed bodies, good repair, and for cleanliness. Check for decking boards or racks if more than one tier of cans is carried.

Cans or bulk truck tanks used for the transportation of raw milk from the farm to the plant shall not be used for transporting skim milk, buttermilk, or whey to producers. This does not preclude enclosed tanks with outside-located inlets and outlets to be installed in can route trucks for returning these products to producers, when such practice is permitted by applicable State Regulations.

When unsatisfactory truck conditions are noted, recommend correction.

Sometimes local producers deliver milk or cream direct to the plant in open conveyances instead of using route trucks. When this is noted, recommend use of enclosed vehicles.

Item A7—Housekeeping (58.126e, 58.127f, 58.146d).

Check for good housekeeping, which essentially consists of storing needed items in an orderly manner in their proper place and in excluding unnecessary items.

Although good housekeeping is not directly related to product quality, it is nevertheless an indication of an operation that is under good management control. Minor housekeeping deficiencies may be covered verbally with management, however, if housekeeping is generally poor show a recommendation for improvement on the report.

Containers used for the collection and holding of wastes shall be constructed of metal, plastic, or other equally impervious material and kept covered with tight fitting lids. Waste shall be stored in an area or room in a manner to exclude flies and vermin. Accumulation of dry waste paper and cardboard shall be kept to a minimum and disposed of in a manner that is environmentally acceptable.

Throwaway plastic or multi wall bags may be used as waste receptacles in the plant, provided they are used with a bag holder device equipped with a satisfactory cover.

Receiving—Bulk

Milk Transfer Stations

To provide inspection guidance and clarification of Dairy Grading Branch responsibilities for the inspection of milk transfer or pump over stations, the following is a breakdown of the various types of milk transfer or pump over facilities you may encounter.

A. Stations Receiving 100% Grade A Milk.

Receiving stations that are routinely inspected by the State and are listed in the current copy of the IMS List do not require Dairy Grading Branch inspection or review of patron records. They would not be listed in the *Approved Plant Book* (USDA will provide service and listing in the book at the request of the receiving station).

B. Stations Receiving Both Grade A and Grade B Milk.

These transfer stations generally have two intakes or designated equipment, one for each grade of milk. The intake equipment shall be inspected and the patron records reviewed by Dairy Grading Branch. The facility would be listed in the *Approved Plant Book*.

C. Truck to Truck With No Other Equipment Involved.

This type of activity may occur within a building or on the side of the road somewhere in the countryside. Monitoring and regulating this type of activity is the responsibility of the State Regulatory Authority. Dairy Grading Branch does not have any involvement in these situations. Those situations conducted within a building shall not be inspected nor listed in our *Approved Plant Book*.

D. Truck to Truck Within a Building Using Additional Equipment.

The additional equipment used is the important factor in these situations. This equipment may include pumps, pipelines, valves, cleaning systems, etc. These facilities shall require Dairy Grading Branch inspection and review of patron records. The facilities with eligible status assignments would be listed in the *Approved Plant Book*.

E. Truck to Storage Tank to Truck.

This is a traditional milk receiving station. These facilities shall require Dairy Grading Branch inspection and review of patron records. The facilities with eligible status assignments would be listed in the *Approved Plant Book*.

If you are surveying a receiving station, or transfer station, the applicable inspection requirements are outlined in §58.131b. Read these sections carefully, as well as the following guidelines:

1. A receiving station is defined in §58.101y as “any place, premise, or establishment where milk or dairy products are received, collected or handled for transfer to a processing or manufacturing plant.” Refer to §58.125 through §58.130 for applicable requirements for premises, buildings, facilities, equipment, utensils, and personnel cleanliness and health. Requirements are the same as for processing plants.

2. A transfer station is defined in §58.101z as “any place, premise or establishment where milk or dairy products are transferred directly from one transport tank to another."

3. Premises, as outlined in §58.125.

4. Building, as outlined in §58.126. Enclosed facilities are required except where mild climatic conditions prevail.

5. Floors, as outlined in §58.126c. A concrete slab with a drain and a water hose would constitute minimum compliance for an out-of-doors transfer operation.

6. Lighting, as outlined in §58.126d. Natural outdoor lighting satisfies the requirement if all the milk transfer operations are conducted during the daytime. For night time operations, artificial lighting of 30 F/C is required in the working area. When the transfer operation is conducted indoors, check for 30 F/C artificial lighting.

7. Water supply, as outlined in §58.127a. A supply of potable water is required to hose down milk spillage in tanker pump compartments and to keep floor or slab clean.

8. Hand washing facilities, as outlined in §58.127c, except that hot water is not required at transfer stations that are conducted out-of-doors. At such stations, minimum hand washing facilities would consist of soap and paper towels with the aforementioned potable water supply.

9. Disposal of wastes, as outlined in §58.127f. Drainage from the floor or slab drain shall be properly disposed of either into a sanitary sewer or “where a public sewer is not available, all wastes shall be disposed of so as not to contaminate milk equipment or to create a nuisance or public health hazard.” This wording would permit surface drainage from the site within the limitations specified.

10. General construction, repair and installation of equipment, piping, and utensils, as outlined in §58.128a. Review this section for applicable requirements. (When tanker hoses are used to transfer the milk, there are no applicable requirements for equipment, piping, and utensils.)

11. Personnel, cleanliness and health, as outlined in §58.129 and §58.130. Review these sections for requirements, which are the same as for personnel who work in a processing plant.

The above are minimum requirements for all regularly used transfer stations. Exceptions to these requirements may be made for transfer of milk from one tanker to another for reasons of truck breakdowns, temporary weight restrictions on roads, short-term use while a satisfactory facility is being constructed, etc.

Item A10—Room Construction (58.126, 58.131b, c, 58.146c, d).

See the guidelines for Item A1–Room Construction.

Enclosed facilities are required except where mild climatic conditions prevail, in which case covered facilities are satisfactory. Mild climatic conditions shall be defined as the absence of snow or freezing temperatures during the winter months. APPROVED 6-MONTHS is the highest status that can be assigned when a plant that receives farm bulk milk does not have satisfactory enclosed or covered facilities available for cleaning the truck tanks, piping, and accessories. Contact the National Field Director if in doubt which requirement applies for a particular location.

In instances where the plant merely loads or unloads milk or milk products (no washing of the tank), a concrete slab with a drain and a water hose are the minimum facilities required, provided that the products can be transferred under sanitary conditions. (For example, when a top vent filter is in place during unloading or when closed system piping is employed for load-out.) If the tank is washed at another location, show on report the name and address of the plant or location where the tank is washed and sanitized

Bulk milk receiving rooms shall be separated from the processing rooms by a solid wall. Inspect for complete segregation of bulk milk truck unloading operations from any adjacent processing room. If the required segregating wall has a doorway for personnel, such doorways shall have a self-closing solid door.

Note:

> The solid door should ordinarily be kept closed, although there is no objection to keeping it open for plant ventilation through a screen door during periods when bulk milk receiving operations are not underway.

Inspect the ceiling, walls and floors for construction, condition, and cleanliness. Check the floor drain(s) for proper trapping. Sand pit collection sumps are often provided prior to the drain traps. This is satisfactory practice because the drains and traps would otherwise be quickly plugged up from the dirt and sand brought in on the truck wheels. Preferably, the sump and its outlet to the drain should provide for self-skimming of the water surface in the sump to remove butterfat, foam, or other floating debris. Remodeling of existing drains for self-

skimming is not required but guidance to this effect should be provided for new installations or major remodeling.

Lighting in the bulk receiving facility should be at least 30 F/C intensity at the room areas where unloading pumps and hookups are made and where the tankers and equipment are washed. Lighting in the rest of the room must be at least 5 F/C. When the tanker interior is cleaned by hand-wash methods, a supplementary light source may be needed to provide adequate illumination inside the tank. A voltage reduced, protected bulb with retractable cord is a good, safe way for management to provide lighting for this job.

Item A11—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2–Lighting & Ventilation.

Item A12—Pumps, Pipelines, & Valves (58.128, 58.131d, 58.146a).

See the guidelines for Item A3–Pump, Pipelines, & Valves.

Use this item to report condition of the plant pumps, pipelines, and fittings employed for unloading tankers.

The unloading lines shall be capped when not in use.

Use of tygon or similar plastic hose material that complies with the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* is satisfactory. Where hose collapse is a problem, special tygon hose is available which is specially protected against collapse by integral spiral windings of more rigid PVC material.

Using rubber tubing when the material complies with the *3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-* is also satisfactory. Wire reinforced rubber hose is acceptable if the rubber material complies with the above 3-A requirements and is in good sanitary condition without any apparent breaks or crimps on the side walls of the hose. Check the interior carefully with the flashlight.

Checking for compliance of hose material with the 3-A requirements is not necessary. However, in instances where the material is questionable, ask management to supply a letter or other evidence from the hose manufacturer verifying 3-A compliance.

Be sure to dismantle any sampling, air eliminator, or milk metering devices and check for proper daily cleaning. Make applicable recommendations about sanitation and condition deficiencies.

Item A13—Truck Tanks, Pumps, & Fittings (58.131c, 58.146c).

Condition of pump, pipes, hoses and fittings in the back compartment of farm bulk trucks should be reported under this item following the inspection guidance outlined in guidelines for Item A3–Pumps, Pipelines, & Valves.

Farm bulk trucks shall comply with the *3-A Sanitary Standards for Stainless Steel Automotive Milk and Milk Products Transportation Tanks for Bulk Delivery and/or Farm Pick-Up Service, Number 5-* . Try to inspect at least one cleaned bulk truck tank during a survey of small plants and two or three at large plants.

The pump and hose cabinet and manhole dust cover shall be tight fitting and gasketed to prevent entrance of road dust. Outlet valves shall also be suitably protected by location in a gasketed compartment or by provision of a tight fitting dust cover.

When either the plant or farm bulk truck unloading hose is cleaned by recirculation procedures, there is no maximum hose length. However, when either manual or power brush washing is employed, hose lengths should be restricted to that which may be accommodated by the brush length (hose reversal permitted).

Occasionally milk may be held overnight in the farm bulk truck before unloading into plant. This is satisfactory procedure if the truck mounted pump, fittings and hose are cleaned before overnight storage. In the morning, the clean pump and hoses may be used to unload the milk. After washing of the tank, the truck is ready for farm pickup of milk without rewashing the just-used back compartment equipment. This corresponds to usual practice when a number of loads are picked up from the farm on the same day. Washing between loads is not necessary when empty time is short.

Inspect the interior of the tank with a flashlight and if necessary, enter tank for close examination. All semi-type tankers should be entered for inspection because it is not possible to inspect all surfaces from the manhole (before entering any confined space follow the guidelines in Section I. Item P). The inspection should include careful checks for cleanliness and for cracks, especially around piping connections, the outlet, and any previously repaired areas. Also, check the exterior jacket of the tanker. It should be clean and free from open seams or cracks that would permit liquid to enter the insulated jacket.

The tanker vent should be provided with an adequate filtering device during loading and unloading. Although this is a “should” item, criticize lack of air filtration at the vent.

§58.146c outlines a tagging system for cleaned and sanitized tankers that may be helpful at certain plants to monitor the performance of plant employees and equipment with respect to tank cleaning (a “should” item).

Item A14—Cleaning Facilities (58.131c, 58.146).

This item covers the facilities provided in the bulk milk receiving or washing room for cleaning bulk truck tanks and their accessories.

When tanks are washed by CIP methods, the system should have a recording thermometer in the return line and automatic temperature controls. The recording chart should show the date, tanker identification, and be initialed by the employee operating the system. Good slope for solution drainage from the tanker is important for successful mechanical cleaning. Such slope is usually provided by the designed pitch of the floor in the tanker washing area. Separate solution and rinse tanks are desirable for making up cleaner and rinse solutions, adjusting solution temperature, and keeping a low solution level in the tanker during recirculation. However, if tankers are being satisfactorily cleaned without such tanks, check the item satisfactory. If cleaning performance is inadequate, look at the CIP charts, spray balls, pumps, valves, and monitoring system for deficiencies and recommend needed corrections.

When the truck tanks are washed manually, check that the buckets and cleaning tools that are used will not scratch the tank and that a safe light source is available to aid in the cleaning.

Satisfactory facilities, usually a double compartment sink, should be provided for cleaning the tanker outlet valve, pump, fittings and hoses. The parts may be cleaned in a wash tank in or near the bulk room. Hand brushing in a bucket of cleaning solution at the truck pump compartment is also a satisfactory practice. As another alternate method, these parts may be cleaned by recirculation turbulence principles in a COP tank equipped for this purpose. Washing or rinsing of parts on the floor is unsatisfactory.

§58.146a of the General Specifications states that steel wool or metal sponges shall not be used in the cleaning of any dairy equipment or utensils. If this practice is noted during the survey, make an appropriate recommendation.

Suitable detergents, dairy cleaners, sanitizers, and wetting agents or other similar materials may be used to facilitate cleaning. To avoid unnecessary duplication of effort, Dairy Grading Branch plant surveys will not cover checking for plant compliance with FDA and EPA requirements.

Item A15—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7–Housekeeping.

Quality Program

Item A18—Sight - Smell Grading (58.133a, 58.136).

Observe the receiving of milk to determine if each can is examined routinely for appearance and odor. Smelling the underside of the can covers shall not be considered as adequate milk grading procedure. Check several cans of milk to verify that adequate grading is performed and that reject quality milk is actually rejected. When grading is deficient, recommend that line grading be improved to assure that only acceptable quality milk is received in the plant.

Determine if it is regular practice to make sight-smell checks of each tanker-load of bulk milk before unloading. This provides a check on the grading of the milk at the farm before pumping into the bulk truck and allows segregation in case of serious quality defects. Preferably, the sight-smell grading should be performed by a plant employee, but there should be no objection if the manager delegates the responsibility to bulk route drivers. It is also important that sight-smell tests (as a minimum) be performed before unloading each tanker of milk received from other plants, receiving stations, or transfer stations. If it is not routine plant practice to make sight-smell checks before unloading bulk milk, discuss this with the plant manager and recommend on the report that such checks be made.

Item A19—Raw Products Testing (58.132, through 58.141).

The Grade A quality program is considered an alternate acceptable program as provided in §58.141 of the General Specifications. Therefore, when the plant has no producers of its own (i.e., the entire milk supply is purchased) and is under jurisdiction of a Grade A authority and meets their requirements, or when the plant supplements it own milk supply with purchased tanker loads of milk under the jurisdiction of a Grade A authority, the supplemental milk is considered acceptable as provided in §58.141 of the General Specifications. When this occurs, reviewing quality test results is not necessary. Milk from the plant's own producers, regardless of the grade, must comply with the USDA milk quality program as outlined in this section.

When received at the plant, fluid dairy products shall be 45° F or lower, milk in cans shall be 45° F or lower unless processed or cooled to that temperature within two hours of receipt, and acid whey with a pH of 4.6 or below may be received at any temperature.

Where developed acidity in milk is a problem, laboratory equipment for running acidity tests should be provided at the intake in a handy location for use by the milk grader on borderline quality milk. The company should establish a definite acidity reject level.

A. Abnormal Milk Program (Mastitis Control) (58.133b).

The General Specifications require each patrons milk to be tested at least four times in each six month period at irregular intervals. When two of the last four consecutive somatic cell counts exceed 750,000 cells per milliliter (ml) the appropriate State regulatory authority shall be notified and a written notice given to the producer.

In addition, another milk sample shall be tested within a period of 3 to 21 days. If the result is more than 750,000 cells/ml, the patron's milk shall be rejected until corrections are made and the somatic cell count is reduced to 750,000 cells/ml or less.

During the plant survey, determine if these functions are being routinely performed. When the review finds that tests are not performed at least four times in each six month period, assign the deficiency to category D. When the review finds that there are producers with somatic cell counts above 750,000 cells/ml without the proper follow-up, assign the deficiency to category C.

When the plant has no abnormal milk program or has a program that has major deficiencies, this deficiency should be assigned to category C.

If the next survey reveals the plant still has no abnormal milk program or there remain major deficiencies in the program this deficiency shall be assigned to category B.

B. Drug Residue Testing (58.133c).

All milk received shall be tested, prior to processing, for beta lactam drug residues. A sample shall be taken from each tanker load prior to further commingling. For can milk, a composite sample shall be formed at the plant, using a sampling procedure that includes milk from every can on the vehicle. In addition, individual producer samples shall be obtained from each milk shipment. These samples do not have to be tested unless the load sample is positive for antibiotics. (See 7CFR 58.133c for more information.)

The plant shall notify the State Regulatory Agency of any positive sample and all milk from the producer responsible shall be rejected until milk from a subsequent milking does not test positive. When the review finds the tests are not performed on each tanker, or lack of proper follow-up, assign the deficiency to category A.

C. Sediment Testing Requirements (58.134).

Sediment tests are important if a plant is to have a meaningful quality control program. The General Specifications require that the tests be performed on samples of all milk received from individual producers (both Grade A and Grade B producers) at least once per month at irregular intervals. In addition, follow-up testing is required on No. 3 and 4 results. Determine if the plant is performing these necessary tests. Also determine if required retests are made. Follow-up testing of a producer’s milk may be discontinued when a No. 1 or 2 result is obtained. Test procedures shall be those outlined in the latest edition of *Standard Methods for the Examination of Dairy Products*.

1. Can Milk.

One or more cans of milk selected at random from each producer using the off-the-bottom method. This method uses a one pint sample filtered through a 1⅛ inch diameter disc.

2. Bulk Milk.

The General Specifications refers to the mixed sample method for bulk milk using a one pint mixed milk sample through a 0.4 inch diameter disc. The latest edition of Standard Methods references an additional method using so-called "universal samples" of either 1, 2, or 4 ounce sample sizes and employing discs with respective diameters of 0.1, 0.14, or 0.2 inches. This test method is already in use and should not be criticized.

If the plant has no photographic standard on hand to aid in classifying discs, recommend that a standard be obtained. The following sediment and other standards are available:

Standard Number	Cost	Description
7 CFR 58.2729	$5.00	Three photographs for classifying 1⅛ inch discs by off-the-bottom method (can milk).
7 CFR 58.2731	$5.00	Three photographs for classifying .4 inch discs for mixed sample method (bulk milk).
7 CFR 58.2732	$5.00	Photographs to show 0, .5, 1.5, and 2.5 mg. sediment discs for use with 1, 2, or 4 ounce samples on .1, .14, or .20 inch diameter discs (universal samples, bulk milk).
7 CFR 58.2676	$5.00	Photographs for classifying scorched particles
NA	$20.00	Butter Color Chips

Send a check or money order (payable to Agricultural Marketing Service) to:

USDA/AMS/Dairy Programs
Dairy Standardization Branch
Room 2746-South Building
1400 Independence Ave., SW
Washington, D.C. 20250-0230

Phone (202) 720-7473
Fax (202) 720-2643

When a plant is not making the monthly tests or retests as required, make a recommendation that illustrates the deficiency.

Example:

A19. — Perform sediment tests at irregular intervals, now always made on the first Monday of each month with the retests done on the second Monday (D).

It is not necessary to show sediment test summaries on the survey report. Checking plant follow-up procedures will suffice. Similarly, no report comment is needed when the required tests are performed at another company or private laboratory. Test records should be available for review at the plant that receives the milk.

D. Bacteria Testing Requirements (58.135).

The General Specifications require that the tests be performed at least once per month at irregular intervals. Review §58.135 of the General Specifications for details on test requirements. When the bacterial estimate exceeds 500,000 cells/ml the producer shall be notified with a warning of the excessive bacterial estimate.

When two of the last four consecutive bacterial estimate exceeds 500,000 cells/ml the appropriate State regulatory authority shall be notified and a written notice given to the producer. In addition, another milk sample shall be tested within a period of 3 to 21 days. If the result is more than 500,000 cells/ml, the patron's milk shall be rejected until corrections are made and the bacterial estimate is reduced to 500,000 cells/ml or less.

During the plant survey, determine if these functions are being routinely performed. When the review finds that tests are not performed at least monthly assign the deficiency to category D. When the review finds that there are producers with bacterial estimates above 500,000 cells/ml without the proper follow-up, assign the deficiency to category C.

Examples:

A19. — Run producer bacteria tests at least monthly, no tests for June (D).

A19. — Run retests on producers milk when bacterial estimates exceed 500,000 cells/ml (C).

It is not necessary to show plant bacteria test summaries on the survey report. Checking plant follow-up procedures will suffice. Similarly, no report comment is needed when the required tests are performed at another company or private laboratory. Test records should be available for review at the plant that receives the milk.

E. Quality Records, Farm Follow-up (58.137, 58.138, 58.139, 58.140).

Check that accurate records, listing the results of quality tests of each producer, are kept on file at the plant where the milk is received. Make a cursory review of the records and quality test results, including required retests.

A plant representative should visit each producer of substandard quality milk to inspect milk production conditions and offer assistance for quality improvement. Check that field service assistance is provided for inspecting farms and follow-up on substandard quality tests. If there

is failure to make required follow-up visits or poor quality as determined from plant records, recommend increased fieldwork activity to improve milk quality.

Plant management should be encouraged to maintain adequate records regarding farm inspections, follow-up quality calls, etc. to establish that an effective milk quality control program is being applied.

Dairy Grading Branch is concerned with compliance of our regulations that require individual patron records to be available for review. However, we also look for opportunities to eliminate instances where duplication of inspection can be avoided. One area of repeated concern has been the availability of patron records at receiving stations and pump over transfer stations. The following are guidelines for the review and availability of patron records.

1. If the receiving station or pump over transfer station requests to be identified and listed as a cooperative entity which retains control over a patron list and payments for milk received, then full patron quality and field service records shall be available for review. This is required even though the actual testing and field service may be performed by the processing plant receiving the milk. This requirement may be satisfied by one of the three options below:

    a. Maintain a duplicate set of records at the station location.

    b. Obtain the complete records from the processing plant during the time of the survey for presentation to the survey inspector.

    c. The plant survey inspector may travel, at the applicants expense, to the location where the records are maintained. All travel time and expenses will be charged as part of the cost of the survey.

2. If the receiving station or pump over transfer station is owned and operated by a larger cooperative or firm, The Dairy Grading Branch will accept a letter of certification from the main plant or laboratory where the patrons' quality tests are performed and the records maintained. The letter is to certify that all of the milk quality tests, records and farm follow-up procedures required by the *USDA General Specifications for Approved Dairy Plants and Standards for Grades of Dairy Products*, §58.132 through §58.141 are being properly conducted. This letter of certification is to be renewed each year and will be verified by at least one site visit to the laboratory by a USDA inspector, The cost of this verification visit is to be borne by the processing plant responsible for the records or billed directly to the corporate office.

General Specifications §58.138 requires that the first shipment of milk from a new producer or an intermittent milk shipper be tested for bacteria and sediment as well as the usual daily drug residue, odor and appearance checks. If the drug residue, appearance, odor, and sediment results are satisfactory, the milk may be received and subsequent milk shipments shall be tested according to the procedure established for regular shippers.

§58.137 requires exclusion of milk from shippers under the following circumstances:

1. If a new producer's milk is unsatisfactory for appearance, odor, or sediment.

2. If the milk sediment has been #3 or 4 upon daily testing for more than ten calendar days.

3. If three of the last five milk bacterial estimates exceed 500,000 cells/ml.

4. If three of the last five somatic cell counts exceed 750,000 cells/ml.

5. If the milk has been classified as having a positive test for antibiotics. After a positive result, check that future shipments are not accepted unless tested and found satisfactory.

F. ADV Testing (58.336c).

Regular ADV testing may be helpful in locating and correcting excessive lipase activity in the raw materials which otherwise could cause rancid flavor and odor problems in the finished product, particularly cheese and butter. An ADV testing program is not required for plant approval but it is USDA policy to recommend ADV monitoring of raw materials when the butter exhibits progressive type lipase or rancid conditions.

When official grading, keeping quality tests, or free fatty acid tests indicate progressive type rancid butter conditions, plant status action shall be taken as outlined in DA Instruction 918-I. This requires a plant survey, which should include a thorough review for possible causes. This would include an assessment of raw product age and quality, cream handling temperatures and procedures, pasteurization equipment and procedures, and protection of cream and butter from subsequent contamination. If the survey reveals no immediately apparent cause in the form of faulty plant procedures, equipment, construction, sanitation, or pasteurization, a recommendation should be made for management to immediately initiate an ADV testing regimen on the various sources of milk or cream. Initially at least, each tanker load received should be tested along with screening as necessary of can-handled milk or cream. Laboratory records should be kept. Plant policies should be established regarding acceptable ADV levels in raw product and for follow-up and corrective procedures when these levels are exceeded.

G. Receiving Tests for Raw Cream (58.336a through f).

If cream is received from other plants, determine if quality checks are made. As a minimum, each tanker load should be subjected to sight, smell, and temperature checks (see Item A19—Raw Products Testing) before unloading. A log should be maintained showing relevant information about each load. The plant should also have a regular sampling and testing program concerning other cream quality tests as may be applicable to the type of cream received (tests for acidity, bacteria, Coliforms, acid degree value, coarse sediment by the sani-guide test, etc.). Find out if the test results are relayed back to the shipper and if appropriate follow-up action is taken when unsatisfactory results are obtained.

Item A20—Milk Pickup Frequency (58.131b, 58.142).

Milk should not be more than three days old when picked up from the producer and delivered to the plant, receiving station, or transfer station. Cream and whey cream should not be more than four days old when shipped for processing, however for quality purposes, it is strongly recommended that cream and whey cream pickup frequency be limited to a maximum of once every three days.

When a less frequent pickup schedule is noted for these raw materials, make an appropriate recommendation. No criticism is appropriate however, when pickup delays are due to adverse weather conditions, such as storms or snow-blocked roads.

Since this is a "should" item, deficiencies concerning pickup frequency are not serious factors in determining plant status (category D). Nevertheless, the frequent pickup of raw materials should be stressed during plant surveys as a quality promoting measure. Freshness of dairy ingredients is usually directly related to final product quality.

Item A21—DMC - Commingled Milk (58.143).

§58.143 of the General Specifications requires that the bacteria estimate of commingled milk in storage tanks shall not exceed 1,000,000/ml. Dairy operations involving the receipt or processing of milk will be subject to the Direct Microscopic Clump (DMC) count test. The record of a plant's commingled milk quality, as determined by official DMC test, is an integral factor in assigning plant status. A DMC average of one million or under for the current survey shall be considered satisfactory. If more than one million, the plant status is directly affected.

The FULL STATUS plant rating is limited to plants that meet the one million requirement on at least two of the last three DMC test averages. Page Z should include a summary of the DMC results from the last three surveys to illustrate the test history.

In the event a plant has received a reduced status assignment due to high DMC results, the manager may want to improve the rating. In this case the manager need not wait until the next cycle inspection, but may request another testing whenever the milk quality has been sufficiently improved. The resampling shall be on an unannounced basis.

A. Frequency of Sampling for DMC Tests.

There are two sampling levels for DMC testing, normal and reduced:

1. Normal sampling level (each survey).

During each survey, except timely follow-up surveys after the assignment of the INELIGIBLE, NO STATUS ASSIGNED, or PROBATIONARY 10-DAYS status, provided that the reduction in status was not based on the DMC test results.

2. Reduced sampling level (1 sample per year).

A reduced level of sampling will apply when the average DMC results are one million or below on the previous three consecutive sets of samples. When a plant qualifies for the reduced level, take only one set of samples at any survey performed during the following calendar year. The subsequent yearly samples shall be taken at varied seasons of the year to represent both summer and winter milk quality (not every other survey). This yearly sampling rate may be continued indefinitely, as long as the average result is one million or below. Whenever sampling yields a DMC average above one million, the normal level of sampling shall be resumed and continued until three successive averages are one million or less.

To determine if a plant is on normal or reduced sampling, the inspector shall review the previous survey transmittal letter that shows the plant DMC history. When DMC samples are not required, the inspector shall show a dash in the satisfactory column for this item and the following comment:

A21. — No samples taken. Plant is on reduced testing.

When no samples are taken for DMC testing during a plant survey, prepare form DA-144 as shown in Exhibit A1. However, do not mail the form to the laboratory: send it with the survey report to the National Field Office. Different comments can be used as appropriate in the remarks section (e.g., no milk available for sampling, milk is received only every other day, etc.).

B. Sampling Procedures.

When a plant receives whole milk, collect only commingled whole milk samples, do not obtain samples of skim milk processed from this whole milk In drying plants that receive only skim milk, obtain samples from skim storage tanks. Be certain that the milk in storage tanks has been thoroughly mixed prior to obtaining the sample.

Obtain three(3) samples of commingled milk. When more than three filled storage tanks are available, randomly select three tanks for sampling on a predetermined basis (Exhibit A2). If milk is stored in only one storage tank, obtain three samples from the same tank at the same time. When a single tank is used on an "in and out" basis, obtain the three samples at different times and identify them accordingly (Exhibit A3).

Some cheese plants (particularly Swiss and cottage cheese) add lactic culture to the milk in the storage tanks. Where this is practiced, arrange with the manager for taking the raw milk samples before the culture is added.

Samples shall only be taken from storage tanks in the plant that contain commingled milk. Sampling from bulk trucks would tend to give unfair advantage to those plants because the milk would be fresher, less pumping and handling, etc. The only exception is at transfer stations

that do not have milk storage tanks. At such transfer stations, bulk truck tanks may be sampled provided that the milk is reasonably well agitated and is not creamed off (Exhibit A4).

Take samples in a sanitary manner. Physical cleanliness of surfaces contacting the milk is important although absolute sterility is not necessary. Sanitize the sampling valve on the storage tanks by using a clean brush and brushing the outlet area of the valve with a 200-ppm chlorine solution or equally suitable sanitizing solution. Using a 6 to 8-quart container, drain out approximately 2 to 5 quarts of milk to obtain a thorough flushing. Following this, collect the sample into a sterile sample container by placing the bag under the outlet and carefully drawing milk from the valve. Alternately, the samples can be taken by a qualified plant employee, follow the plants request in this regard.

When sampling from tank trucks at transfer stations, sampling from the top may be easier than sanitizing the outlet value and sampling at that point. Milk may be withdrawn from the top with a single service sampling straw or a sanitary dipper (supplied by the plant). If a dipper is used, sanitize it with a chlorine solution or other suitable sanitizer, then rinse it twice in the milk before pouring the sample into the sample container.

In instances where a number of holding tanks are available for sampling, collecting the samples from all the tanks before continuing is satisfactory. Do not hold or store samples prior to applying smears to the slide for more than 20 minutes without refrigeration.

C. Preparing the Slide.

Be sure that the sample is properly mixed so as to be homogeneous and then transfer milk to the slide using a glass capillary tube calibrated to deliver 0.01 ml. of raw milk. USDA resident inspectors may optionally use a 0.01 ml. stainless steel syringe or pipet to transfer the milk (use of these is limited to USDA laboratories where facilities are available for special cleaning, care, and calibration).

Check the slide to make sure it is clean and free from dust. The sample of milk should be applied to the same side on which the glass is etched. Do not get finger prints on the areas where the milk film is to be applied. Using a pencil, write the plant number, your initials, the date, and identify the sample areas on the slide with numbers (1 through 3) corresponding to identification on form DA-144. Place the slide on the drying box and plug the box in. The drying box should be level to insure that the film dries uniformly.

To transfer test portions to the slide, dip the tip of the capillary tube just below the surface (excluding foam). Capillary action should draw the milk into the tube (the tube should be full, tapping the rubber bulb will sometimes help). Wipe any foam from the exterior of the tube with a clean dry paper towel being careful not to remove any of the sample from the tube.

Place the tip near the center of area to be covered and carefully expel the 0.01 test portion. The hole in the top of the rubber bulb needs to be covered to expel the sample. With a clean, bent needle (a sanitized paper clip may be used), promptly spread the sample uniformly over

the entire square-centimeter area. Wipe the needle between samples on a clean dry paper towel or dip it in a sanitizer solution. Use a new tube for each sample. The film should be dry within five minutes.

D. Preparation of Form DA-144.

Information on the form should include the name, location, and number of the plant, date sampled, whether whole or skim milk, temperature of milk, and the signature of inspector. In addition, show any information that may further relate to the test results, such as whether it is holdover milk, grade A or B milk, or if milk has been transferred from a receiving station (see Exhibits A1 through A4).

Attach one copy to the survey report. Do not remove the carbons from the rest of the copies. Carefully wrap them around the slide and pack into the mailing tube, additional paper should be added as necessary to prevent breakage in the mail.

Plant inspectors should send the slides to the laboratory on a daily basis using prepaid labels. Prompt mailing is necessary to enable the National Field Office to show the results on the corresponding plant survey report without delay. Resident graders will forward one copy of form DA-144 showing test results to the National Field Office with the survey report and retain one copy.

The mailing tubes, and slides will be reused and will be returned by the laboratory to the National Field Office for distribution to the individual inspectors.

Raw Product Storage

Item A24—Room Construction (58.126, 58.146d).

See the guidelines for Item A1–Room Construction.

For purposes of salmonella and listeria control, personnel traffic through the storage, processing, and packaging areas should be held to a minimum. Milk truck drivers, fieldmen, and farmers should not walk through these areas since contamination on shoes and clothing may be carried from farm animals which are a major source of contamination. The plant should take proper precautions to minimize or control personnel traffic through the plant.

Item A25—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2–Lighting & Ventilation.

Item A26—Pumps, Pipelines, & Valves (58.128, 58.131d, 58.146a).

See the guidelines for Item A3–Pump, Pipelines, & Valves.

Item A27—Product Cooler (58.128a, i, j, k).

Most coolers (heat exchangers) for raw products are one of the following three types. They may be effectively cleaned by proper recirculation procedures (mechanical cleaning). However, unless there is an effective strainer, filter, or clarifier upstream from the unit, proper rinsing of extraneous material from the equipment may be a serious problem, particularly with plate type units which are pressed tightly together.

A. Plate type (58.128j).

Plate type heat exchangers shall comply with *the 3-A Sanitary Standards for Plate Type Heat Exchangers for Milk and Milk Products, Number 11-* .

Plate heater exchangers shall be completely disassembled for inspection of the product side of each plate during the survey. Arrange to be present during the dismantling and opening of the heat exchanger. If the unit is clean, check this item satisfactory. If plates are dirty recommend daily opening for inspection and any needed hand cleaning until an adequate recirculation cleaning procedure has been established. If the plates are clean except for loose extraneous material (gasket particles, hair, insects, filter fragments, etc.), recommend daily dismantling for inspection and rinsing, or providing a filter, strainer or clarifier upstream from the heater exchanger.

Plate gaskets which are flattened should not be criticized if they are still resilient and effectively prevent leakage. However, when gaskets are loose, checked, leaky, deteriorated, sloughing off, etc., regasketing should be recommended.

B. Tubular type (58.128k).

Tubular heat exchangers shall comply with the *3-A Sanitary Standards for Tubular Heat Exchangers for Milk and Milk Products, Number 12-* (formerly a "should" item).

This requirement applies to new installations of heat exchangers for either heating or cooling of product. Do not criticize existing "non-3-A" heat exchangers which are constructed in a sanitary manner, are in good condition, and are found to be clean. Similarly, do not criticize good condition, sanitary "non-3-A" heat exchangers which are simply relocated within the same plant. This would not be considered a new installation.

1. Single tube type.

Inspection may be accomplished by checking only one or two tubes in a unit. If found clean and gaskets are okay, check the item satisfactory. Rinsing of extraneous material from tubular equipment is not usually a problem due to lack of restrictions in the path of product flow.

Recirculation cleaning of tubular type heat exchangers without daily dismantling is a satisfactory practice when an effective cleaning regimen has been established and when suitable rubber or plastic gaskets are used for end caps or heads. If inspection reveals dirty product contact surfaces or paper gaskets, recommend daily take-down for further cleaning and for gasket replacement until suitable corrections are made.

2. Triple or double tube type (Tube within a tube).

These units usually clean very effectively with proper recirculation procedures, but there may be problems with hangup of loose extraneous material at the close-tolerance dimpled areas between tube sections. To inspect a triple tube unit, ask management to dismantle one horizontal assembly of tubes. Elbows at each end must be removed. Be present to inspect tube sections as they are slid apart (they need not be fully removed for inspection). Also, check condition of the gaskets and seals.

If the tubes are not clean recommend improvement of the cleaning regimen and subsequent daily inspection to make sure it is effective. If the tube surfaces are clean, but there is loose extraneous material present, recommend provision of an upstream filter device. Another, but less effective, alternative is reversal of cleaning solution flow during the cleaning regimen. This will tend to dislodge loose material which is hung up on the tube dimples.

Some "Multi-tube" type heat exchangers have fully welded elbows. Dismantling for inspection is not possible. These units are acceptable if they have 3-A symbol authorization under the *3-A Sanitary Standards for Tubular Heat Exchangers for Milk and Milk Products, Number 12-* . As per the fabrication section, accessibility for inspection is not required if the heat exchange surface is one continuous tube and the tubular heat exchanger is designed to be mechanically cleaned. Since inspection of interior milk contact surfaces is not possible, check the inlet and outlet and that the mechanical cleaning procedure is well conceived and controlled. This can

be demonstrated by either a programmed CIP system or by recording thermometer charts showing good manual control of the cleaning regimen.

Tubular heat exchangers with corrugated tubes are acceptable if the unit is drainable.

C. Cabinet surface cooler type (58.128i).

If a surface cooler is used, it shall be the enclosed cabinet type. Inspect sanitation and general condition of plate surfaces, distribution pipe, distribution tray and product collection trough. When recommendations are necessary regarding dirty product contact surfaces, also indicate the seriousness of the sanitation deficiency on the survey report (slight or definite milkstone, slight amount of extraneous material, plugged plates, etc.). If the cooler is the type that requires drip deflector plates, check that they are being used and are installed properly.

Also, inspect the exterior surfaces of coolers for condition and cleanliness.

D. Scraped Surface (58.128o).

Scraped surface heat exchangers shall comply with the *3-A Sanitary Standards for Scraped Surface Heat Exchangers, Number 31-* .

Scraped surface heat exchangers are not normally used as a product cooler for raw milk due to the low viscosity of the product.

Scraped surface heat exchangers shall be disassembled so the sanitary seals and internal parts can be fully inspected. Pay particular attention to the seal design, which is often internal, and sanitation. All seal parts shall be readily accessible for cleaning and inspection. Check the interior of the heat exchange barrel for pitting, scoring or delamination of the plating. Scraper blades shall be free of nicks and burrs, and be easily disassembled. Make recommendations as appropriate. When inspecting scraped surface heat exchangers, caution must be exercised as the scraper blades are extremely sharp and can cause serious injury. Do not handle these components. Have an experienced plant employee conduct the disassembly operation.

Item A28–Storage Tanks - Silo (58.128d, 58.143, 58.232).

New or replacement silo tanks shall comply with the *3-A Sanitary Standards for Silo-Type Storage Tanks for Milk and Milk Products, Number 22-* .

An indicating thermometer for milk temperature is required. The temperature of the milk in the storage tanks shall be maintained at 45° F or lower. Milk in cans shall be 45° F or lower.

The appendix to the 3-A Sanitary Standards for Silo-Type Storage Tanks states that a separate, accurate, seven-day temperature recorder should be provided on all tanks to record temperatures during the filling, storage, emptying, and cleaning periods. Silo tanks, however,

can receive 3-A approval and carry the 3-A symbol without provision of the recording thermometer, since the wording is a “should” item in the appendix. In the past, absence of the recorder was not considered a deficiency. The tendency in the dairy industry, however, is toward larger supplies of milk to be received for processing and more careful monitoring of the milk supply and storage conditions is necessary. If a seven-day recorder is not provided, recommend that one be furnished and assign the deficiency to category D.

The recording charts should be identified by date, silo number, and operator's signature or initials. Review the charts to see that they are being used and properly identified. When charts are not properly notated or if a temperature regulator or recorder is not present make a recommendation for correction.

Silo tanks shall be designed to be cleaned in place (CIP), manual cleaning procedures are not permitted; therefore, a solution temperature sensor and recorder shall be provided. The cleaning solution temperature shall be automatically controlled to maintain proper temperature for best cleaning performance as recommended by the cleaning compound manufacturer and to avoid exceeding the maximum temperature specified by the silo tank manufacturer. Since all surfaces of the tank are not easily available for close visual inspection, the recorder chart provides a record of the applied cleaning regimen. The sensing element of the recording thermometer shall be located in the solution return line.[1]

A separate solution supply tank is desirable for accurate preparation of solution strength, and to prevent pitting or discoloration of tank surfaces where chemicals would otherwise be added. The separate solution tank also permits keeping the solution level very low in the silo to provide maximum cascade cleaning effect on the bottom and lower side wall areas. Solution temperature adjustment is another function easily handled in the solution tank. At many plants, central type CIP pipeline cleaning facilities are utilized to clean silo tanks. These facilities usually have separate solution and rinse tanks, automatic temperature control, and recorder. (Some also have automatic programmers.) Although such facilities are certainly desirable, the separate solution tank is not mandatory if other requirements are met (suitable pump, automatic temperature control, and recorder), and if effective tank cleaning is being accomplished. However, if the inspection reveals deficiencies with tank cleaning, tank damage from chemicals, undissolved cleaning materials, inadequate rinsing, etc., recommend that a separate solution tank be provided.

If air agitation is used, the equipment for producing and introducing the air into the silo shall comply with the *3-A Accepted Practices for Supplying Air Under Pressure in Contact With Milk, Milk Products and Product Contact Surfaces, Number 604-* . This document outlines the

---

[1]Although the sensor for the recording thermometer is located in the solution return line this is not a good place to locate the sensor which controls the cleaning solution temperature. The very large surface area of a silo tank can cool the cleaning solution and a sensor so located would erroneously call for ever-hotter solution which might damage the tank. Temperature control sensors should be located in the solution tank or downstream from an in-line solution heater before introduction to the tank.

requirements for producing the compressed air and for subsequent trapping, filtering, and piping of the air to the point of application. An air intake filter is required ahead of the compressor and a second disposable media filter is necessary in the air pipeline close to the point of introduction. It is not necessary to determine 3-A compliance of such filters however; if missing, recommend that filters be provided. Also, be sure to check daily sanitation on the milk side of air introduction piping back to and including the sanitary check valve. When deficiencies are noted, recommend correction.

Inspect the outlet valve, sampling valve, manhole cover and gasket, as well as the overflow or vent lines which terminate in the alcove area. Use a high intensity spot light to inspect the tank lining for condition and cleanliness. If the dome or liner is dirty or streaked, arrange with management for inspection of the cleaning device located in the dome. Partial plugging of the device is often responsible for poor cleaning performance. This might be remedied by provision of a filter in the cleaning solution tank or line. Means of access to the top of the tank(s) should also be provided to allow easy periodic checks of top cleaning devices and to replace gaskets in associated pipe fittings.

In the case of vacuum buckling or other interior liner damage, there is danger of cracks which would permit leakage into the jacket insulation. Report the extent and seriousness of the buckling, and whether cleaning is adversely affected. Also check the jacket weep holes at the bottom of the tank for product or cleaning solution seepage. If satisfactory cleaning cannot be achieved because of the damage, or seepage is noted, the tank should be taken out of service until repairs are made.

Some shaft and seal assemblies of horizontally mounted mechanical agitators are designed for CIP, some require dismantling and hand cleaning each time the silo is washed. In either case, have the agitator removed for sanitation checks when inspecting the silo.

There is no USDA regulation concerning the maximum age of milk for processing. Storageability of milk depends on many factors, including initial quality, care of handling, and temperature of storage. Therefore, do not criticize extended storage periods for milk (for instance, weekend holdover to accommodate a five or six day work week) when the milk temperature records are satisfactory. Extended milk storage may be discussed with management, but is not unsatisfactory unless there is evidence of quality deterioration in the milk or final manufactured product. Although there are no specific limits for milk storage, it is nevertheless USDA policy to encourage prompt milk processing and also that raw milk storage tanks be washed at least every 72 hours. If the interval is longer than this make appropriate recommendations and assign the deficiency to category D.

When a tank is used for surge tank purposes or when a tank is partially emptied and then later refilled, it should be completely emptied and cleaned daily. Foam and milk residues left on the tank lining may warm up considerably, allowing bacterial development, and then be reintroduced to fresh milk upon tank refilling. Examples of tank use which require daily cleaning are: 1) the whole milk supply tank ahead of a separator or HTST pasteurizer and 2) adding of fresh milk into a tank only partially emptied the day before.

The first 3-A Sanitary Standards for Silo-Type Storage Tanks were assigned serial #2200 and became effective 2/10/65. They required the control area and alcove to be in a "processing area or acceptable tank truck receiving area" and all appurtenances and the terminal end of the vent lines were required to be in the control area. Revision #22-03 became effective 1/5/74 and required that the control area and alcove be in a processing area or an area in the plant at least the equivalent of a processing area. During the 1965-1974 period, quite a few silo-type tanks were installed with alcoves opening into tank truck receiving areas, in conformance with the then effective 3-A Sanitary Standards.

Although such installations are grandfathered, recommend either; 1) that the tanks be provided with filters for vent lines which terminate in the now unsatisfactory area, or 2) relocate the silo so that the control area and alcove are part of a processing area (see Appendix K of the 3-A Sanitary Standard). If management decides to provide filters, caution that their design and maintenance be in accordance with the recommendations of the tank manufacturer. Proper venting under all conditions is extremely important to avoid tank damage or collapse due to vacuum.

Between 1974 and 1992, some tanks were still constructed with control areas and alcoves located outside of a processing area or its equivalent. Handle these tanks in the same manner as for the tanks constructed between 1965-1974.

However, all silo tanks installed new or moved from an existing location after 1992 are required to be provided with a control area and alcove located in a processing area or its equivalent. If this requirement is not met make appropriate recommendations. Alcoves located in an unsatisfactory area are not acceptable for tanks installed or moved after this date (category C deficiency).

Item A29—Storage Tanks - Horizontal (58.128d, 58.143, 58.232).

New or replacement milk storage tanks shall comply with either the *3-A Sanitary Standards for Storage Tanks for Milk and Milk Products, Number 01-* , or the *3-A Sanitary Standards for Uninsulated Tanks for Milk and Milk Products, Number 32-* .

The *3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-* and the *3-A Sanitary Standards for Farm Milk Storage Tanks, Number 30-* concern tanks for farm use. However, cooling and storage tanks conforming with these standards are being used in dairy plants for such uses as holding whey cream at cheese plants and condensed skim milk or cream at evaporated milk plants. Such dairy plant use of farm-type tanks complying with the applicable 3-A Sanitary Standard is satisfactory, provided that the tanks are in satisfactory condition, are adequate for the cooling and storage function required, and are maintained in sanitary condition.

An indicating thermometer for milk temperature is required. The temperature of the milk in the storage tanks shall be maintained at 45° F or lower. Milk in cans shall be 45° F. Also, review the relevant paragraphs of Item A28–Storage Tanks - Silo, for guidance regarding a recording

thermometer, the holding time of milk, the maximum time period between washes of a milk storage tank, the use of a CIP solution makeup tank, the location of the tanks (receiving area verses a processing area), etc.

Storage tanks should be inspected as they become empty and are washed during the course of the survey. Use a spotlight or flashlight to carefully check interior surfaces and particularly the accessory fittings such as gauge pipes, sampling valve, agitator shafts and seals, and outlet valves. Report any deficiencies with sanitation or condition.

Inspect the exterior surfaces of the tank. The jacket should be clean, well painted (unless stainless steel) and free of rusted out areas which might cause off-odors or harbor insects.

When top fittings cannot be easily reached from the floor, the tank should have attached steps or ladder and hand holds or hand rails for easy access. When needed, recommend that such means of easy access be provided to facilitate the necessary cleaning of special accessory fittings and sight glasses.

The 3-A Sanitary Standards for the various types of milk storage tanks all require agitators to be removable or accessible for manual cleaning, or designed for mechanical cleaning. Also, the annular opening around the agitator shaft shall be protected by an umbrella or drip shield of sanitary design.

Tanks that have nonremovable type agitators with old style packing glands are unsatisfactory, recommend conversion to easily removable couplings and a sanitary type seal for easy removal and cleaning. When this type of seal or agitator is noted in the product contact zone of vats, tanks, or other dairy equipment used for fluid products it shall be considered a category B deficiency.

When vertical type agitators are located out-of-doors, check that the annular opening for the shaft is adequately protected against entrance of contaminants. Tanks constructed to the 3-A Sanitary Standards are required to have a sanitary seal at this area. If the shaft opening is not suitably protected against the entrance of dust, moisture, insects, oil or grease, recommend correction.

Top mounted agitators may be effectively cleaned in place or may require dismantling for hand brushing, depending upon design. If there is a sleeve coupling located within the tank, daily dismantling is necessary. Such couplings cannot be cleaned by spray-ball tank cleaning procedures and should be removed for inspection during each survey. Inspect all parts carefully for condition and sanitation, including any bottom bushings or guides.

The inspection of the top mounted agitators may require entering the tank. As with all equipment that is entered for inspection, exercise extreme caution and follow the plants confined space entry program (see the guidelines for Section I Item P). Do not enter the equipment without a positive lock on the starting switches and controls. After inspecting, remind management that the tank will have to be recleaned and rinsed before use (sanitizing raw product storage tanks is a “should” item of §58.146a).

When the face of a horizontal tank is bulkheaded through a processing room wall, the tank vent fittings should be located within the room for easy access for cleaning. When located outdoors, recommend that such opening(s) be closed and a new vent installed inside the plant.

Pfaudler 45° outlet valves are satisfactory only if they are in good condition, can be easily dismantled, and are being taken apart daily for hand brushing. Proper cleaning of this type of valve requires removal of the entire valve assembly from the tank. Describe any deficiencies.

Remove manhole gaskets and sight and light port gaskets to inspect for condition and cleanliness. Describe any deficiencies and make appropriate recommendations. Gaskets that are cut, checked, or otherwise deteriorated should be replaced.

If the tank is cleaned manually, adequate lighting inside the tank is necessary. Such lighting is usually provided by a light source shining through a top front light port. When missing, recommend providing adequate lighting.

When the tank is mechanically cleaned, the solution recirculating system is not required to have automatic temperature control or a recording thermometer. The milk contact surfaces are available for inspection after the cleaning procedure, so these extra safeguards are not mandatory. Nevertheless, many companies supply them for added assurance of uniform mechanical cleaning conditions.

Note:

> The automatic temperature control and recorder are required when product pipelines are cleaned in place along with the mechanical cleaning of the tank. Review guidelines for Item A32–CIP System(s).

Mechanical cleaning of tanks is usually effective only on the liner surfaces; special accessory fittings must be cleaned by dismantling and hand brushing. Inspect all such fittings carefully.

If tank spray cleaning devices are permanently mounted, any pipeline joints inside the tank should be welded or be fastened with specially designed loose joints that will clean in place. Hex nut or clamp type pipeline fittings are not satisfactory for this purpose. Check that spray cleaning devices are clean and free of debris. Where plugging of spray devices is a problem, a strainer in the solution recirculating system should be recommended.

Direct reading gauges of the transparent glass or plastic type are satisfactory if they are 1) readily accessible for cleaning or are designed for mechanical cleaning, and 2) constructed so that all product in the gauge may be discarded rather than reentering the tank. Check that such gauges are maintained in clean condition. See the fabrication section of the *3-A Sanitary Standards for Storage Tanks for Milk and Milk Products, Number 01-* for design and construction criteria applicable to direct reading gauges.

Existing glass-lined tanks are acceptable only when the glass surface is in good condition, free of cracked, chipped or rusty areas. Check particularly at points where valve or accessory

fittings are fastened. Repair of damaged glass surfaces has not proved satisfactory, so when unsatisfactory conditions are noted, recommend replacement with a stainless steel tank that complies with the applicable 3-A Sanitary Standards.

Fiberglass or plastic are not acceptable construction materials for linings of tanks to be used for milk, cream, whey or other fluid dairy products. The applicable 3-A Sanitary Standards require stainless steel construction for such product contact surfaces. If fiberglass or plastic construction is noted recommend replacement with "3-A" tanks. Do not criticize good condition fiberglass construction for tanks for handling brine, brine and cheese, cleaning compounds (caustic, acids, etc.), water, liquid sweeteners, jackets of tanks, etc.

Item A30—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7–Housekeeping.

General Items

Item A31—Source Ingredients (58.101d, 58.141).

A. Dairy Products.

Approval of some dairy manufacturing operations requires approval of their regular source plants for dairy ingredients.

Examples:

a. Milk receiving stations which receive can or bulk milk into a plant for cooling (when necessary), temporary storage, and shipment to a manufactured products plant which wishes USDA approval. Milk transfer stations are also subject to inspection.

b. Plants which supply any dairy ingredient used to standardize a products composition.

c. Condensing operations which ship product to a central drying plant, evaporated milk plant, or cheese plant.

d. Cheese factories which ship whey, condensed whey, sweet cream, or whey cream to an approved plant for further processing.

e. Buttermilk sources for manufacturing of dry buttermilk.

f. Cream sources for butter plants.

g. Lactose manufacturing plants which ship product to an approved plant for further processing or for use as an ingredient or flow agent for instantizing. plants which package lactose under a “P” code are not approved sources.

Such source plants shall be USDA inspected and approved. Receiving dairy products from unapproved or “P” code plants shall be considered a category A deficiency for the processing plant which receives the raw material unless the product is covered by a USDA certificate. Show this item as unsatisfactory and recommend that dairy products be obtained only from USDA approved plants. Following the recommendation, show information about the unapproved sources, amount of products received, etc. This requirement is not intended to apply to occasional or irregular inter-plant shipments of milk caused by strikes, equipment breakdowns, etc., as explained below.

An exception is made to the above policy for finished products containing foreign casein or caseinate. Such products may be approved for the “S” or “P” code, whichever is appropriate.

When the plant is receiving products such as cheese, butter, butteroil, nonfat dry milk, lactose, MPC (milk protein concentrate), TMP (total milk proteinate), etc. from unapproved sources (including foreign countries) for distribution, further processing, or repackaging, the plant may not be approved for official grading service for that product code nor for any product code that could contain the unapproved dairy ingredient. However, a "P" code approval can be assigned provided the facilities satisfactorily comply with the appropriate plant survey requirements and the products are being satisfactorily handled during processing. In this case assign the INELIGIBLE status to all the codes affected by the unapproved ingredients and assign status for the appropriate "P" code.

Note:

> Source plants for dairy ingredients need not be USDA approved when the plant desires only "P" code approval. Under those circumstances, of course, the resulting finished product may not be officially graded without continuous inspection. See Section I, Item G for further details.
>
> All products from unapproved sources in "P" code plants must also comply with the wholesomeness requirements as outlined under Item A34–Sanitary Practices below.

To avoid inspection duplication, properly labeled bulk shipments of milk, cream, or other dairy ingredients from Grade A plants on the IMS list are generally exempt from the above-mentioned requirement. For bulk products to be properly labeled, the bill of lading shall declare the product to be Grade A. Such products are produced under a "comparable or higher" quality program as provided under §58.141 and waiving the USDA inspection avoids unnecessary duplication of plant inspections. There may be instances however, where the Grade A dairy products quality deteriorates after it leaves the quality purview of the Grade A authorities as "surplus product." The quality may suffer because of aging, excessive handling, warming, transport in unclean tankers, or addition of milk from degraded Grade A producers. When there are quality problems with Grade A dairy products received at USDA inspected manufacturing plants, the National Field Director may require USDA inspection of the source plant. Such surveys would be limited mainly to the Grade A plant areas and functions concerned with the surplus products.

§58.101d also permits the receipt of occasional shipments of bulk milk from unapproved sources, provided that the milk is tested and meets the quality requirements. A bacteria test, in addition to the required antibiotic test, on each tanker load of such milk would suffice. The DMC test is suggested for minimum holdup of the truck. Milk shipments with DMC results of one million or lower may be accepted. Check the outside receiving records for the previous two to three weeks and determine if there were any occasional shipments of milk from unapproved plants. If so, determine if they were tested. If such shipments are being received into the plant without prior testing, Item A19–Raw Products Testing is unsatisfactory, recommend that bacteria testing be required prior to unloading future occasional shipments of milk from unapproved sources.

The quality of dairy products from approved supply plants should not be overlooked. Examine the manufacturing plant records to determine quality of dairy products received from supply plants. When the manufacturing plant is not testing dairy products from supply plants for quality, show as unsatisfactory and recommend that a testing program be started and test records maintained. The plant records should show source of products, date received, temperature when received, and results of tests. Unsatisfactory test results should be reported to the shipper for appropriate follow-up (see the guidelines for Item A19–Raw Products Testing).

Quality tests on milk from receiving stations for bacteria should be at a frequency necessary to assure receipt of satisfactory quality milk. The need for testing may vary considerably. When the milk source exhibits erratic bacterial quality, sampling and testing of each tanker load would be appropriate. However, when a supply plant has a good quality history, less intensive sampling and testing, perhaps twice weekly, may be sufficient. Some manufacturing plants do not receive milk from their own producers but instead order it as needed from a broker, milk pool, or producer association. Often such milk is Grade A and is hauled direct from the producers. When milk from a supply source has been of consistently satisfactory quality, only occasional spot check testing would suffice.

Review plant records for the bacteria tests performed on tanker milk received during the previous week. If all results are below one million, check the item satisfactory. Showing of tanker test results on the report is not necessary unless to support a recommendation for improving milk quality. For example; “Arrange for improvement of quality of milk received from Red & White Milk Haulers. (Four of eleven tankers received June 1-8 had DMC in excess of one million).”

B. Nondairy Ingredients.

Most dairy plants use common nondairy ingredients allowed by the FDA such as salt, rennet, starter distillate, food grade acid, processing aids, etc.

If other ingredients such as herbs, meat products, or other flavors are used, check that they are properly handled and that they do not emit strong odors that might affect dairy products. A plant that uses nondairy ingredients that are incompatible with dairy operations because of color or odor shall provide a comprehensive quality manual detailing the steps that will be taken to prevent cross contamination between dairy products and other products. A copy of the quality manual shall be sent to the Washington Office. If you encounter this situation during a survey, contact the National Field Office or the Washington Office to determine if this requirement has been met. If this requirement has not been met assign the deficiency to category C.

Item A32—CIP System(s) (58.128a, 58.146a).

CIP cleaning, if used for pipelines, shall comply with the *3-A Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems, Used in Milk and*

Milk Product Processing Plants, Number 605-. When equipment is mechanically cleaned by recirculation or spray devices, any recommendations about the effectiveness of such cleaning should be shown on the report under the item number covering the equipment.

Study the 3-A Accepted Practice so you will be thoroughly familiar with the requirements. Check especially for the following deficiencies which are frequently encountered in CIP pipeline cleaning systems (deficiency categories shown should be considered guidelines, the actual category assigned during the survey may be different depending on the severity of the deficiency):

1. Use of conventional fittings rather than the required CIP fittings or welded joints (category D if the fittings are clean).

2. Failure to provide slope for drainage (category D deficiency).

3. Inadequate pipeline supports, use of wire for supports or supports too far apart allowing sags, etc. (category D deficiency).

4. Supports should not allow electrolytic action between support and pipeline. Supports may be made of stainless steel, or should have rubber or plastic contact points with the pipeline (category D deficiency).

5. No automatic temperature control for solution (category C deficiency), although this is required for pipelines it is optional for storage tanks.

6. No recording thermometer (category C deficiency), type of recorder required is outlined in section F.4 of the 3-A document.

7. Poor condition gaskets and dirty exterior surfaces (category D deficiency). Even CIP pipelines should be dismantled occasionally to check gasket condition and to clean outside surfaces, frequency of dismantling may vary considerable from plant to plant depending on type of gaskets, product, and environmental conditions.

8. Inadequate solution velocity. This is usually caused by improper sizing of the recirculating pump. When solution velocity is suspected as a cause of inadequate CIP cleaning, refer management to the simple method of determining velocity as outlined in the 3-A Accepted Practices. The time required to fill a ten-gallon can with solution through a given pipe size will indicate solution velocity (should be at least 5 ft. per second) (category of deficiency depends on actual cleaning performance).

9. Failure to monitor cleaning effectiveness (category of deficiency depends on actual cleaning performance).

These or any other 3-A noncompliance items should be checked unsatisfactory and appropriate recommendation made. Unless specific problems are involved, do not show information on the report pertaining to the actual time-temperature cleaning cycle being used.

To achieve satisfactory cleaning and to prevent pipeline corrosion, the recommendations of the cleaning compound manufacturer should be followed with respect to time, temperature, and concentration of cleaning and sanitizing solutions. Do not show information on the report about actual time-temperature treatments being used unless needed to illustrate specific problems. When cleaning deficiencies are evident, recommend that the CIP cleaning procedures be revised immediately to obtain satisfactory cleaning performance and that pipelines be inspected daily after CIP cleaning until a history of satisfactory cleaning has been established.

Storage and piping facilities for cleaning solutions shall include adequate safeguards to prevent mixing of solutions with food products. When it is necessary to clean pipelines while milk is stored in adjacent tanks, pipes, or other equipment, any cross connections should be dismantled or the CIP system should have other effective controls to prevent accidental mixing with the milk. Separation of cleaning solution from the product is usually achieved by provision of "make-break" connections for hookup, swing type elbows, separate solution return pipelines, electrical interlocks which prevent operation if improperly connected, block-and-bleed systems (see the guidelines for Item A3–Pumps, Pipelines, & Valves), etc. When adequate safeguards are not used, recommend correction. When you are in doubt about a system, study the details carefully and discuss them with your supervisor for guidance.

Hex-nut fittings which have had the bevel-seat regrooved to use self-positioning gaskets and form joints with a substantially smooth, flush interior surface are acceptable as CIP fittings. However, when such fittings are used, it is extremely important that any conventional hex-nut, bevel seat fittings are dismantled for hand cleaning. Since the bevel-seat fittings cannot be distinguished from the regrooved CIP fittings by exterior appearance, circuit drawings should be posted to clearly indicate to plant employees (and the inspector) which fittings are to be cleaned in place and which require daily hand cleaning. Inspect non-CIP fittings for cleanliness, also inspect some regrooved CIP fittings for condition of CIP gaskets and for regrooving workmanship. When applicable make recommendations for correction.

Notes:

a. John Perry fittings are acceptable CIP type fittings. These are hex-nut type fittings which have factory-made, CIP type, gasketed, seats. (Field regrooving not necessary.) However, since these fittings cannot be distinguished from conventional bevel seat fittings by exterior appearance, the posting of CIP circuit details and inspection of fittings should be as outlined above for regrooved hex nut fittings.

b. Heat resistant glass (Pyrex) is an acceptable "3-A" construction material for CIP pipelines.

c. Automatic programming of the CIP regimen for pipelines is not a 3-A nor a USDA requirement. Provision of such equipment is optional (except for membrane systems). When the regimen is manually controlled, the recorder charts provide evidence of the times and temperatures actually employed.

The 3-A Accepted Practices require that a drawing showing details of each circuit and a description of the cleaning regimen "be made available by the processor." When the CIP circuit(s) is large and complex, you may request provision of such drawing to aid in making the inspection. Posting of such drawings and procedures for use by employees should also be recommended when inspection reveals erratic cleaning performance, or lack of uniformity by employees in following the correct cleaning regimen.

For cleaning pipelines in place, the 3-A Accepted Practices requires a recording thermometer. Applicable specifications for the thermometer are outlined in the practice. These specifications are not met in all respects by an HTST pasteurizer recorder, nevertheless, this recorder will suffice to monitor CIP cleaning of the pasteurizer and the pipes that are cleaned in the same circuit with the pasteurizer. When the pasteurizer cleaning circuit includes a very long flow diversion line or other additional piping unrelated to the pasteurizer, recommend provision of a separate recorder meeting specifications of the applicable section of the 3-A Accepted Practices and that its sensor be placed at the coolest part of the circuit.

Cleaning solution tanks must be made of stainless steel or suitable, equally corrosion-resistant metal. Interior finish may be No. 2B mill finish (unpolished) or may be polished to No. 4 finish with 150 grit silicon carbide. There is no guidance in the 3-A Accepted Practices concerning covers for solution tanks. Covers are optional but recommended unless the tanks are located in an area where additional protection against contamination is needed. In such instance, recommend provision of covers.

The 3-A Accepted Practices has no requirement for a strainer or filter in the solution circuit. However, if inspection of cleaned pipelines reveals extraneous material such as filter or gasket particles, brush bristles, etc., recommend installation of a strainer to retain such debris. If a strainer is provided, a handy location should be chosen to facilitate periodic cleaning.

The 3-A Accepted Practices outlines the criteria for solution contact surfaces. These criteria are not materially different from the criteria for product contact surfaces. Dairy Grading Branch interpretation of these criteria is that all solution contact surfaces, except those castings identified in section D.3.1 (revision 605-04), shall be the equivalent to product contact surface criteria. The listed exception is for cast stainless steel surfaces on heat exchangers, steam injectors, and pumps. These cast surfaces are somewhat rougher than a No. 4 finish. Routine inspection of this equipment not required during USDA plant surveys.

Item A33—Storage of Supplies (58.126e, 58.153, 58.241d).

Check construction, lighting and ventilation in the supply room or area. Give specific attention to see that the area is protected against entrance of rodents or insects. Doors and openings shall be fitted tightly and floors kept in good repair. Storage room floors where new containers and supplies, packaged dry products, or equipment is stored can be constructed of sound, smooth wood that can be kept clean.

A. Salt, Color, Starter, Rennet, etc. (58.126e).

These and other product ingredients shall be properly stored in a clean, dry room or area and protected against contamination. Storage of starter, color, and rennet in the cheese cooler is a satisfactory practice.

If other ingredients such as fruits, nuts, herbs, or other flavors are used, check that they are properly handled and stored so that they do not emit strong odors that might affect dairy products and that they do not adversely impact the dairy processing environment. These items should be stored in a separate room or area. The packages should be tightly sealed between uses.

B. Containers, Liners, Wrappers, etc. (58.241d).

Check for sound construction of floors, walls, ceiling, doors, windows, etc. The room should be clean and dry and construction of the room, and fitting of doors should provide protection against rodent entrance.

Packaging materials shall be stored in their original protective container or wrapper until needed. Partially used, open containers shall be covered or resealed to protect supplies in the container from contamination.

Materials should be stored in an orderly manner on pallets, floor racks or shelves.

There shall be no space type fogging spraying for insects in the room which might contaminate the packaging supply.

C. Housekeeping (58.126e, 58.153).

Check that all supplies are stored in a neat orderly way and are so arranged on racks, shelves, or pallets to permit access to the supplies and allow cleaning and inspection of the room. Empty containers, unused items, or obsolete supplies should be disposed of.

D. Pesticides and Other Chemicals (58.153).

Check that insecticides, rodenticides, cleaning compounds, and other similar nonfood products are properly labeled, segregated, and stored in a separate room or cabinet away from milk, dairy products, ingredients, or packaging supplies.

Item A34—Sanitary Practices (58.101e, 58.124, 58.129, 58.142, 58.145, 58.146a).

See the guidelines for Section III B. Processing Unwholesome Products.

A. Employee Sanitary Practices (58.129).

All employees shall wash their hands before beginning work and upon returning to work after using toilet facilities, eating, smoking or otherwise soiling their hands. They shall keep their hands clean and follow good hygienic practices while on duty. Expectorating or use of tobacco in any form shall be prohibited in each room and compartment where any milk, dairy products, or supplies are prepared, stored or otherwise handled. Examples of other unhygienic practices include: holding sanitary gaskets with the teeth, washing parts or equipment directly on the floor, and drinking from a water hose used for sanitary purposes (category C deficiencies). In the latter instance, check that the plant has provided sanitary drinking water facilities at convenient locations as required by §58.131b.

Clean white or light-colored washable or disposable outer garments and caps (paper caps, hard hats, or hair nets acceptable) shall be worn by all persons engaged in receiving, testing processing milk, manufacturing, packaging or handling dairy products. However, recommend that employees with long hair wear hair nets to completely envelop the long strands. Similarly, when facial hair is long enough to be considered a beard, recommend that a net or other suitable restraint be worn

B. Equipment Sanitizing Practices (58.101e, 58.146a).

Sanitizing is the application of steam, hot water, hot air, or other acceptable sanitizer solution of sufficient strength for an adequate time to effectively destroy all microorganisms on a clean product contact surface.

Food and Drug Administration (FDA) regulations applicable to sanitizing solutions are outlined in 21 CFR 178.1010, which lists the chemical names and combinations of chemicals that are suitable for use on food contact surfaces (the *General Specifications* reference 21 CFR 121.2547, which is not correct). In addition to compliance with FDA regulations, the manufacturer and seller of sanitizing solutions must register the formulation and labeling with the Environmental Protection Agency (EPA). The presence of an EPA registration number on the labeling therefore indicates that the product may safely be used as indicated by label instructions.

Pasteurized product contact surfaces shall be sanitized immediately prior to starting product flow. If this is not being done, recommend that a regular practice of sanitizing be initiated. Recommend sanitizing raw product contact surfaces of equipment after cleaning or just before use (a “should” item of §58.146).

Sanitizing with hot water shall involve at least five minutes contact with water 170° F or higher.

A specific sanitizing regimen is not required for spray dryers which are only dry cleaned between dryer runs. When wet cleaning is performed, check that thorough cleaning is achieved and that the drying system is thoroughly dried out immediately afterward. This can

be accomplished by running the fans for a short period, using heat if necessary. Additional use of chemical sanitizing solutions is optional.

Equipment used for pasteurized fluid products that has been used and then sits idle for 2 hours or more shall be rewashed and sanitized prior to being reused. Equipment for processing butter that has been used and then sits idle for 2 hours or more should be rewashed and sanitized prior to being reused. Equipment for processing dry products should be vacuumed or brushed clean prior to being reused.

If plant employees are observed washing or rinsing parts on the floor assign the deficiency to category C. Recommend the use of mats, buckets, racks, carts, etc.

C. Product Handling Practices (58.145).

It shall be considered a category A deficiency when the survey reveals conditions whereby the product has been contaminated by foreign materials or where unwholesome products are processed or added to products processed for human consumption. Such conditions could be related to building deficiencies, unsatisfactory equipment, or operation practices.

Examples:

a. Leaking seals in an overhead agitator of a cheese vat that has allowed grease or oil to enter the product.

b. A serious condensation problem on the ceiling or overhead service lines that drips into an open cheese vat.

c. Equipment leaks, which allow cow water or other nonfood fluids to mix with the product.

d. Unsanitary handling or production practices which contaminates the product.

e. Floor scrapings from either butter packaging or cheese cutting operations being utilized for butter, butteroil, or process cheese production.

f. Reprocessing for human food of contaminated product containing grease, dirt, filth, or insects.

g. Use of moldy butter or bulk cheese for further processing without prior cleaning.

h. Use of salt or other ingredients contaminated with foreign material.

These deficiencies should be recorded under the appropriate item number. Therefore, example a would be recorded under Item C23–Make Vats & Agitators.

When the plant desires only "P" code approval, source plants for dairy ingredients need not be USDA approved. However, in any instance where products that have been rendered unwholesome are utilized for human food, regardless of the source of the products, the "P" code approval shall be denied and the INELIGIBLE status assigned.

Manufacturing and packaging operations of butter and cheese often result in a certain amount of "rework" such as butter or cheese which has seeped from forming heads or adheres to cutting frames, which has not been contaminated with unwholesome substances. This product can be reclaimed for human food and shall be clearly identified as product for human consumption.

Scrap that has been contaminated, comes in contact with floors, or has been removed during bulk product cleaning operations cannot be reclaimed for human consumption and shall be labeled as not for Human Consumption. If the scrap is not clearly labeled assign the deficiency to category C. Scrap shall be removed from the production area regularly. The waste shall be stored in an area or room in a sanitary manner and separate from edible butter, rework, cheese, or trim until disposal or removal from the plant. When handling, storage, or disposition of scrap is unsatisfactory, recommend corrective measures and assign the deficiency to the appropriate category. Reuse of the scrap as human food shall be considered a category A deficiency.

D. Sanitary Facilities (58.126e, 58.127c).

Hand washing facilities shall be provided. They shall be convenient, and they shall include hot and cold running water, soap, and sanitary single service towels or air driers.

All employees shall be furnished with a locker or other suitable facility where clothes may be changed and stored in an orderly manner. If there are any unused lockers, check them for cleanliness and evidence of trash, unused supplies, roaches, or other insects. When a laundry service is supplied or performed at the plant, the dirty laundry shall be kept in suitable containers.

When employees eat on the premises, encourage the provision of a lunchroom or special eating area (not mandatory). Check that such facilities are kept clean and orderly and have posted signs directing employees to wash their hands before returning to work.

Any windows that can be opened shall be screened.

Doors to the rest rooms shall be self-closing and fixtures kept clean and in good repair. Also, check that the facilities are conveniently located and review construction and maintenance of floors, walls, ceiling, etc. Toilet rooms shall not open directly into any room in which milk or dairy products are processed, manufactured, packaged, or stored. Legible signs shall be posted in each toilet or dressing room directing employees to wash their hands before returning to work.

Note:

Some companies prefer to locate the hand washing facilities directly outside of the rest room as this location affords better opportunity to supervise that hand washing is performed. There is no objection to this location provided that all the requirements above are met.

Item A35—Product Rinsings (58.145).

Show NA for this item if the product rinsings are not saved or if they are recovered and not used for human food. When rinsings are saved for other than human food, the lines, pumps, and tanks need not be of sanitary construction, but this equipment should be maintained clean and not contribute to unsatisfactory sanitation, odors, insect control, or contamination in the processing rooms.

If compressed air is used to "blow down" either product or product rinsings, it shall have been produced in compliance with the *3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products, and Product Contact Surfaces, Number 604-* .

Inspect the recovery and storage system for compliance with these conditions:

1. All water used in the recovery of product rinsings shall be potable water or meet the requirements of process water (see the guidelines for Item A38–Water Supplies & Handling).

2 Pipelines, pumps, and equipment used for conveying rinsings from product lines or equipment to the rinsings storage tank shall comply with the applicable 3-A Sanitary Standards requirements, including the *3-A Accepted Practices for Permanently Installed Sanitary Product–Pipelines and Cleaning Systems, Used in Milk and Milk Processing Plants, Number 605-* for cleaning these transfer pipelines in place.

3. Product rinsings storage tanks shall be stainless steel and comply with the applicable 3-A Sanitary Standards requirements.

4. Rinsings from raw milk or milk products shall not be stored in the same tank as rinsings from pasteurized milk or milk products, in order to avoid quality problems. However, storage in the same tank would be permitted if the mixture were promptly pasteurized or suitably heat-treated to deactivate lipase. Should the plant wish to use this option in order to avoid having separate tanks, determine all relevant information about the kind of rinsings, percent fat content, percent total solids, kind of heat-treating or pasteurizing equipment, treatment time and temperature etc. Raw whey and pasteurized whey rinsings may be stored in the same tank.

5. Rinsings from milk or milk products shall be handled in a sanitary manner to preclude bacteriological growth and be stored at 45° F or lower.

Raw or pasteurized whey rinsings shall be similarly handled and shall be stored at 45° F or lower, or at 145° F or higher.

The applicable storage temperature requirements may be waived if the milk or whey rinsings are promptly utilized, within 1 hour after collection, in a food product.

6. Product rinsings held in storage tanks shall be pasteurized prior to being adding to any product for further processing into a finished product.

   In the event the plant wishes to add the rinsings directly to a product and then immediately pasteurize the mixture, obtain all details on the product flow and telephone the information to the National Field Director.

7. Product rinsings shall be collected as soon as practical after the product pipelines and equipment are emptied. Thereafter, the rinsings shall be handled and processed in such manner as to preclude quality problems in the finished product. If quality problems develop, the rinsings shall not be used for human food.

8. Branch tees and stubs from equipment to lines shall be kept short so as to assure adequate rinsing.

9. There shall be adequate control measures to assure proper flow to completely rinse the product from equipment and lines. Proper sizing of the pump to fill the lines, sufficient water pressure if flow is induced by potable water system pressure, sufficient rinsing time, etc.

10. The potable water supply of the plant shall be safeguarded against the introduction of product and product rinsings. This can be achieved by introducing potable water to the system only by methods permitted by the applicable plumbing code for the plant (two pipe diameters of open space between the supply line and the storage tank or use of a backflow preventer are the two most common methods).

11. The rinsings recovery system shall be designed and operated to preclude accidental commingling of cleaning or sanitizing solutions with the product rinsings.

12. CIP or mechanical cleaning equipment, such as acid and alkaline cleaner solution tanks, outlet manifold piping at such tanks, and the primary solution circulating pump, shall not be used for potable water for product rinsings recovery and such equipment shall be completely separated by a physical break or a block-and-bleed system (see the guidelines for block-and-bleed systems in Item A3–Pumps, Pipelines, & Valves). Use of this equipment is precluded because of the danger of product contamination with cleaning compound residues.

    However, there is no objection to using the water rinse tank of a CIP or mechanical cleaning system for storing potable water for recovery of product rinsings. (This would require an additional water pump in most instances since the solution circulating pump

may not be used.) Likewise, cleaning solution pipelines meeting the 3-A Accepted Practices and spray devices in equipment may be utilized for conveying the potable water to equipment or product pipelines for collecting product rinsings. (In such case, the potable water could originate from a pump at the water rinse tank of a CIP system or it might be introduced from a separate potable water line for distribution by water system pressure.)

13. In lieu of an automated or partially automated system for recovery of product rinsings, a potable water hose may be used to manually rinse bulk truck tankers, vats, storage tanks, etc., however, all preceding conditions in this instruction shall be followed.

14. The rinsings recovery system will be subject to inspection at each plant survey. Any problems with adulteration, public health, or quality of the finished product shall cause disapproval of the system. The inspector shall thoroughly review the plants system for such potential problems.

In addition, do not criticize the practice of "chasing" raw products with a potable water rinse as soon as the equipment or tank is empty (where a holding tank for the rinsings is not utilized). If the rinsings enter a storage tank, they shall be pasteurized prior to adding them back into product (see number 6 above).

In instances where a product line is used intermittently throughout the day, a plant may rinse, with potable water, directly into a raw product vessel. For example, if a fines return line is rinsed every two hours with potable water, the water/fines mixture can go to the drain table, into a mixer/moulder, or cooker.

If a sanitizer is used, the rinsing shall go to the drain. In this instance they cannot be recovered for use in human food. Chlorine is often used to disinfect potable water supplies (at 2-5 ppm), however as a sanitizer the level is generally high enough to be readily detectable (100-200 ppm). If the plant is adding chlorine to the rinse water so that the level is above 10 ppm, recommend that they discontinue the practice or divert the rinse to the drain. If immediate corrective action is taken, assign the deficiency to category D. If the plant cannot or will not discontinue rinsing with sanitizer, assign the APPROVED 3-MONTHS status (category B deficiency). Failure to take corrective actions will result in the INELIGIBLE status (category A deficiency).

It is expected that utilization of product rinsings for human food will be a growing practice to avoid wasting suitable food and to reduce environmental disposal problems. When you encounter such systems, keep the National Field Director informed about the procedures employed, so that these guidelines can be periodically reviewed and updated as necessary.

Item A36—Culinary Steam (58.127d).

General Specifications, §58.127d, provides that culinary steam may be produced by 1) boiling soft water in a secondary steam generator or "reboiler," or by 2) using only certain boiler water

treatment compounds and following a system of steam purification per recommendations of the National Association of Dairy Equipment Manufacturers.

Although it is satisfactory, the first mentioned reboiler method is not widely used in the dairy industry.

The steam purification procedure referenced above has been superseded by the new *3-A Accepted Practices for a Method of Producing Steam of Culinary Quality, Number 609-*. Use it as your guide in checking new culinary steam installations. Existing installations which meet the former recommendations of the National Association of Dairy Equipment Manufacturers should be considered satisfactory because they are quite similar. However, in discussions with management, recommend that the 3-A Accepted Practices be followed when any changes or new installations are made.

Here is a brief review of basic requirements for culinary steam systems to meet the 3-A Accepted Practices:

1. When the boiler feed water is treated with chemicals, only those nontoxic compounds listed in FDA regulations, 21 CFR part 173.310 (which supersedes 21 CFR 121.1088 mentioned in the general specifications), may be used. Use of "soft" boiler feed water without boiler water additives is also satisfactory to make culinary steam. Such soft boiler feed water can be:

   - from a naturally soft supply
   - softened by an ion exchange or membrane process
   - steam condensate collected from heating equipment in the plant
   - suitable quality cow water from milk product evaporators.

   If boiler water compounds are used, management should present a certification from the boiler water compound manufacturer that the compounds used comply with applicable requirements for steam which will be in contact with milk and milk products. Such certification may be in the form of a letter, or a statement on the product label or invoice. Check that the certification corresponds with the compounds actually in use. If management has no certification and is using steam for culinary purposes, check this item unsatisfactory and recommend that a compliance statement be obtained.

Note:

The *"List of Chemical Compounds Authorized for use under USDA Poultry, Meat, Rabbit, and Egg Products Inspection Programs"* is not helpful in determining suitability of boiler water additives for dairy use. Certain additives are permitted in boiler water for steam for contact with "food" which are not allowed if the steam is to contact milk or milk products.

2. Piping, trapping, strainers, etc. shall comply with the text and illustrations of the 3-A Accepted Practices. When deficiencies are noted, recommend correction.

A. Uses That Require Culinary Steam:

1. Steam injection into product hot wells for production of evaporated milk, sweetened condensed milk, NDM, etc.

2. Making Ricotta cheese with direct steam injection.

3. Steam injection into heating chamber of continuous pasteurizing or sterilizing equipment.

4. For direct heating of cheese in a process cheese cooker.

5. For direct injection heating of water to be recirculated in a continuous type Mozzarella curd mixer.

6. For direct injection heating of water to be added to melted butter in melting vats or at the separator during the manufacture of butter oil.

7. Any heating application where steam contacts the product.

B. Incidental Uses That Do Not Require Culinary Steam

1. Direct injection heating of CIP Tanks.

2. Direct injection heating of brine for treating parchment butter box liners.

3. Warm water from a steam-water hose station for rinsing of make vats.

4. For creating high humidity conditions in continuous salters for cheese curd.

5. For direct injection heating of water to make up neutralizer solutions for cream or other dairy products.

6. Steam sanitizing of pipes, tanks, etc., as often practiced in the manufacture of sweetened condensed milk.

7. Any use where there is no steam contact with the milk or dairy products.

For such incidental steam uses, the plant shall, as a minimum,

1. Use only those boiler water treatment chemicals which comply with FDA regulations, 21 CFR part 173.310, when the steam contacts dairy products.

2. Incorporate provision for purging the steam line. Just prior to use, the steam line should be opened for a short time to purge out any accumulated condensate or rust to the floor. For some systems which have rigid steam piping direct to the point of use, a separate

bypass line and close-coupled shut-off valve will be necessary to accomplish such purging. Of course, the section of rigid piping which directs the steam into the product or product vessel must be made of stainless steel. The purging bypass and its valve should be located in the beginning of the stainless steel section or just upstream of it.

3. Occasionally the plant should check the suitability (cleanliness) of the steam at the point(s) of incidental use. One way of checking is to purge the line, then direct the steam into a bucket of clean cold water for approximately 5 minutes. Inspect the water for an oil "sheen, floating debris, odor, and perform a sediment test using the same procedures as for milk.

In case of doubt as to whether culinary steam is required or whether the "incidental steam use" requirements would apply for a specific use which is not mentioned here, contact the National Field Director for guidance.

Item A37—Pest Control (58.147, 58.211, 58.247).

Insect Control in Dairy Manufacturing Plants.

An effective program includes designating the responsibility of insect control to a specific employee. This employee should be trained and have general knowledge of insects, inspection and control procedures and proper insecticide application methods. This employee may manage all control efforts or oversee a commercial firm hired to aid in handling this responsibility. A primary concern is that approved insecticides are used in the proper areas and that application methods do not contaminate the product, equipment or packaging materials.

Although the goal should be insect-free conditions, particularly in processing rooms or areas, it is recognized that this goal may not be entirely attainable. Primary emphasis is to be placed on an effective pest control program which includes the following:

1. Maintaining clean premises which are substantially free of insect breeding places or harborages. These may include weeds, standing water, and dirty or uncovered waste containers.

2. Sound building construction, tight-fitting doors and windows, screening of such openings, self-closing exterior doors, and use of air screens, streamers or other devices for keeping insects out. In addition, screen doors should open outward.

3. Use of intervention systems and killing insects outside the plant by using attractant baits, traps, electrical fly killers, etc.

4. Good housekeeping and cleaning practices to limit food supply. This includes timely waste removal during production, periodic cleaning of ceiling beams, light fixtures, and pipelines, keeping storage areas neat and clean, rotating supplies, etc.

5. A monitoring program that may include traps, glue strips, etc. This should also include trap cleaning and record keeping.

6. Follow-up procedures when pests are found.

When insects gain entrance despite these precautions, management should take steps to eradicate them. Following are the most commonly used commercial procedures:

A. Use of Insecticides.

The EPA has responsibility for control and proper use of insecticides, rodenticides and fungicides. The enabling legislation is Public Law 92-156, the *Federal Environmental Pesticide Control Act of 1972*. EPA control is exercised over insecticide formulations by a system of required registration, approval, and review of labeling. Only properly registered and approved formulations may be sold and use must be strictly in accordance with the product labeling. Use of pesticides is restricted to "Certified Applicators," whose competence is reviewed under a system of either Federal or State certification as provided under the Act. The main types of insecticides used in dairy plants are as follows:

1. Knockdown type spraying for flying insects.

Such spraying is usually accomplished using steam or air pressure spraying devices or electrically driven "atomizer" fogging units. These so-called "knockdown" sprays, usually containing pyrethrum extracts and/or other materials not having residual killing action, may be used in processing areas during shutdown periods provided that exposed food products are removed or covered during spraying. Also, before processing the equipment and utensils shall be thoroughly cleaned and rinsed with water and should be sanitized to remove all traces of insecticide. Rinsing with water is not sufficient treatment following room spraying. Modern laboratory testing procedures are extremely sensitive in detecting insecticide residues.

2. Spraying or dusting with residual type insecticides (For roaches, silver fish, dermestids, etc.).

In contrast to the non-residual materials, there are residual insecticides which kill insects over a long period of time. A common acceptable way of applying residual insecticides in solution is by use of the pressure type garden sprayer using a wand and fine stream nozzle for specifically directed application into cracks and crevices, behind electrical boxes, etc. Residual type insecticide powders may be applied in cracks and crevices with syringe type devices. Since the insects may be gradually affected, there is danger of dying insects falling into product or product vats, tanks, or other containers. There is no practical way to protect product during processing operations. Therefore, use of residual insecticides is limited to areas where products are never exposed during processing, packaging, handling, storage, etc.

3. Use of automatic insecticide dispensers.

Some aerosol spraying devices are available which automatically release a fine spray of insecticide into the surrounding area from a fixed position in the room. Pressurized cans of insecticide are often used, together with control and timing devices. EPA exercises control over the maximum amount of insecticide which may be emitted by such units during each 15 minute period. These units are usually sold, installed, and serviced by professional pest control companies. Such automatic dispensing systems shall not be used in processing or storage areas when products are being processed or stored in open containers. If automatic dispensers are used in these rooms during times when product is not exposed residual insecticides shall not be used, only the previously specified “knockdown” type insecticides may be used.

As with conventional spraying with these insecticides, exposed food products and packaging materials must be removed from the room or be protected. Afterward, equipment and utensils must be thoroughly cleaned and rinsed with water and should be sanitized before operations are resumed.

Automatic dispensing systems may be used in areas where there is no handling of exposed food without limitation on the time of operation, provided that sufficient precautions are taken to preclude entry of insecticide mist or affected insects into processing or storage areas through open windows, ventilating systems, etc. Under these conditions, either the aforementioned knockdown or the residual type insecticides may be used.

4. Use of baits.

For fly control purposes outside the plant, colored sugar baits made with approved insecticides may be used. Blue or green colors are preferred to clearly distinguish these baits from dairy cleaning compounds or edible food ingredients. Such baits should not be scattered indiscriminately outside the plant because of the danger of being tracked into the plant. Use of pans or other containers located up off the ground are recommended.

For roach control inside the plant, approved insecticide may be mixed with inert materials and be used as insect powders under circumstances which absolutely preclude contact with product. This means that the substances must be used in bait boxes under a system of control whereby strict accounting of all boxes can be accomplished so that all are removed prior to resumption of processing. They may be used in processing areas during shutdown only. The bait material should be colored green or blue. Routine use of baits for roach control is not a recommended practice. Control should be achieved by more conventional means of eliminating harborages, maintaining high level sanitation and proper spraying with residual type insecticides.

B. Use of Electric Fly Killers.

These units consist of a charged grid to electrocute insects which attempt to alight. Some use special wave length lights to attract insects. They may be used outside the plant but are primarily installed inside the plant near doorways and other locations. They may be installed in processing rooms provided that: 1) they are not over nor near open vats or equipment, 2) they are equipped with catch pans for the dead insects, and 3) the catch pans are cleaned regularly. These units have limited effectiveness during daylight conditions but can be very useful in eliminating flying insects when left in operation during nighttime.

C. Use of Vacuum-Type Fly Catchers.

Vacuum-Type Fly Catchers use an attractant light to lure the insects into a fast-moving air stream induced by a fan which deposits the insects into a filter bag. Such units may be used in processing rooms.

D. Fumigation.

Fumigation, with FDA and EPA approved fumigant gas, is sometimes desirable for insect eradication. Perhaps the primary usage in the dairy plant is for cheese mite eradication from cheese drying rooms or storage rooms. Fumigation of Government-owned nonfat dry milk is also employed under certain conditions. Fumigant gas is extremely poisonous to man as well as to vermin: therefore, the entire fumigation procedure is under the direct control of a certified applicator. Effective fumigation requires that the building or room be tightly constructed, any cracks or openings must be taped or sealed, and the area exposed to necessary concentrations of the fumigation gas for a sufficient time to effect kill. The time necessary will vary with the temperature of the room, amount of fumigant used, amount of air circulation, type of commodity, method of storage, kind of insect and many other factors. It is the responsibility of the fumigator to assess these factors and adjust his procedures accordingly to obtain desired results. Usually, fumigation is handled by a certified commercial applicator working for a professional pest control company. It is also the fumigator's responsibility to protect the premises from entry during fumigation and to air out the room or building afterward. Do not enter fumigated rooms or buildings to check effectiveness of fumigation until you are certain it is safe to do so.

Because of the danger and high expense, fumigation should not be considered as a routine insect control method. It should be limited to circumstances where other remedial measures would not be practical or effective. Rather than becoming resigned to “repeat” fumigations, it would be more productive to concentrate on the reasons why the insect infestation occurred and on correcting relevant deficiencies. For instance with mites, effective preventative control can be achieved with proper construction of rooms and shelves, good sanitation practices, maintenance of low humidity conditions, and careful inspection of cheese put into the rooms.

E. Special Considerations for Cheese Mites.

To check for mite infestation, use a magnifying flashlight (5 or 10 power). Check shelves, tables, walls, rusty areas of conveyors, stored cheese, floor sweepings, etc. Also check cheese tables for mites at the liner-jacket overlap, crevices in the agitator attachment, name plate, etc. Cheese mites are small, slow moving, and nearly transparent (somewhat like little sacks of water). If you have any questions contact the National Field Office to discuss your observations.

When live mites are noted, recommend elimination and also show some details about the extent of the infestation. Where the problem is widespread in the room, fumigation is usually employed. Where only a limited area is infested, the affected location may often be treated successfully by scrubbing and hot water treatment. If this is done while the survey is in progress, check the area afterward and show all the relevant information on the report.

Mite infestation is greatly discouraged by sound construction free of crevices, by clean conditions, maintenance of low relative humidity and careful inspection of any aged cheese or used boxes brought into the room. If repeat infestations occur, management would be well advised to correct the basic cause.

F. Special Considerations for Dermestid Insects.

For proper dermestid insect control, frequent use of the heavy duty vacuum cleaner should be made with special attention given to ducts, switch boxes, conduit boxes, motors, conveyors, cabinets, pipes, lights and tops of beams and supports. For further guidance, the following items should be carefully checked:

1. Any overhead ledges, beams, cross-bracing, and skylight areas should be vacuumed and kept reasonably free from dust.

2. Ventilation ducts and air-conditioning units should be mounted to allow sufficient clearance for cleaning.

3. Electrical panels should be mounted flush and sealed around the perimeter or be mounted with spacers about two inches from the wall.

4. Pipe service openings through walls should be smoothly cemented or have metal sleeves and sufficient clearance to facilitate thorough cleaning.

5. Enclosed stair wells which result in “dead space” or use for storage are a potential trouble area. Inspection emphasis should be on good lighting and racks or shelves to facilitate good housekeeping.

6. Vertical ducts are preferable for exhaust of air from dryer or packaging rooms. If horizontal ducts are present, provision should be made for easy access for periodic cleaning of powder dust from inside surfaces.

7. Open pipes which are used for handrails, ladders, etc., should be capped or welded shut at each end.

8. All pilasters and concrete or tile block walls should be sealed on top to prevent dust or insect entrance.

9. Fluorescent lights do not generate much heat and, therefore, may support insect infestation inside the fixture or on top of the reflector. Inspect carefully for powder accumulation or insects. New or replacement fixtures should be sealed type.

10. False ceilings can cause serious problems with dermestid insect control particularly if there are perimeter cracks or other ceiling openings for pipes, pipe supports, service ducts, etc. Such openings can allow powder dust to enter and support dermestid insects in a "protected environment." The larvae and insects can then fall to various areas of the equipment or room below and start secondary infestations.

    If the "false" ceiling space is deep enough to permit worker entry, insect control can be reestablished by vacuuming all areas and then spraying regularly with residual type insecticide. When the false space is shallow, it may be necessary to provide removable access ports for cleaning and spraying, or in some instances, removal of the false ceiling may be required. Exposed beams or joints do not constitute unsatisfactory construction in a dry milk operation. As contrasted to fluid processing rooms, wet cleaning is seldom necessary and there are entirely different circumstances with respect to ventilation and vapors, etc. However, exposed ceiling surfaces preferably should not have horizontal ledges. Such ledges often gather product dust and allow dermestid infestation in much the same way as a false ceiling.

Rodent Control in Dairy Manufacturing Plants.

The basic principles for rodent control are very similar to those outlined for insect control, that is, maintenance of clean premises free of harborages, tight plant construction, rodent proofing exterior openings, use of metal doors and/or metal flashing, etc. Inside the plant, means should be continuously employed to eradicate any rodents which might penetrate the perimeter barriers. Here are some commonly used control methods:

A. Use of Rodenticide Baits.

In general, rodent baits should be used only in nonprocessing areas. The only way they may be used in processing rooms would be during shutdown periods and with strict accounting of the location and number of baits set out. All would have to be removed before operations are resumed.

Baits should not be strewn about loosely or be placed out in open paper saucers or cups. Ideally, they should be dispensed in metal bait boxes, although wooden or solid fiberboard construction would also be satisfactory. If prepackaged baits in paper bags are used, care should be exercised in their placement so that bags are not broken by traffic, forklifts, pallets, etc. The loose bait could be tracked around the plant or cause a messy appearance. Regular plant checking would also be necessary to clean up any bait bags opened by rodents. In short, this bag method of dispensing baits is subject to misuse. If this is noted, recommend that enclosed bait boxes be used.

Rodenticides ordinarily do not have an insecticide effect. Insect infested baits are frequently encountered and this can be a serious problem in dry milk plants when the insects are dermestids. For dry milk plant use, therefore, rodent baits should be specially treated with residual insecticide to avoid this problem. (Light treatment with Malathion is a common practice. Bait acceptance may be somewhat reduced.)

Whether baits are used by a commercial firm or are set out by company personnel, it is important that they be serviced frequently to be effective. Moldy, neglected baits in the wrong location will serve no useful purpose and could constitute a housekeeping and appearance problem.

B. Use of Mechanical Traps.

These may be baited or unbaited, spring-actuated traps which usually kill the rodent. If such traps are used, they must be checked regularly to remove the catch and avoid odor or insect problems. Naturally, if frequent catches are made, extensive checks should be made to review effectiveness of the perimeter control measures or determine if there is a breeding resident population.

C. Use of Windup Type Repeater Mechanical Traps.

These box-like contraptions have a spring-wound, revolving, bladed wheel which kills the rodent and flips it into a closed compartment and is automatically reset to repeat the process.

As with conventional traps, they must be regularly tended. The person responsible should maintain a record of trap placement so they are not inadvertently missed.

Category Assignments

When evidence of insects, rodents, or other vermin is observed during a survey, a full and complete review and evaluation of the pest control program shall be conducted. The pest control program should include two goals. First, to exclude pests from the premises and second, to eliminate all pests that infiltrate the premises. When assigning a category to this deficiency, consideration shall be given to how well the pest control program meets these two goals rather than on specific pests observed in the plant. To be categorized as a category A deficiency an infestation must be present, and there must be a breakdown of the pest control

program. An infestation consists of multiple findings of a pest or pests. In addition, gather all relevant information and contact the National Field Office before discussing status assignments with the plant.

The Dairy Grading Branch has specified the following category assignments for specific deficiencies.

A. Rodents.

Evidence of a rodent infestation in a processing room, or storage areas for product, gaskets, or packaging supplies indicates the plant does not have an effective control program (for example, rodent excreta is found and outside entrances are not effectively protected, premises are cluttered with junk, no in plant controls in use, etc.). Show all relevant details on the survey report and assign this deficiency to category A.

When only isolated evidence of rodents is found in a room that does not open directly into a processing or product storage area (a remote area) and the plant has a good control program, the deficiency can be assigned to category B. In such cases, arrangements shall be made for the immediate removal of all rodent evidence and cleaning of the affected areas.

A rodent found in a bait box or trap indicates the pest control program is effective but more diligent follow-up is required, therefore this deficiency should be assigned to category C. Make a recommendation on the report for increased vigilance with the control program.

B. Flies.

A fly infestation in areas where product is exposed, or flies noted in or on pasteurized product indicates the plant does not have an effective pest control program. Before assigning this deficiency to a category it is important to evaluate the seriousness of the problem (the number and location of the flies), the reason(s) for the presence of the flies (open doors, ineffective screening, etc.), and the immediate corrective measures taken by the plant. If flies are noted in pasteurized product, or if the problem stems from severe shortcomings in the pest control program, assign the deficiency to category A. When a limited number of flies are noted in a processing or packaging area (but not in the product) the deficiency can be assigned to category B or C (category D is applicable only if the problem is in an area remote from exposed products).

C. Roaches.

When a roach infestation is observed in a product processing, packaging, or storage area assign this deficiency to category A. Consideration should be given, however, to the plant insect control program. If live roaches are observed, this obviously indicates inadequate control. If, on the other hand, only isolated instances of dead roaches are noted and the plant has an insect control program, judgement should be used in assigning this deficiency to a category, with emphasis on cleaning up such insect evidence.

D. Cheese mites.

The presence of a cheese mite infestation in a cheese operation is a category A deficiency. However, if the infestation is limited to a very small area that is immediately cleaned, and the mites are not found on the cheese, this deficiency can be assigned to category C. The condition and correction shall be described in the report and a recommendation made to prevent recurrence of the problem and for closer attention to insect control procedures.

E. Dermestid insects (Carpet beetles, cabinet beetles, etc.).

Live dermestid insects (either larvae or adult stages) found infesting a dry milk plant or its warehouse where packaging supplies and finished products are stored shall be considered a category A deficiency. The INELIGIBLE status applies until resurvey shows elimination of insects, including all cast larvae skins.

When a survey reveals only dead insects or cast larvae skins in a processing or packaging room and a thorough inspection of the plant turns up no live insects, and management arranges for immediate cleaning of all insect evidence during the survey, this deficiency can be assigned to category B.

When a survey reveals live dermestid insect infestation in a very limited area which is remote from the processing and packaging operations, the finished product warehouse, and storage areas for packaging supplies, and management corrects the problem immediately during the survey, this deficiency can be assigned to category C.

In all cases mentioned, the report shall show the full details of the infestation, the management response, and a recommendation for closer attention to insect control procedures. Also, send specimens to the National Field Office in a small plastic or glass vial (plastic preferably–ask the plant to supply a universal vial normally used for the raw milk samples or purchase a vial from a drug store). Put a small amount of alcohol in the vial, if any is available, and attach a label showing the name and address of the plant, survey date, and your name.

F. Other insects.

When insects other than flies, roaches, mites or dermestids are noted during a survey, the inspector should make detailed checks to determine the extent of the problem. Consideration should be given to the type of insect, potential as a product contaminant, and area of plant where found. Call the National Field Office if you have any questions.

Item A38—Water Supplies & Handling (58.127a, b, 58.217).

Sanitary Water Supply

There shall be an ample supply of hot and cold water of safe and sanitary quality, protected against contamination, with adequate facilities for proper distribution throughout the plant.

Water from other facilities, such as evaporators, may be used for boiler feed water and condenser water provided that such water lines are completely separated from the potable water lines, the equipment is constructed and controlled to preclude contamination of product contact surfaces, and the system is officially approved (see the sections on cow water and process water). There shall be no cross connection between potable water lines and nonpotable lines or between public and private water supplies.

Bacteriological examinations shall be made of the plant's sanitary water supply on samples taken at the plant at least twice yearly or as often as necessary to determine safety and suitability for use in manufacturing dairy products. The results of water tests shall be kept on file at the plant for which the test was performed. Show on the report the date of the latest tests on the water supply. If the test is more than six months old, recommend retesting.

Plants on a municipal water supply may draw the sample, but must have the test done at a State or EPA approved laboratory.

Plants with their own well must have the sampling and testing done by the State Regulatory Agency, or a local health officer. The location, construction, and operation of the well shall comply with regulations of the appropriate agency.

When water lines are connected to a product line or tank, check that the water supply is a potable supply or State accepted process water (see the guidelines below for process water). Do not criticize iron, brass, or copper water lines with threaded fittings and valves for directing the water to the tanks. However, any portion of a water line which projects into a dairy ingredient tank, or connects directly to a milk line, shall be of sanitary stainless steel construction back to and including the shut-off device or check valve. In addition, the potable water supply shall be protected from contamination by milk or milk products.

Protection of the potable water supply is usually achieved by having two pipe diameters of open space between the potable water supply line and the overflow level of the storage tank or by the use of an approved backflow preventer. A block and bleed system does not provide adequate protection for the potable water supply.

“Cow Water”

Among other requirements, §58.217 of the General Specifications outlines the permitted and prohibited uses of condensed water vapors which are removed from milk or dairy products during the process of vacuum evaporation. Such hot water recovered after extraction from the milk is termed “cow water.” When a modern multiple effect evaporator is used, the moisture vapor withdrawn from the milk is usually piped to the tube chest of a subsequent effect or to product preheaters. These hot vapors are used to heat product and in this process of giving up heat are condensed into hot condensate, or cow water. Since the moisture vapors are drawn from the milk product at high velocity and with considerable surface turbulence, it is normal that this cow water contains some entrained product solids. The amount of entrainment can vary widely depending on the design of the evaporator and its vapor separators, kind of

dairy product, rate of evaporation, skill of the operator, start-up conditions, vacuum leaks, malfunctions, etc.

The entrained product solids can support subsequent bacterial growth under appropriate conditions of time and temperature. For this reason, cow water is considered nonpotable and it may not be intermixed with dairy products, for instance, by rinsing product and foam from tanks for an edible product, chasing milk from pipelines or evaporator, etc. It may not be used as final rinse water, acidified rinse water, or for makeup of sanitizer solutions for product contact surfaces after cleaning is completed.

Notes:

Cow water should not be confused with steam condensate from steam heaters or from first effect evaporator tube chests which are heated only by steam. If the first effect is heated by a combination of direct steam and recompressed milk vapors from a subsequent effect, the hot water from the first effect tube chest is a mixture of steam condensate and cow water and must therefore be handled as cow water.

Cow water is not tail water from an open type condenser. Such tail water contains only a small proportion of condensed vapors from the milk, and the temperature of the mixture is relatively low. Although it is frequently cooled and recycled as condenser water, it is seldom used for other purposes in the plant.

Permeate from reverse osmosis (RO) membranes, if reused within the plant, shall meet the requirements of this section except as noted below.

Permeate from ultra-filtration (UF) membranes contains milk constituents and cannot be used as a water supply without further processing.

Process water is cow water or RO permeate that has been treated so that it is safe to use in instances where cow water is not (addition to products, sanitizer makeup water, etc.).

Cow water can be utilized for prerinsing equipment or pipelines to the drain, for makeup of either alkaline or acidic cleaning solutions for washing equipment, for hose stations used for cleaning floors, exterior of trucks, exterior surfaces of equipment, etc. However, the following restrictions apply:

1. Pipelines, pumps, tanks, etc. for handling cow water must be completely separate from plant or city potable water systems with no cross-connections which would permit contamination of the potable supply. Where potable water to cow water interconnections are necessary, there shall be a break to atmosphere or use of an approved backflow preventer in accordance with applicable plumbing codes.

2. The amount of milk solids entrainment in cow water shall be monitored by turbidity or conductivity instruments mounted in the lines from the various collection points on the evaporator system. Sensitivity of these instruments can be adjusted and they can be

wired to operate divert valves to direct the cow water to the drain when the organic content is in excess of 12 mg/l (or standard turbidity in excess of 5 units).

Such continuous monitoring and automatic diversion of unsuitable water is not required when the cow water is reused for boiler feed water, in boilers not used to generate culinary steam, in a raw product, thick, double walled, enclosed heat exchanger, and in a RO permeate line.

3. The water, if not used immediately, may be stored using pipes and tanks constructed of stainless steel, iron, coated iron, fiberglass, or any other nontoxic material suitable for water handling (see item 4 for the temperature requirements of stored cow water). The tanks should have means of drainage, and means of access for required periodic cleaning. (Frequency of cleaning cannot be precisely specified–will depend on water quality, frequency of emptying, etc.).

   Insulation of the tanks may be desirable to retain water temperature if the tanks are located outdoors.

   Elevated locations are commonly used to provide gravity pressure for plant distribution.

   When there is a shortage of hot cow water for desired plant uses, potable water may be introduced into the cow water tank. This is a satisfactory practice if the potable water is introduced in such manner that there is no possibility of cross-contamination of the potable water supply.

4. The temperature of stored cow water shall be maintained at 145° F or higher by automatic means.

   Any necessary supplementary heating may be with steam injection, heating coils, etc. The amount of such heating required depends on tank insulation, and initial temperature of the cow water mixture. The hottest water (150-170° F) originates from the initial effects of the evaporator. Water from subsequent effects is at progressively lower temperatures. Cow water from the final effect or from a closed type condenser might be approximately 110-130° F. (The main determinants of original cow water temperature are the design of the evaporator and the temperature and amount of condenser water used.)

   In lieu of maintaining the water at 145° F or higher to prevent bacteria propagation as outlined above, bactericides such as chlorine may be used. If this alternate approach is employed, an automatic proportioner shall be provided to add the bactericide to the water before it enters a storage tank.

   There is no special 145° F heating or bactericide treatment requirements for cow water that does not enter a storage tank.

5. Cow water piping shall be free of dead ends. Water in such dead end piping would quickly cool down and permit excessive microbial growth. To prevent cooling of water in piping distribution systems, the lines may be insulated and/or make a complete circuit back to the supply tank for natural circulation.

   Cow water shall not be piped to plant distribution locations where there is danger of improper use, such as introduction into dairy products or final rinse of cleaned equipment.

   Cow water should be piped only to distribution and use points in the plant where there will be frequent, regular utilization. (Intermittent use might allow excessive bacteria development in the cooled-down water stored in the long “dead ends” formed by the distribution piping.)

6. The responsibilities for collecting and handling of cow water, cleaning of tanks, etc. should be clearly established by plant management. The procedures should be monitored by bacteriological testing as necessary to assure proper control.

7. Distribution lines and hose stations are to be clearly identified as Cow water systems and not suitable for use in product.

8. Cow water handling practices and guidelines are prominently displayed on employee bulletin boards, lunch room walls or locker room walls.

9. Cow water lines are not permanently connected to product vessels unless there in a break to atmosphere and sufficient automatic controls to prevent the inadvertent addition of cow water to product streams.

These restrictions on the use of cow water are due to its nonpotable classification. It is technically possible to purify and treat any water (including cow water or RO permeate) to make it safe. This, however, would require rigorous control and routine laboratory testing of the factors which determine water safety. (SPC, coliform, organic content, chemical quality, organoleptic quality, use of approved chemicals.) If management is interested in this approach, suggest contact with the National Field Director who can supply guidelines for the monitoring and testing involved. See the guidelines for Process Water below.

If cow water is used exclusively for boiler feed water in boilers not used to generate culinary steam, or in thick-wall type heat exchangers (tube in shell), it is not necessary to check on any of the previous points. In such instances, control of the cow water is primarily for engineering, not sanitary considerations. Cow water relatively free of entrainment is required to avoid serious boiler operation problems.

Reuse of cow water in the plant has a number of economic advantages:

1. Savings on amount of fresh water needed to operate the plant.

2. Sewer charge savings.

3. Energy savings from recovery of heat in the water for useful purposes.

4. Reduced amounts of boiler treatment compounds are needed when cow water is used for boiler makeup water. (Quite soft.)

5. Less cleaning compounds needed to make up cleaning solutions.

For these reasons, plant use of this water is expected to increase. If you have questions about proper procedures for collecting and handling it, consult with the National Field Director before making recommendations. Use this item to show recommendations when applicable.

Examples:

A38. — Maintain cow water tank temperature at 145° F or higher (cow water tank currently at 140° F) (D).

A38. — Provide a sensor device to monitor cow water collected from the first and second effects of the evaporator to automatically divert unsuitable water (now monitored only visually by the evaporator operator who manually diverts it at start-up or when cloudy) (C).

"Process Water"

Acceptable process water is water recovered from processes such as evaporation or membrane processing and subsequently handled and treated in such a manner that it can be considered a safe water supply. Acceptable process water, in addition to municipal water and potable private water systems, is suitable for intermixing with products for human consumption in certain specified applications. USDA-Dairy Programs will accept the use of process water in applications where it is intermixed with products for human consumption when the following requirements are met:

1. The process water collection and handling system shall meet all of the applicable requirements for cow water handling in this item.

2. The process water system shall be maintained completely separate and free of cross connections to municipal or private potable water systems.

3. The State Regulatory Agency shall determine the criteria to be used to determine the acceptability of the process water. The criteria shall be either the microbiological, chemical, radiological, and physical criteria as set forth in the National Drinking Water Regulations of the Environmental Protection Agency (40 CFR Parts 141-143), or Appendix D, Section V, of the Grade A Pasteurized Milk Ordinance, 1999 Revision.

4. The responsible State regulatory authority shall provide written acceptance of the process water. The State need not certify the water as "potable," only that it is safe for intermixing with food products for human consumption. The state acceptance letter shall state the

criteria to be used to accept the process water and shall identify the specific applications where the process water is acceptable to be used.

5. The plant shall follow any sampling and testing regimen the State Regulatory Agency deems necessary and maintain the State requirements and have all pertinent records on file and available for inspection.

If a plant is intermixing process water with products for human consumption, check to see that a letter of acceptance from the State Regulatory Agency is on file, and make a cursory check of the water test records to ensure that the plant is following the State prescribed testing regimen. If the letter of acceptance is not on file, or the plant is not following the prescribed testing program the INELIGIBLE status shall be assigned (category A deficiency).

If the letter of acceptance is on file but lacking either 1) the criteria of the prescribed testing program to be used to determine the suitability of the process water or 2) specific applications where the process water can be intermixed with products for human consumption, assign the deficiency to category B.

Nonpotable Heat Exchange Media

When applicable, report on nonpotable heat exchange media such as cow water, cooling tower water, sweet water, RO permeate, glycol, etc. used as heat exchange media in plate and other type heat exchangers, processing vats, cheese vats, cold-wall tanks, etc. It is not necessary to make special checks if the plant is only using a potable water supply for this purpose.

Since the potential exists for intermixing of the heat exchange media and product due to cracks or pinhole leaks, the following criteria shall apply.

A. Inspection of Systems Which Use Nonpotable Heat Exchange Media.

Visually inspect the heat exchange media systems. This may include sweet water, brine, glycol, cow water, or cooling tower water. All systems are to be structurally sound, free of leaks, and holding tanks shall be equipped with covers. The covers should be tight fitting, overlapping, and have a downward flange ⅜ inch long, or have a gasketed flange, to prevent the entrance of contaminants into the system.

Cow water systems are to be inspected utilizing the criteria set forth in this Item. Cow water systems complying with these criteria and used for single pass heat exchange purposes are acceptable.

Examples:

a. Cow water from the evaporator is collected in a storage tank according to the requirements of this Item. Cow water from this tank is used to preheat product in a plate heat exchanger with the cow water then going to drain. Other uses for cow

water such as hose stations, CIP pre-rinse, or CIP solution makeup may also be drawn from the storage tank.

b. Cow water from the evaporator is collected in a storage tank according to the requirements of this Item. From this storage tank, cow water is used to preheat product in a tubular heat exchanger, then piped directly to a plate heat exchanger used to preheat product, then goes to drain.

It is not acceptable if recirculation or bypass lines are included in the system to return cow water, which has been used to preheat product, back to the storage tank.

Atmospheric tower water systems are not acceptable for use as heat exchange media for direct cooling or heating of product across a single, thin walled heat exchanger surface such as a plate heat exchanger. Such recirculated tower water is acceptable for use in thick walled heat exchangers, such as a shell and tube heater or for nonproduct cooling or heating purposes such as for evaporator condensers of either the direct or indirect types.

Any water treatment chemicals (i.e., freezing point depressants, rust inhibitors, etc.) must be nontoxic and of food grade quality. For preparing glycol solutions, propylene glycol may be used, but not ethylene glycol. Check container labels of the water treatment additives. If they do not bear a declaration of food grade quality, ask plant management if they have a letter from the chemical supplier certifying that the additives are food grade quality. When no ingredient quality statement or label is available, make a recommendation that only safe, nontoxic food grade additives shall be used and that appropriate documentation shall be obtained and maintained on file.

B. Testing Requirements for Nonpotable Heat Exchange Media.

A minimum of two coliform tests per year shall be performed on each nonpotable heat exchange media system, including cow water systems, but excluding tower water systems, in the plant.

Coliform tests shall be routinely performed on samples taken by a Federal, State, or local regulatory authority with the tests conducted in the USDA or an official State laboratory. The results shall be on file at the plant. Show on the report whether the most recent results were satisfactory or unsatisfactory and the date of the test. If results are not on file, or if the report is dated more than six months old, recommend retesting.

Should a test report reveal that unsatisfactory levels of coliform organisms are present, the APPROVED 3-MONTHS status shall be assigned (category B deficiency). Inform them that the rating is being assigned due to cooling media quality. Recommend that the system(s) be inspected for defects, cleaned, and sanitized within the 3-month period so that subsequent test results will be satisfactory. Failure to eliminate the unsatisfactory coliform count will result in the INELIGIBLE status (category A deficiency).

C. Acceptable Results for Coliform Bacteria Tests.

Cooling media samples are to be tested for coliform bacteria in accordance with the test procedures identified in the most recent edition of *Standard Methods for the Examination of Dairy Products*. Testing is to be by either the Most Probable Number (MPN) method or the Membrane Filter method.

Test results will be considered as satisfactory if they meet the following criteria:

1. Most Probable Number (MPN) - less than 2.2/100 ml. (often reported as <2.2).

2. Membrane Filter Method - less than 1/100 ml. (often reported as <1).

Item A39—Alternate Fats.

All USDA Approved plants, listed in Section I of the Approved Plant Book, that manufacture or package margarine, butter/margarine blends, imitation cheese products, filled evaporated milk, or other products which utilize fats other than butterfat shall have their dairy products sampled and tested for alternative fats by USDA.

During each survey (except for a timely follow-up survey after the assignment of the INELIGIBLE, NO STATUS ASSIGNED, OR PROBATIONARY 10-DAYS status) select one sample that is a minimum of ¼-pounds, or one can of evaporated milk, from current production or product that is in the cooler. The properly prepared sample shall be sent to the Science Division Laboratory for testing.

On the survey, leave this item blank, the results will be filled in by the National Field Office as appropriate.

Prepare a DMS report listing the applicant, product, churn, vat or sublot number. In the remarks section, write "TEST FOR ALTERNATE FAT." The applicant shall be charged for the time spent selecting, preparing, and testing the samples. Include the charges in the total fee, expense, and laboratory charges for the survey.

Seal the original and 1 copy of the DMS along with the sample(s) in a polyliner using a grip-lock seal, then seal the polyliner in a shipping carton using evidence tape. The plant is responsible for mailing or shipping the samples to the lab. Leave one copy of the DMS with the plant. Send a copy of the DMS along with the plant survey report to the National Field Office.

Item A40—Plant Exterior & Premises (58.125, 58.126a, 58.127f, 58.146d).

A. Plant Surroundings (58.125, 58.126a, 58.146d).

Check the immediate surroundings for unsatisfactory conditions such as: the presence of rubbish; high weeds or grass; surplus equipment near the plant and adjacent areas; freedom from strong or foul odors; excessive air pollution or smoke; etc. In the broadest sense, the term "immediate surroundings" might be defined as extending to the boundaries of the site under control of management. However, some judgment must be exercised. The primary emphasis should be the checking of areas close to the plant entrance and other openings for good housekeeping.

There may be instances, however, where unsatisfactory conditions are noted in the immediate surroundings that are not under the direct control of management.

Example:

Bad odors or dusty conditions emanating from an adjacent farm or factory.

Besides aesthetic considerations, such adjacent areas might be sources of air contamination causing a bacterial problem in the plant or product. For instance, such environmental conditions may be a factor in salmonella control at dry milk products plants. Adjacent areas housing poultry, pigs, pigeons, etc., are unsatisfactory and recommendations should be made for eliminating potential sources of contamination from the proximity of the plant. The recommendation may be helpful to management in obtaining correction.

Check the plant facilities for sound construction and good maintenance. Make recommendation for any needed repairs or painting. When very extensive repairs are needed, the recommendation may be for needed repairs or replacement with a new structure suitable for dairy processing. Do not cover plant interior deficiencies under this item, handle them in the report section dealing with the particular room or area.

Inspect all outside wall openings to determine if they are properly protected to prevent entrance of rodents, birds, insects, etc. Self-closing flaps should be checked for proper operation. When deficiencies are noted make recommendations for corrections.

Plant driveways and adjacent plant traffic areas should be hard surfaced with concrete, asphalt, or similar material to keep dust and mud adjacent to production or intake areas to a minimum.

The grounds around the plant should be properly graded or otherwise provided with a satisfactory drainage system to drain surface water rapidly away from the plant. Such water "shall be disposed of in such manner as to prevent an environmental or health hazard." Do not criticize properly engineered holding ponds.

Usually the surface water (primarily rain) presents no particular disposal problem on a properly engineered site. It is disposed of by seepage, runoff and storm sewers. Disposal of drainage that may contain milk or other product spillage (as from an uncovered truck loading or unloading area) is another matter. These drains shall be connected to a sanitary sewer.

B. Solid Waste Storage & Disposal (58.127f).

Containers for collection and holding of plant wastes shall be made of metal, plastic, or other impervious material. They shall have tight fitting lids and be kept covered while temporarily stored outside the plant prior to pick up. This does not preclude the orderly storage of cardboard bales outside the plant, provided they are picked up regularly. Also check that solid wastes are disposed of regularly and that containers used inside the plant are maintained in acceptable condition and cleaned before reuse.

Exhibits

Exhibit A1

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

MILK QUALITY - DMCC SLIDES

NAME AND ADDRESS OF PLANT SURVEYED
DUXBURY CREAMERY
DUXBURY, MN

TYPE OF PLANT (Product Manufactured)
MILK RECEIVING

SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1			
2			
3			
4			
5			

REMARKS:
NO SAMPLE. PLANT IS ON REDUCED TESTING

NAME AND ADDRESS OF INSPECTOR
SAM PLING HOLSTEIN, IA

SIGNATURE OF INSPECTOR
Samatha Pling

DATE OF INSPECTION
10/27/97

NAME AND ADDRESS OF LABORATORY

SIGNATURE OF LABORATORY TECHNOLOGIST

DATE

FORM DA-144 (MAY 86) *Edition of 4/78 may be used*

Exhibit A2

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

MILK QUALITY - DMCC SLIDES

NAME AND ADDRESS OF PLANT SURVEYED
RIB LAKE CHEESE CO.
RIB LAKE WI

TYPE OF PLANT (*Product Manufactured*)
CHEESE

SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	RT 2 GRADE A HOLDOVER	38°	
2	RT 3 GRADE A HOLDOVER	38°	
3	RT 5 GRADE B FRESH, FROM DUXBURY CREAMERY	44°	
4			
5			

REMARKS:

NAME AND ADDRESS OF INSPECTOR
DREW A. SAMPLE, MAXVILLE, WI

SIGNATURE OF INSPECTOR
Drew Sample

DATE OF INSPECTION
10/27/97

NAME AND ADDRESS OF LABORATORY

SIGNATURE OF LABORATORY TECHNOLOGIST

DATE

FORM DA-144 *Edition of 4/78 may be used*
(MAY 86)

Exhibit A3

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

MILK QUALITY - DMCC SLIDES

NAME AND ADDRESS OF PLANT SURVEYED
NICE BUTTER CO.
NICE, CA

TYPE OF PLANT *(Product Manufactured)*
BUTTER, POWDER

SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	SILO 1 IN AND OUT SYSTEM 9:30	38°	
2	11:00	40°	
3	1:30	40°	
4			
5			

REMARKS.

NAME AND ADDRESS OF INSPECTOR
R. U. DRIPPING LIKELY, CA

SIGNATURE OF INSPECTOR
Ralph Dripping

DATE OF INSPECTION
10/27/97

NAME AND ADDRESS OF LABORATORY

SIGNATURE OF LABORATORY TECHNOLOGIST

DATE

FORM DA-144 *Edition of 4/78 may be used*
(MAY 86)

Exhibit A4

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

MILK QUALITY - DMCC SLIDES

NAME AND ADDRESS OF PLANT SURVEYED
RED & WHITE MILK HAULERS
MOOVILLE, NY
TYPE OF PLANT *(Product Manufactured)*
MILK RECEIVING

SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	TANKER 007 GRADE A 50,000 lbs	44°	
2	SAME AS 1		
3	SAME AS 1		
4			
5			

REMARKS

NAME AND ADDRESS OF INSPECTOR
E.Z. DOESIT BREAKABEEN, NY
SIGNATURE OF INSPECTOR
Earl Doesit
DATE OF INSPECTION
10/27/97

NAME AND ADDRESS OF LABORATORY
SIGNATURE OF LABORATORY TECHNOLOGIST
DATE

FORM DA-144 *Edition of 4/78 may be used*
(MAY 86)

Page B. Inspection of Butter Operations. (Form DA - 151 - 2)

Cream Processing

Item B1–Room Construction (58.126, 58.146d).

See the guidelines for Item A1–Room Construction.

Item B2–Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2–Lighting & Ventilation.

Item B3–Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3–Pumps, Pipelines, & Valves.

Recommendations about cleaning deficiencies should be brief but include sufficient detail to identify the location of the pump, the valve, etc., in the department.

Item B4–Separator (58.128e).

A. Enclosed type separators.

Check the bowl, discs, disc cover and all miscellaneous parts of the separator for condition and cleanliness. Also, dismantle and check the inlet and outlet fittings, including those underneath the machine on bottom feed models. Stainless steel or carbon steel bowls and other product contact parts are unsatisfactory when pitted or not properly tinned. In such cases, recommend replacing the bowl and other parts with stainless steel, or retinning.

B. Clean-in-place enclosed type separators.

New separators shall meet the *3-A Sanitary Standards for Centrifugal Separators and Clarifiers, Number 21-*. This standard became effective November 24, 2002. Separators built before this date are “grandfathered” and are free to move from plant to plant.

Many older separators have riveted skim and cream pumps. The standard does not allow for this type of construction. As this type of pump wears out a crevice will develop between the top

and bottom halves. When this is noted recommend replacement with a pump that meets the current 3-A Sanitary Standard and assign the deficiency to category D, provided the pumps are clean and otherwise in good repair.

When the separator is a “CIP” type, the CIP cleaning regimen shall be operated by an automatic cleaning programmer following the recommendations of the separator manufacturer. It should be standard plant practice to disassemble CIP separators for routine inspection at regular intervals recommended by the manufacturer. Ask if this is being done and check plant record keeping in this regard. When the plant does not have a routine inspection program for CIP separators, recommend that one be implemented.

Inspecting CIP type separators at each survey is not necessary if the previous survey has shown satisfactory cleaning performance. Be sure to show on the report when CIP separators are inspected and what was observed. Also show which separator was inspected if the plant has several units. This information will be helpful to the inspector handling the subsequent survey in deciding whether or not to have a unit dismantled.

When these separators are dismantled for inspection, check for pitting or scoring of the skim and cream pumps. Also check for proper cleaning of the parts above the bowl and especially the bottom disks of the stack. When cleaning is found unsatisfactory, recommend that the plant open and inspect the unit frequently until they establish a satisfactory cleaning regimen. If the cleaning problem cannot be remedied promptly, management should obtain assistance from the separator manufacturer. During the next USDA survey dismantle and inspect the separator to verify that effective cleaning is being accomplished.

Most modern high efficiency, automatic self cleaning clarifiers and separators are not designed or constructed to permit the collection and recycling of the sludge (“shoot”) for human food. The areas of the machines that contact the sludge during the desludging operation are not designed or constructed as sanitary product contact surfaces. Some cream separators and centrifugal fine savers are designed to reclaim the heavy phase for use in human food.

When self cleaning clarifiers or separators are encountered during routine plant inspections or cursory inspections, determine how the plant is handling the “shoot” material. If the material is being collected and recycled back into the human food process from unsanitary surfaces, recommend that the practice be discontinued immediately and that the material be handled as waste or animal feed. Failure of the plant to discontinue the practice will result in the INELIGIBLE status assignment for all products into which the recycled sludge is introduced.

Item B5–HTST Sealed _____ at _____ sec. _____° F (58.128, 58.334).

Use Item B6–HTST or Vat Pasteurizer to record any deficiencies noted concerning sanitation or fabrication.

The terms "pasteurization", "pasteurized" and similar terms shall mean the process of heating every particle of milk or milk product, in properly designed and operated equipment, to one of

the temperatures given in the following chart and held continuously at or above that temperature for at least the corresponding specified time:

Temperature	Time
145° F *	30 minutes
161° F *	15 seconds
191° F	1.0 second
194° F	0.5 seconds
201° F	0.1 seconds
204° F	0.05 seconds
212° F	0.01 seconds

* If the fat content of the milk product is 10% or greater, or a total solids of 18% or greater, or if it contains added sweeteners the specified temperature shall be increased by 5° F.

The minimum pasteurization for HTST systems is 161° F for not less than 15 seconds for fluid milk and 166° F for not less than 15 seconds for cream. Any time-temperature relationship below these minimums shall be considered a category A deficiency.

Destruction of pathogenic bacteria (pasteurization) in cream can be achieved by heating to the minimum time/temperature required for cream, however, cream for butter making must be pasteurized at a minimum of 185° F for not less than 15 seconds (for the HTST method, when the vat method is used, cream for butter making shall be pasteurized at a temperature of not less than 165° F and held continuously for not less than 30 minutes) as specified in the General Specifications and the U.S. Standards for Grades of Butter. The additional heat treatment is intended to further reduce the bacterial population and enhance butter keeping quality. Longer times or higher temperatures can be used, but any time-temperature relationship above the minimum for cream but below the requirements for cream for butter making shall be a category B deficiency. If unsatisfactory, recommend correction and show what is wrong.

All HTST units shall be timed and sealed by an authorized agency. Review the certifying agency report and show the sealed hold time in forward flow and the “cut-out” divert temperature on the survey report for this item. Do not routinely report diverted flow hold time or “cut-in” temperature.

The HTST system should be timed and sealed semiannually to assure continued compliance with the *3-A Accepted Practices for Sanitary Construction, Installation, Testing, and Operation of High-Temperature Short-Time and Higher-Heat Shorter-Time Pasteurizer Systems, Number 603-*. When the HTST inspection report is dated more than six months previous, show a recommendation to have the official agency reinspect, time, and reseal the unit. Plant management shall also arrange such reinspection whenever there is alteration or replacement of HTST components that may affect the required temperature or hold time.

When reviewing an HTST system during a plant survey, several situations may arise which can have an impact on pasteurization and status of the plant. Listed below are several example situations and the appropriate follow-up.

A. Report is Dated More Than 6 Months Old, All Seals are Present and Intact.

Discuss the situation with plant management and show a recommendation on the survey report to have the official agency conduct the necessary equipment checks, time, and reseal the HTST unit. If the date of the last report is more than six months but less than one year old assign the deficiency to category E. If the report is dated more than one year old assign the deficiency to category D.

Since coordination and scheduling of the authorized regulatory authority is outside the control of the plant, the first occurrence of this situation would not by itself adversely affect plant status. However, since our plant survey program deals directly with the dairy plant and not the State Regulatory Authority, repeated occurrences will reflect adversely on plant status. If this situation persists, the National Field Director may reduce plant status to encourage compliance with the Dairy Grading Branch requirement.

B. A Regulatory Seal on The HTST System is Broken.

During the day-to-day operation of a dairy plant, situations may occur (such as a pump breakdown or a recorder failure) which require the breaking of a regulatory seal to continue operation. When a broken regulatory seal is noted during a plant survey, it shall be considered a serious deficiency because the safeguards that assure pasteurization may have been altered and complete pasteurization can no longer be assumed. If this situation occurs, the INELIGIBLE status applies unless the dairy plant management has taken the following steps.

Plant follow-up when a seal is broken.

1. Dairy plant management shall have immediately contacted the State Regulatory Authority (at the time the seal was broken, not the day of the survey) and requested the HTST system be reinspected, timed and resealed as soon as possible.

2. Following the above contact with the State (at the time the seal was broken, not the day of the survey), the dairy plant management shall telephone or fax the National Field Office to inform them that a regulatory seal has been broken and that the State Regulatory Authority has been contacted. They should also indicate the date scheduled for the HTST system component repair or replacement and, if known, the date scheduled for HTST system review.

When the HTST system has been inspected, timed, and resealed, plant management shall telephone or fax the National Field Office and inform them of HTST compliance. This discussion is to be confirmed with a follow-up letter or fax and a copy of the sealing report.

When they satisfy these parameters, the broken or missing seal may not by itself adversely affect plant status. However, if the authorized regulatory authority is unresponsive to the plant request and reinspection is not done in a timely manner, the National Field Director may assign the INELIGIBLE status.

C. Circumvention of HTST System Controls or Components.

When circumvention or failure of HTST system controls or components is noted (such as mixing raw and pasteurized milk, improper operation or bypass of the flow diversion device, removal or obstruction of a vacuum breaker, etc.) which effect the safety factors designed into the system or which circumvent the time-temperature relationship, the INELIGIBLE status shall apply (category A deficiency).

Item B6–HTST or Vat Pasteurizer (58.128, 58.334).

Cross out the nonapplicable part of this heading on the report to show the kind of equipment being inspected.

Examples:

B6. ~~HTST or~~ Vat Pasteurizer
or
B6. HTST ~~or Vat~~ Pasteurizer

Also, make recommendations under this item concerning any sanitation or condition deficiencies noted during inspection of the HTST or vat pasteurizer.

High Temperature Short Time Pasteurization (HTST).

The applicable 3-A document for HTST pasteurizers is *3-A Accepted Practices for Sanitary Construction, Installation, Testing, and Operation of High-Temperature Short-Time and Higher-Heat Shorter-Time Pasteurizer Systems, Number 603- .*

When an initial survey reveals an unsealed HTST installation that obviously does not comply with the 3-A Accepted Practice, recommend the NO STATUS ASSIGNED status (category A deficiency). Also, recommend timing and sealing by an authorized agency and in parentheses after the recommendation, show what parts of the system are missing or do not comply.

It is the responsibility of the regulatory agency to check for proper “3-A” engineering of the HTST system. In view of this, it is not necessary for the USDA inspector to conduct a detailed design evaluation to check for 3-A compliance. However, make a cursory check for deficiencies that might have developed since the official sealing date, such as an improper slope on the hold tube, divert line not free-draining, missing shut-off or vacuum breaker valves, wrong timing pump in use, etc. If such deficiencies are noted on officially sealed units, make appropriate recommendations and show supporting information on the report. The National

Field Director will consider the possible effect on plant status and when necessary follow-up with management or the responsible regulatory agency about the discrepancies.

When the plant has excess cream intended for shipping and uses the HTST unit for pasteurization at a temperature lower than required for cream for butter making, they can install separate recorder-controllers, each set and sealed to divert at the proper temperature; install a dual controller-recorder; or the plant can add a dual diversion point control to their present unit as provided by the 3-A Accepted Practice.

A dual diversion point control will allow the plant to pasteurize two products with the same HTST unit by use of a manual operating switch using two different divert temperatures. In this case, the control switch is set at the higher divert temperature for the cream for butter and manually changed to the lower divert setting when processing shipping cream. The HTST operator should notate each chart to show clearly what product was run to correspond with the divert point shown by the pen arm. This information, when coupled with the operators notation about the kind and amount of cream being pasteurized gives additional assurance that the proper divert setting was used (for instance, “Cream for butter making, 185° F divert, 50,000 lbs, 4-10 PM, 11/04/00, LTR”). Shipping or production records should be periodically checked to ensure that cream for butter making was pasteurized at the proper temperature.

A raw product constant level tank is required as “Component Equipment” when product-to-product heat regeneration is used. HTST systems that do not have regenerators are also often supplied with a constant level tank although it is optional. The fabrication criteria are the *3-A Sanitary Standards for Uninsulated Tanks for Milk and Milk Products, Number 32- .* However, do not expect the 3-A symbol to be on tanks in older existing HTST systems (the 3-A Sanitary Standards for Uninsulated tanks became effective February 2, 1975).

Here are a few special points to keep in mind concerning review of HTST constant level tanks:

1. Provision for use as a constant level tank is made in the Scope of 3-A Sanitary Standards for Uninsulated Tanks.

2. Removable covers for open top type tanks shall have downward flanges not less than ⅜-inch long.

3. The edges of all openings in the top of the tank shall extend upward at least ⅜ inch.

4. The tank bottom must be pitched at least ¼ inch per foot toward the outlet.

The 3-A Accepted Practice for HTST Systems also includes some requirements about raw product constant level tanks. These requirements are all consistent with those in 3-A Sanitary Standards for Uninsulated Tanks, however, several points merit further mention:

1. The Accepted Practice requires “an automatic device of sanitary construction to control the raw product level.” This may be a probe type controller, a float controlled valve, a

diaphragm type sensor, etc. Some constant level tanks are equipped to provide two different levels, one for raw product and one for cleaning solutions.

2. The accepted practice requires that "The tank shall be fitted with a removable cover . . ." This should not be construed to mean that only open top type tanks are permitted because 3-A Sanitary Standards for Uninsulated Tanks clearly provides for both open top and closed type tanks. The closed type tanks, with a side manhole, are frequently used on pasteurizer systems for evaporators and are sometimes put inside the support pedestal for a tube chest or vapor separator.

3. When regeneration is employed the maximum overflow level of the constant level tank shall be lower than the bottom of the regenerator.

4. Connections for the divert line, the leak detect line, and the recycle line (if used) must be fabricated to prevent the back flow of raw milk into the pasteurized pipelines. This is usually accomplished with an air gap of at least two times the diameter of the largest pipe between these inlets and the maximum flood level of the tank

Follow the guidelines for Item A3–Pumps, Pipelines, & Valves when inspecting the piping, holding tube, timing pump, and valves associated with the pasteurizer. Dismantle the timing pump to check sanitation and condition of the seals and impeller. Open and inspect the heat exchange surfaces, try to arrange for inspection of the final heater during each survey because the temperature differential between product and heating medium is usually greater and can cause more burn-on and cleaning problems (refer to Item A27–Product Cooler for guidelines on inspection of heat exchangers). When unsatisfactory sanitation is found and the plant is using a clean-in-place procedure, recommend that the unit be opened daily for inspection and further hand cleaning until they have established an adequate CIP cleaning procedure. Inspect the interior of the constant level tank, float or level sensor, and underside of the lids (if used).

The old style single-stem Taylor flow diversion valve shall be completely dismantled daily for hand cleaning. Most new flow diversion valves are designed for effective cleaning in-place by a special cleaning cycle programmer that is an integral part of the flow diversion valve system. A sanitation check should, however, be made occasionally to establish a satisfactory history of cleaning performance.

The holding tube shall have an upward slope of not less than ¼-inch per foot. Reducers or expanders on the hold tube must be installed to maintain the flow of all product in an upward direction. If the hold tube has removable fittings, remove at least one and inspect the tube. If it is welded in place, remove a fitting at the inlet or outlet and inspect that portion of the tube. If the hold tube is to be cleaned in place, it shall have welded joints or properly designed CIP fittings and gaskets (threaded fittings with bevel seats require daily dismantling and hand cleaning and should be inspected each survey to check sanitation).

When a vacuumizer is used in the system directly following pasteurization, a vacuum breaker and automatic shut-off valve are required in the line to the vacuumizer to prevent negative pressure on the flow diversion valve during diverted flow. When the flow diversion valve is the

double-valve type, the vacuum breaker is not required if the leak detector port is open to atmosphere. However, when this port is piped back to the constant level tank, the separate vacuum breaker is required between the flow diversion valve and the automatic shut-off valve. Most installations have the leak detector port piped back to the tank to avoid losing product to the floor during startup.

If the product flow from the vacuumizer goes to an HTST regenerative section, another automatic shut-off valve and vacuum breaker are necessary, in that order, in the product line downstream from the vacuumizer. The purpose is to prevent interference with the required pressure relationships in the regenerative section of the HTST unit. If product from the vacuumizer is cooled by means other than a regenerator, the shut-off and vacuum breaker valves are not required after the vacuumizer.

These requirements for automatic shut-off valves and vacuum breakers are outlined in §58.128p and in the 3-A Accepted Practices for HTST Systems. Deficiencies noted concerning the vacuumizer should be listed under Item B7–Vacuumizer.

If the HTST equipment is in operation during the survey, check that the recorder pen arm is adjusted to correspond with the indicating thermometer. Also, check to see that proper charts are being used. Review the company file of recording charts. Also review the charts made during the cleanup of the unit to assure that proper CIP cleaning procedures are followed daily.

The charts should be routinely marked to show:

1. date,

2. plant identification,

3. notation of the indicating thermometer at a particular referenced reading point on the recording chart early in the production cycle,

4. name and amount of product being pasteurized,

5. product temperature at cut-in and cut-out, noted at the beginning of the production cycle,

6. record of the period in which flow diversion valve is in forward flow position (a periphery pen arm record),

7. the signature or initials of the operator.

If the pasteurizer has a positive pump serving as the timing pump, inspect it per guidelines for Item A3–Pumps, Pipelines, & Valves. A positive displacement type pump, or an equally effective timing device, must control product flow through a conventional HTST pasteurizer (see the 3-A Accepted Practices for HTST Pasteurizers). Several alternate timing devices have been approved.

A. "Metro–Flo" unit manufactured by Mojonnier Bros. Company.

This device came on the market about 1965. The principal of operation is to provide a fixed "head" or fluid level over an adjustable orifice, which allows gravity flow to a subsequent centrifugal pump. The fixed head is accomplished with two Pyrex bowls mounted one atop the other and each equipped with sensitive level controls. The adjustable orifice is set and sealed by the official agency to yield the required pasteurizer hold time. The Metro–Flo unit must also have an integral "flow stop" override mechanism that assures adequate fluid hold time during all possible conditions, including erratic inflow at start-up and shutdown.

The Metro–Flo unit is mechanically cleaned. Dismantling them for inspection is not necessary as the interior product contact surfaces can be seen clearly through the Pyrex glass.

In the dairy industry, most Metro–Flo units are installed in pasteurizer installations at evaporators. They are not restricted to this application. However, the system has not been proven and accepted for use with products more viscous than milk.

B. Magnetic Flow Meter Controller (Mag Flow).

These systems use a magnetic flow meter in place of the timing pump. The flow meter controls either a flow control valve or a variable speed centrifugal pump. To ensure constant flow through the meter it is usually installed in a vertical position, with the direction of flow from the bottom to the top. In addition, at least ten pipe diameters of straight pipe both upstream and downstream of the meter are required (i.e., 25 inches for a 2½-inch pipeline).

Inspect the product contact surfaces of the magnetic flow meter, flow control valve (if used), and the centrifugal pump per Item A3–Pumps, Pipelines, & Valves.

Higher Heat Shorter Time Pasteurization (HHST).

HHST pasteurizing systems are satisfactory if the system is properly installed and is approved by an official agency.

Briefly, HHST pasteurization requires much higher minimum temperatures for much shorter hold times to achieve pasteurization as follows:

Temperature	Time
191º F	1.0 second
194º F	0.5 seconds
201º F	0.1 seconds
204º F	0.05 seconds
212º F	0.01 seconds

These combinations of time and temperature are applicable for all fluid dairy products, including milk, cream, whey and condensed skim milk. However, when the HHST method is used to pasteurize cream for butter making the temperature and holding time must be at least equivalent to the HTST method (185° F for 15 seconds). For instance, at 191° F, the required hold time for cream for butter making would be 4 seconds rather than 1 second. Similar time-temperature relationships can be obtained from the National Field Director who will have the information plotted on a graph to show the required equivalent treatment.

The official agency does not verify the very short hold time involved with HHST pasteurization through salt injection and electronic timing methods as used in checking HTST systems. Instead, the hold time is determined by a "calculated method" which involves computations based on the product flow rate and the volume of product contained by the hold tube pipes and elbows, with the presumption that flow is laminar type.

Product heating for HHST pasteurization can be accomplished with conventional heat exchangers but where cooked flavor is a concern, rapid heating is important and is achieved by injection of culinary steam.

Ultra-pasteurization.

Ultra-pasteurization (e.g., the DASI System) refers to thermal processing at or above 280° F for at least 2 seconds either before or after packaging. In actual practice, ultra-pasteurization is usually a continuous heating process immediately followed by rapid cooling before packaging. Products so treated have extended shelf life under refrigerated conditions.

Most ultra-pasteurization equipment uses conventional regenerative heat exchangers for preheating. Final stage heating may be accomplished by direct steam injection while the product is under considerable pressure, by swept-surface heat exchangers, or other special heating equipment designed for such service. Rapid initial cooling is achieved by subjecting the product to vacuum conditions. Conventional regenerative and final stage cooling follows this.

To protect against recontamination during and after the heat treatment, vital fittings, valves, and shaft seals are usually fitted with sterilizing chambers subjected to flowing steam during operations.

To consistently make products with extended shelf life under refrigerated conditions, ultra-pasteurization systems are provided with a number of "fail-safe" controls that provide either proper operating conditions, or automatic shutdown of the process. These special system controls assure proper pasteurization of resulting products. The intent of the process is to far exceed pasteurization requirements, and continuously monitoring bacteriological and keeping quality tests of finished products assures extended shelf life.

To our knowledge, ultra-pasteurization is not employed for cream for butter making purposes, but it is used for fluid milk and cream in consumer size retail packaging.

Vat Pasteurizer.

The applicable document for vat pasteurizers is *3-A Sanitary Standards for Non-Coil Type Batch Pasteurizers for Milk and Milk Products, Number 24- .* A coil vat pasteurizer is also acceptable.

Vat pasteurization for excess cream intended for shipping shall be at 150° F for 30 minutes, however, cream for butter making shall be pasteurized at a minimum of 165° F for 30 minutes or equivalent as specified in the General Specifications and the *U.S. Standards for Grades of Butter*. The additional heat treatment is intended to reduce the bacterial population further and enhance butter keeping quality.

For control of pasteurization by the vat method, the vat(s) shall be equipped with an indicating, a recording, and an air space thermometer. All three shall be in good working order.

The recorder charts should routinely be marked to show:

1. date,

2. plant identification,

3. notation of the indicating thermometer at a particular referenced reading point on the recording chart early in the production cycle,

4. name and amount of product being pasteurized,

5. the signature or initials of the operator.

Product shall not be added to the vat after the beginning of the hold period nor removed before the hold period is completed.

Each pasteurizing vat which is operated at the minimum pasteurizing temperature of 165° F shall be equipped with an air space heater and air space indicating thermometer. If pasteurization is at 5° F or more above the minimum temperature (170° F in the case of cream for butter making, 155° F in the case of cream not intended for butter making), the air space heater may not be required, but the air space indicating thermometer is necessary to insure a temperature of at least 5° F above that required for pasteurization of the product. Culinary steam should be provided for the air space heater (see the guidelines for Item A36–Culinary Steam).

Vat covers shall be closed once the vat has been filled and remain closed during the holding period to assure proper pasteurization of the air space. Covers shall also be kept closed during the cooling period.

Check all interior surfaces for cleanup and condition. Dismantle the steam injector and remove the inlet and outlet to check sanitation. Also check that the outlet valve is a leak detect type

as required by the 3-A Sanitary Standards. If the agitator has a collar that is in the product zone, have a plant employee remove the agitator and inspect the area around the collar and the bottom bushing. Make appropriate recommendations.

Coil Vat Pasteurizer.

For time-temperature requirements for coil vat pasteurizers, see the Vat Pasteurizer section above.

Inspect sanitary seals to determine if they are being removed and cleaned daily. When old style packing glands are used on coil vats make a recommendation for replacement with a sanitary type seal. This shall be considered a category B deficiency.

Also, inspect the vat liner, coil, centerboard, covers, outlet valve, fittings, and exterior surfaces of the vat for cleanliness and condition. Pitted or tin-bare coils are not acceptable. Make appropriate recommendations as necessary.

Item B7–Vacuumizer (58.128p).

A vacuumizer is often used with continuous pasteurization equipment to help remove undesirable volatile odors from milk or cream. Open the unit and check sanitation, especially of the inlet, baffles (if provided) and portions of the vapor outlet line that can drain back to the vacuumizer (beyond that point sanitary construction is not required). Also inspect the pump that removes the product from the vacuum chamber.

Some plants may utilize the vapors drawn off a vacuum chamber to preheat the raw milk in a plate heat exchanger. If a plate heat exchanger is located in the vacuum line (usually the large pipe that exits at the top of the vacuum chamber) between the vacuum chamber and the vacuum pump(s), it is usually a preheater for the incoming raw milk.

Because the pressure is higher on the raw product side than it is on the vapor side in this heat exchanger, any leakage will be from the raw side to the vapor side. In the event the vacuum pump(s) stops, flow in the system will be toward the pasteurized product in the vacuum chamber, drawing any raw product on the vapor side with it. This constitutes a potential cross connection between the raw product and the pasteurized product. A thick walled heat exchanger (i.e., shell and tube) can safely be used in this situation

If, during a plant survey, a plate heat exchanger is noted in this application recommend eliminating the potential cross connection and assign the deficiency to category C. Note that if the vacuum chamber is located on the raw side the use of a plate heat exchanger is acceptable. A plate heat exchanger is also acceptable if the plant is only producing properly labeled raw milk or heat treated milk cheese.

Some pasteurizing systems, particularly HHST types, inject culinary steam to heat the product and this causes product dilution with water from condensed steam. The 3-A Accepted Practices for HTST Systems addresses prevention of product dilution by requiring a ratio

controller on the vacuumizer unit, which must be sealed. This controller will assure that the vacuumizer removes sufficient water (as boiled-off vapors) to equal the amount previously added during the heating process. §58.128p has a similar requirement for a ratio controller when applicable to the finished product. In summary, the ratio controller requirement primarily concerns Grade A milk where addition of water during processing is considered adulteration. These controls are not necessary for the processing of milk or cream intended for manufactured dairy products that have specific composition requirements.

These ratio controllers will probably be encountered only in Grade A operations that also want USDA inspection. Checking for their proper engineering and operation will not be necessary as this is the responsibility of the applicable Grade A regulatory agency.

Item B8–Cream Cooler (58.128i, j, k).

See the guidelines for Item A27–Product Cooler.

When the cream is pasteurized, cooled, and stored in the same vat, mark this item NA and show, “Same as B6” on the line following the words Cream Cooler.

Also show “Same as B6” when cream is pasteurized in an HTST system and cooling of the cream is accomplished in a separate section of the pasteurizer heat exchanger unit. Any deficiencies in the regenerative cooling or final cooling section of a combined HTST unit should be reported under Item B6–HTST or Vat Pasteurizer. If a separate cooler unit is used, deficiencies should be reported under this item.

Item B9–Butter Remelt Equipment (58.128a,).

This item covers the containers, tanks, and equipment used to handle and melt butter for addition back to the cream for butter making prior to pasteurization. There is no objection to this practice if the butter is clean and it is properly collected, handled, and melted in a sanitary way. Use Item B47–Handling of Rework & Scrap to record deficiencies in the collection, handling, and storing of rework butter and for the handling, storage, and disposition of waste butter.

Inspect the equipment used for melting. Depending on the volume of butter involved, the melting might be done in a small jacketed vat or perhaps a perforated stainless steel tray suspended in recirculated warm cream in an HTST constant level tank. In any case, look for rough welds, open seams, woven wire screens, etc., all of which are unacceptable. Recommend repairs or replacement. If steam is used to melt the butter, it shall be culinary steam (see the guidelines for Item A36–Culinary Steam).

If wrapping material is present in the butter, check that the wrappers are clean, free of contaminates, and are removed promptly when melting is completed. Make recommendations about any condition or sanitation deficiencies with the equipment or if poor practices are noted with the butter handling and melting operations.

If packaging materials are wax coated, the melting shall be conducted at a temperature below the melting point of the wax. Such coatings are normally made up from various wax polymer ingredients that have melting points over a wide spread, however, the wax conglomerate will usually change from a solid to a liquid state in the 160-170° F temperature range. Therefore, the butter melting temperature shall be kept below 160° F unless the plant provides documentation verifying a higher wax melting temperature. Also, a thermometer should be present to check the temperature.

Item B10–Storage Tanks (58.128d, 58.321).

See the guidelines for Items A28–Storage Tanks - Silo & A29–Storage Tanks - Horizontal.

There is no specific temperature requirement for storage of cream for butter making as this may vary depending on the churning temperatures used during different seasons of the year for best control of butter making process. However, cream that is to be shipped out of the plant shall be cooled to 45° F or lower.

When continuous churns are used, management should be encouraged to provide cream storage tanks equipped with effective temperature controls (cooling capability) and recording devices. When the tanks do not have product cooling surfaces and recording thermometers, discuss their desirability with management. Showing a recommendation on the report will not be necessary because these are not mandatory requirements and will not affect plant status (a “should” item of §58.321 and the 3-A Sanitary Standards).

If butter is manufactured with a continuous type churn, review plant practice regarding assignment of churn numbers. The churning number shall be changed when the tank of cream is emptied, whatever the number of boxes (or amount of butter) accumulated in the churning at that point. See Item B39–Boxes & Liners, E. Markings for more information.

Item B11–Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7–Housekeeping.

Item B12–Operations for Cream, Frozen Cream, Plastic Cream, Anhydrous Milkfat, Butteroil, and similar high fat products.

If you are inspecting a manufacturing operation for one of these products, cross out the word **Butter** in the upper right corner of Page B and write in the appropriate name of the product(s) (note that whey cream requires Page W rather than Page B). If the plant also has a butter operation or produces more than one of these products, you can use a separate Page B for each product or, when common processing facilities are used, combine the inspections on one Page B.

Cream

Check Items B1 through B11 as applicable. Use blank Item B12 for load-out facilities. Load-out facilities shall comply with the applicable requirements outlined in Item B31–Load-out Facilities.

There may be plants that ship or receive small amounts of cream in bag-in-box type containers consisting of a plastic liner with an attached spout inside a corrugated fiberboard container. When this type of container is noted, follow the guidelines of the applicable Items in B33 through B48 for the packaging operations and Items in B50 through B56 for storage and tempering operations.

Frozen Cream (58.305d, 58.327, 58.334b).

Check Items B1 through B11 as may be applicable. Also, inspect the pasteurized cream filling operation into the final containers (usually poly or lined fiberboard boxes).

Frozen cream shall be pasteurized at not less than 170° F for not less than 30 minutes by the vat method or not less than 190° F for not less than 15 seconds by the HTST method. If the plant also makes butter and uses the same HTST cream pasteurizer, check that recorder charts show the required higher temperature when processing cream for frozen cream. As another alternative, the unit can be reset and sealed to divert at 190° F for both cream for butter making and for frozen cream.

Plastic Cream (58.305e, 58.326, 58.334b).

The inspection will be similar to that for frozen cream except that an extra separator may be involved to achieve the higher milkfat content of plastic cream. (Usually 80%, as compared with 40 to 50% for frozen cream.) Also, special equipment may be used to cool the cream, such as swept surface heat exchangers or direct expansion type chilled roll units.

Pasteurization requirements are the same as outlined for frozen cream.

Plastic cream is made by a process (usually centrifugal separation) which results in a fat-in-water type emulsion. If the manufacturing process (such as churning) reverses the phase to water-in-fat type emulsion (similar to butter) the product shall be categorized as “Unsalted Butter” or “Concentrated Milkfat.”

Anhydrous Milkfat (58.503c, 58.325, 58.347).

Anhydrous milkfat is made by a separation process (usually multiple separation) from milk, cream, or melted butter. Following final separation to approximately 99% milkfat, the product is usually subjected to a heat treatment and to subsequent vacuumization to reduce remaining moisture to only a trace (less than .15%). The milk, cream, or oil shall be pasteurized following the procedure for cream for butter making (vat method at minimum 165° F for 30 minutes or HTST at 185° F for 15 seconds, using “3-A” pasteurization equipment).

Butteroil (58.305b, 58.318, 58.324, 58.347).

Butteroil is made by melting butter and removing practically all the moisture and solids-not-fat (composition requirements are outlined in §58.305b). When the plant makes butteroil with the same equipment used to make butter by the cream-to-oil-to-butter method, both inspections can be combined using one survey Page B, with modifications as necessary. In most other instances, using survey Page L with appropriate headings and items to cover the inspection would be best. The following major headings may be helpful:

A. Raw Material Requirements (58.305b).

To produce butteroil eligible for official certification, the butter used shall conform to the flavor requirements of U.S. Grade AA, A, or B and shall have been manufactured by a USDA approved plant. The butter used shall be suitable for human food and be stored and handled in a sanitary manner.

When inspecting a plant for P code approval, the raw material (butter) does not have to originate from a USDA approved plant and meet the U.S. Grade B or better requirements. Also, do not criticize the use of "return butter" such as outdated store returns. Store returns shall not be used in plants that request listing in Section I of the *Approved Plant Book*. However, do not criticize the use of "off-grade" butter with progressive flavor defects, butter that has been allowed to oil off, butter recovered after mold is scraped off, etc. if the plant has not requested official certification for the butteroil. However, it is unsatisfactory if any of the butter used is not fit for human consumption because of contamination from filth, insects, rodents, chemicals, etc., or if the butter has not been handled in a sanitary manner (for example, floor scraps, scrapings from exterior surfaces of packaging equipment, butter handled in rusty containers, etc.). If unfit butter is being processed, assign the INELIGIBLE status (category A deficiency). Also, recommend that such materials be excluded from butteroil operations and be satisfactorily disposed of for other than human food use.

Antioxidants are permitted to be used in the production of Butteroil (see §58.305b).

B. Storage of Butter for Melting (58.126, 58.311, 58.343).

See the guidelines for Items B50 through B56.

Check for storage under refrigerated conditions in a suitably constructed and maintained room or area prior to tempering. Butter stored in bulk containers shall be covered to protect the butter. If the butter is in boxes, cartons, or wrappers, look for exposed butter from broken or torn containers. Such butter should be protected by additional wrapping, covering, or placing in a larger protective container. All unsanitary butter shall be disposed of as scrap.

C. Melting Operations (58.318, 58.127d).

Inspect room construction, lighting and ventilation. Check that boxes and liners are removed in a sanitary manner. If the butter is in retail size packages, melting may be conducted first provided the wrapping material was clean and free of contamination. If packaging materials are wax coated, check that butter melting is conducted below the melting point of the wax (see the guidelines for Item B9–Butter Remelt Equipment). Culinary steam shall be used if melting is achieved with direct steam injection or if hot water is added which was heated by direct steam injection (see the guidelines for Item A36–Culinary Steam). The wrapping material can be removed afterward with various screen or sieve devices. Melting is usually conducted in jacketed processing vats. These vats shall be constructed of stainless steel. Also, check sanitation.

D. Separating Operations (58.128e, 58.127d).

Inspect the room construction, lighting and ventilation. Inspect the separator(s), following guidelines for Item B4–Separator. The separators will be of a special type to achieve very high butterfat content; however, the inspection requirements and procedures are basically the same.

Hot water is often added at the separator to aid in washing out the curd and salt. If direct steam injection is used to heat this water, it shall be of culinary quality (see the guidelines for Item A36–Culinary Steam).

E. Heating & Vacuum Treatment (58.128a, j, k, p).

Inspect the room construction, lighting, and ventilation. For inspection of vacuumizing equipment, follow the guidelines for Item B7–Vacuumizer.

It is usual practice to heat or pasteurize the separated oil either before or after a vacuumizing treatment for removal of remaining moisture. Check the condition and sanitation of heaters per the guidelines of Item A27–Product Cooler. Pasteurization of the oil is optional. However, if pasteurization is intended or required, (as for instance to comply with a purchase specification or buyer's requirement) check for "3-A" engineering (follow the guidelines for Item B5–HTST Sealed . . . and Item B6–HTST or Vat Pasteurizer).

F. Butteroil Cooling & Filling Operations (58.128a, j, k).

Butteroil is often cooled to a semi-solid viscous state before filling. Inspect the cooling equipment per the guideline for Item A27–Product Cooler.

Check that filling is conducted in a sanitary manner. Containers are usually filled directly from a pipeline.

G. Butteroil Storage.

Follow guidelines for Items B50 through B56.

Churning Operation

Item B14–Room Construction (58.126, 58.312).

See the guidelines for Item A1–Room Construction.

Item B15–Lighting & Ventilation (58.126d, e, 58.312, 58.313).

See the guidelines for Item A2–Lighting & Ventilation.

When bulk packaging or printing operations are conducted in the churning room, the atmosphere should be relatively free of mold or other airborne contamination. When tested by management, the mold count should be not more than 15 colonies per plate during a 15 minute exposure. Since this is a "should" item it is not necessary to verify the counts.

Item B16–Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3–Pumps, Pipelines, & Valves.

Use this item to cover the condition and sanitation of pumps, pipelines, and fittings used to convey pasteurized cream to the churn.

Also check that the pump and pipelines are properly sanitized before use. Chemical sanitizer solutions may be used. Flooding the system for five minutes with hot water maintained at 170° F or higher at the discharge end is another very effective sanitizing method.

The use of a cream filter before the cream enters the churn is optional when the pasteurization is done in a closed system such as the HTST method used in many plants. When vat pasteurization is used or when cream is transported from plant to plant, a filter should be used to collect any foreign material that may be present. The filter may be perforated stainless steel constructed for easy cleaning, or it may be of a single service disposable type. If no filter is used in an open system make an appropriate recommendation.

A cream surge tank is usually used to feed a continuous type churn. The fabrication criteria are the *3-A Sanitary Standards for Uninsulated Tanks for Milk and Milk Products, Number 32*- (surge tanks are included in the scope of 3-A Sanitary Standards for Uninsulated Tanks). See the guidelines for Item B6–HTST or Vat Pasteurizer.

Inspect such tanks and the feed pump (usually a positive type pump) carefully, including float or other control for maintaining a uniform level of cream. Also check that a cover is provided and used. On very long churning runs, bacteriological problems may develop from the foam in the surge tank. On such long runs, the churning operation should be stopped at intervals to empty and clean the tank, or two tanks should be provided for alternating use and cleaning. This should be done every four hours to preclude bacteria problems.

Item B17–Churn(s) (58.128a, 58.315, 58.316).

Conventional Churns (58.316).

Conventional churns shall be constructed of stainless steel or aluminum, free from cracks, and in good repair. Do not criticize slightly rough (sand blasted) interior surfaces in butter equipment as this is normal (the slightly rough condition is necessary to prevent butter stickage). However, when deep pitting or corrosion is evident, recommend replacement of the churn or repair of deteriorated areas.

On aluminum churns, check the sight glass and buttermilk outlet areas carefully as they are often unsatisfactory on older churns due to electrolytic corrosion. If noted, recommend repairs (the deteriorated areas can be cut out and replaced or built up and refinished). Check for cracked or broken areas, particularly around vane supports and door shells.

The door gaskets shall either be removed for hand cleaning or be firmly bonded to the metal door and cleaned in-place. Check for proper cleaning of the gaskets and appurtenances such as the buttermilk valve, the vent, etc. If a cream inlet fitting is provided, inspect it for condition and sanitation even if the fitting is not routinely used for filling the churn.

Cream-to-oil-to-Butter.

Show on the report when this type of butter making process is employed. Cross out the word "churn" for this item and replace it with "chiller." Prior steps in the cream-to-oil process can be covered by Item B4–Separator, Item B7–Vacuumizer, and by using appropriate headings for equipment such as prechurners (if used), oil standardizing vats, etc.

Inspect the chiller and "texturator" equipment for condition and sanitation. Some texturator equipment is mounted on wheels and some plants do not clean the units daily, but move them into the butter cooler to refrigerate the butter inside the unit. This practice should not be criticized if protection is afforded to butter at the inlet and outlet areas. A weekly schedule for emptying and cleaning such units is satisfactory under these circumstances.

Continuous Churns (58.315).

All product contact surfaces of continuous churns and related equipment shall be readily accessible for cleaning and inspection. Construction shall follow the applicable principles of the *USDA Equipment Guidelines*

Inspect continuous churns for compliance with these requirements. Check for freedom from dead ends, open seams, exposed threads in the product zone, hard-to-clean areas, access for inspection, etc. Make recommendations for correction as necessary. For sanitation inspection purposes, continuous churns can be divided into two main classes, depending primarily on their size and ease of disassembly for cleaning and inspection. These considerations require somewhat different inspection approaches.

A. “Small” churns that can be easily dismantled.

Inspection of small churns is very similar to other dairy equipment. Request that the churn be dismantled for inspection of product contact surfaces (this can usually be done by regular butter department personnel). Make recommendations concerning deficiencies in condition or sanitation.

In the cream churning section, check for sanitary constructed cream inlet fittings. Have the beater removed to inspect the hollow interior. (Product residues here suggest faulty seals.) Report as unsatisfactory any exposed threads or bolted joints on the beaters for churning or buttermilk removal. Inspect screens used for buttermilk removal for both condition and sanitation. Inspect, if possible, the buttermilk collection areas on the other side of the screens. If any areas are not accessible for inspection, recommend correction. Similarly criticize buttermilk outlet pipes with “double bends” (⊓) which cannot be inspected.

Look for butter or butterfat residues between working plates and header plates. (These parts often have metal to metal fit and permit product seepage into the interface areas.) Inspect couplings of working augers for butterfat residues, also the dosing ports for injection of salt slurry.

When CIP procedures are ineffective, recommend modifications to achieve satisfactory in-place cleaning or daily dismantling for cleaning by conventional methods. (If management feels that daily dismantling is not feasible, they should concentrate efforts on providing effective cleaning in-place.)

B. “Large” churns.

These machines have product contact components of such size, weight and complexity that disassembly is a major undertaking. Such dismantling is not feasible on a daily basis, so much reliance is necessarily placed on the CIP procedures that the churn manufacturer recommends.

Inspect these churns by dismantling and checking the same areas outlined above for “small” churns. If the machine has a vacuumizing chamber at the working section, check that butter does not leak into the chamber during churning operations and become trapped in the dead end. Also, check for satisfactory cleaning of the vacuumizing chamber and its fittings.

When sanitation deficiencies are noted, recommend modification of the equipment or the cleaning regimen as necessary to achieve satisfactory in-place cleaning. The usual option of daily dismantling for hand cleaning should not be mentioned, as this approach would be impractical and contrary to recommendations of the equipment manufacturer. Do not try to specify how to correct deficiencies related to the equipment design or engineering. Plant management or the equipment manufacturer should initiate any modifications for sanitary reasons.

C. Salting Equipment.

Both large and small continuous butter makers have auxiliary equipment for injecting salt slurry with a small positive type “dosing pump.” The salt slurry is usually made up at about 50% concentration using very fine-textured microcrystalline salt. At this concentration, only part of the salt is in solution and the rest is kept in suspension by vigorous agitation in the slurry tank. Sometimes color, lactic acid, or starter, is injected into the butter. It is not necessary to dismantle the salt pump or to empty the slurry tank for inspection. The high salt concentration should preclude bacterial growth. However, if the tank is not clean or has an excessive salt buildup on interior or exterior, recommend cleaning.

The slurry tank(s) should be constructed of stainless steel of a type resistant to salt corrosion, or of a suitable nontoxic plastic material. A cover should be provided for use during shutdown periods to protect leftover slurry during cleanup operations. There is no objection to leaving the cover up or off during butter making operations if the tank is in a suitable area where contamination is unlikely. However, when the tank is in an area requiring protection against contamination of the salt slurry, a cover shall be provided and used continuously. Use this item for the slurry tank and Item B19–Salt Storage & Handling for other deficiencies noted in salt storage or handling.

Item B18–Water (Wash & Composition) (58.127a, 58.338).

When the butter is not washed show NA in the satisfactory column for this item.

When the butter is washed with buttermilk, which may or may not be further cooled, be sure to inspect related equipment for recirculating or cooling the buttermilk. Management should be alerted to the potential for serious bacterial problems if buttermilk is recirculated for long periods.

When the butter is washed with water, the system shall be approved by the regulatory authority. Only safe potable water of acceptable microbiological quality shall be used for washing the butter granules. When chlorinating treatment of the wash water is necessary, the required level of chlorination will depend greatly on the quality of the water, the amount of organic material present in the water supply, and the pH, temperature and treatment time. Much lower levels of chlorination will suffice when the batch treatment method is employed. When the water is treated by the in-line injection method which results in short exposure time to the chlorine before the use of the water, considerably higher levels of chlorination might be required.

Overall, chlorination should be kept as low as necessary to maintain the desired bacteriological safety, for overuse of chlorine will affect the fine delicate flavor of butter and may also cause a chemical flavor.

Makeup water for composition control should also be treated when chlorination of the wash water is necessary. When wash water is handled by the batch method in a separate tank for

chilling or chlorination prior to use, inspect the tank and pipe lines for cleanliness. The tank should be stainless steel or equally corrosion-resistant material.

It is required that water be filtered before entering the churn. This may be accomplished by either an in-line filter or other suitable filter that will remove sediment or foreign material. When no filter is used make an appropriate recommendation. The portion of wash water piping from the final filter to the churn shall be stainless steel or approved tubing that can be easily cleaned and maintained in a sanitary manner.

Item B19–Salt Storage & Handling (58.126e).

When batch type churns are used, a limited supply of salt is usually stored in a bulk container in or near the churn room. Check that the container is constructed of stainless steel, plastic, or other suitable material and is provided with a tight fitting cover. Check that suitable scoop, pail, scales, etc. are used to measure and transfer salt to the churn. At very small churning operations, the butter maker may prefer to scoop the salt directly from the bag without use of an intermediate bulk storage container. There is no objection to this practice if the top of the bag is folded over after each use and the bag is kept in a clean dry area.

For continuous churn operations, the microcrystalline salt slurry is made up directly in the injection tank or in a pre-slurry tank which feeds into the injection tank. Check that the immediate supply of bagged salt is stored satisfactorily and is emptied into the tank in a sanitary manner by first vacuuming or removing the outer paper ply from the bags.

If super saks are used see the guidelines for Item D45. If a blower type salt conveyor is used, check that the conveying air is filtered. There are no standards for minimum efficiency for such filters. Show as satisfactory if the air is filtered.

Item B20–Miscellaneous Utensils, Carts, Etc. (58.128a, 58.317).

Check for cleanliness and condition of miscellaneous items such as box forms, conveyors, pails, butter striker, paddles, and other related items in this department. Hand tools used for butter packing, such as strikers and paddles shall be constructed of stainless steel, aluminum, or suitable plastic (no wood or wooden handles).

Check that product contact surfaces of trucks or carts for bulk butter are constructed of aluminum, stainless steel, or other corrosion resistant metals, free from cracks or seams and with a surface that is relatively smooth and easily cleanable.

Item B21–Hand Washing Facilities (58.127c).

A hand washing sink shall be provided. It shall be conveniently placed and used by the employees. The use of a COP tank as a hand washing sink is not acceptable. Hot and cold running water, soap, and single service towels or an air drier shall be provided. The use of a hand dip sanitizer station should be encouraged but is not a suitable alternative to a hand

washing sink. Containers shall be provided for used towels and other wastes. The containers may be metal or plastic, disposable or reusable, and should have self-closing covers. Cloth towels for common use or mechanically dispensed roll type cloth towels are unsatisfactory, recommend provision of single service towels or air driers.

Hand washing sinks should be equipped with trapped drains and be connected to a sanitary sewer. Nevertheless, a straight pipe draining to the floor in a wet processing area is a minor deficiency and need not be recorded on the report. However, when a recommendation is made for floor replacement or major floor repairs, include a recommendation that enclosed sink piping be provided also.

Item B22–Quality Tests (58.335 through 58.337).

A. Keeping Quality (KQ) Tests (58.336f).

When the creamery is experiencing butter stability problems (cheesy, putrid, rancid, etc.) recommend that the plant perform 72° F for 7 days KQ tests on each churning. After the problem is corrected and a satisfactory history is established, the testing frequency might be reduced at the option of the plant manager. Optionally, the manager may choose to use the faster 98° F for 48 hours test in place of, or in addition to, the 72° F for 7 days test. (When official USDA tests are made, the 72° F for 7 days method is required.)

On a routine survey, show this item as satisfactory if the plant is regularly making KQ tests on at least some churnings, by either test method, to maintain a satisfactory KQ history. If no KQ tests are performed, make an appropriate recommendation.

At plants that have resident grading service, the USDA inspector may routinely make an official KQ test on each churning and this would satisfy the company KQ testing requirement.

B. Acid Degree Value (ADV) or Free Fatty Acid (FFA) Tests (58.336c).

These tests–ADV for cream and FFA for butter–should be run as often as is necessary to aid in the control of lipase activity. The necessity for running these tests vary widely depending on the type of cream handled by the plant. For instance, if only sweet cream is received from whole milk plants which belong to the same company and the cream and butter history is free of lipase problems, routine FFA tests would not be required. On the other hand, if the plant receives surplus cream at irregular intervals from a variety of sources, it would be prudent to monitor lipase activity in the cream by frequent FFA testing.

During a routine plant survey, it is not necessary to check or report on plant practice regarding these tests. However, when the plant is experiencing problems with lipase activity or rancid flavors, recommend that these tests be made to assist in correcting the problem. Assign this deficiency to category C if the plant has lipase-rancid problems and is not running ADV or FFA tests.

Item B23–Composition Control Facilities (58.336, 58.338).

Check that a satisfactory area is provided for running composition control tests. The area should be clean and the scales should be protected against air drafts. Scale weights should be accurate and cups should be in good condition.

Complete analyses for composition should be made as often as necessary to assure adequate control. Check this item satisfactory if the plant is running composition control tests.

It is not the responsibility of the inspector to check for proper performance of the composition tests, computation of water to be added, or operation of the churn with respect to control of composition.

When tests are not being performed during the survey, show a dash in the satisfactory column to show that this item was not checked.

Requirements for salt, color, starter cultures, and starter distillate are outlined in §58.328 through §58.331. If deficiencies are noted regarding these optional components, show the applicable recommendation under this item.

Item B24–Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7–Housekeeping.

Buttermilk Handling

Determine and report how buttermilk is used. When used at the plant as an ingredient for a human food product, show the product made, such as dry buttermilk, dry dairy blends, ice cream mix, etc. For plant approval of the final manufactured product, inspection of fluid buttermilk handling is required, as outlined in this guideline, but separate listing of the "Buttermilk" ingredient is not necessary.

If a neutralizer is added to the buttermilk, recommend the practice be discontinued. If neutralization continues assign the INELIGIBLE status (category A).

If shipped from the plant, show the name and address of the company receiving the buttermilk. Ask the plant manager whether or not USDA approval for buttermilk is requested, if so continue with inspection as outlined below. If the manager does not want inspection and approval, show NA for this section.

If the buttermilk is shipped in condensed form, the survey shall additionally cover the pasteurizer and evaporator using the appropriate items on Page D, or when reverse osmosis (RO) membranes are used to condense the buttermilk, inspect the unit and the pasteurizer using the appropriate items on Page M. When an evaporator is used, status for "Condensed Buttermilk or Buttermilk Product" can be assigned. If RO membranes are used, status for either "Condensed Buttermilk or Buttermilk Product" or "RO Concentrated Buttermilk or Buttermilk Product" may be assigned. Follow the plants request in this regard.

Note:

> Ultra-filtration (UF membranes) cannot be used to produce "Condensed Buttermilk or Buttermilk Product." UF membranes remove other product constituents in addition to the water.

Item B27–Buttermilk Tanks (58.128d).

See the guidelines for Items A28–Storage Tanks - Silo & A29–Storage Tanks - Horizontal.

Item B28–Buttermilk Cooler (58.128, i, j, k, 58.234).

See the guidelines for Item A27–Product Cooler.

Unless the buttermilk is promptly processed within two hours, it shall be cooled to 45° F or lower prior to storage. Normally, the plant should have a cooler for this purpose, although under certain conditions, satisfactory cooling may be achieved with cold-wall type storage tanks.

Item B29–Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3–Pumps, Pipelines, & Valves.

When buttermilk is used for animal feed, the pumps, lines and tanks need not be of sanitary construction but this equipment should be maintained clean and not contribute to unsatisfactory sanitation, odors, insect control, or contamination in the processing area. (With animal feed disposition, no USDA status is necessary or appropriate.)

When the buttermilk is used for human food, dismantle the buttermilk handling equipment and inspect for condition and sanitation. If buttermilk pipelines are to be cleaned by CIP procedures, proper fittings and "3-A" engineering shall be provided, including a return circuit, a recording thermometer, etc. Alternatively, the pipelines may be cleaned by the daily take-down procedure.

Item B30–Miscellaneous Equipment (58.128a).

A few creameries separate buttermilk to recover some remaining butterfat. There are no restrictions on the use of such cream. Follow the guidelines for Item B4–Separator.

If a rotary fine saver is used see the guidelines for Item C30–Fines Return & Fine Saver.

Item B31–Load-out Facilities (58.131d).

Load-out facilities shall comply with the same requirements as outlined in Items A10 through A15 if the trucks are washed in the load-out facilities.

When buttermilk is loaded into bulk trucks under out-of-doors conditions with a direct connection between the load-out hose and the tank valve, a concrete slab, drain, and water hose constitute the minimum facilities. Also, a vent filter shall be used. If the tank is sampled or loaded (without a direct connection) through the top, a roof shall also be provided.

Also inspect the load-out pump, lines, and valves, in accordance with requirements outlined in the guidelines for Item A12–Pumps, Pipelines, & Valves.

Butter Packaging

Item B33–Room Construction (58.126, 58.313).

See the guidelines for Item A1–Room Construction.

Item B34–Lighting & Ventilation (58.126d, e, 58.313).

See the guidelines for Item A2–Lighting & Ventilation.

Light intensity shall be at least 50 F/C at the working surfaces in the areas where butter is stripped and inspected. Other areas of the packaging room shall have at least 30 F/C. All lights shall be protected against breakage.

The room(s) shall have adequate ventilation and be free of objectionable odors. Air in the room should be relatively free from mold (not more than 15 colonies per plate, during a 15 minute exposure) or other airborne contamination. Since this is a "should" item it is not necessary to verify the counts.

Item B35–Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3–Pumps, Pipelines, & Valves.

Use this item to record any deficiencies in the lines between the butter boat or silo and the packaging machines.

Do not criticize slightly rough (sand blasted) interior surfaces.

Item B36–Butter Boat/Silo (58.126, 58.317).

This equipment shall be made of aluminum, stainless steel, or corrosion resistant metal. It shall and be free from pits, cracks, etc. Do not criticize slightly rough (sand blasted) surfaces as these are normal to reduce butter stickage. Plastic or rubber product contact surfaces for limited use in such equipment shall comply with the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* and FDA requirements in *21 CFR 170-199* or the *3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-* and FDA requirements in *21 CFR 177.2600*.

Augers and butter pumps used in butter boats or packers shall be dismantled for inspection. Pull augers forward to inspect rear seals and couplings as well as those in front. When fiber bushings are noted in product contact areas, recommend replacement with materials that comply with the 3-A Sanitary Standards for plastic or rubber. In addition to checking sanitation of product contact areas, inspect the exterior surfaces of the equipment, such as frames and

underside areas. Describe any deficiencies and make appropriate recommendations for correction.

Item B37–Miscellaneous Utensils, Carts, Etc. (58.128).

See the guidelines for Item B20–Miscellaneous Utensils, Carts, etc.

Item B38–Bulk Butter Packaging Machine (58.128, 58.319).

Use this item to cover automatic or semiautomatic equipment for packing bulk butter into bulk boxes. The bulk butter packaging machine shall comply with the *3-A Sanitary Standards for Equipment for Packaging Viscous Products, Number 23- .* The most common units are the semiautomatic types that have one or two large augers to push the butter through a large cutting head directly into a lined box. The filled box is then tipped upright onto a platform scale where the operator adjusts the butter weight with a stainless steel or aluminum striker or spatula and then folds the liners and closes the box.

Inspect bulk packaging machinery in the same way as outlined for Items B17–Churn(s) and B36–Butter Boat/Silo. Arrange with butter room personnel for dismantling as necessary to inspect butter contact surfaces. These surfaces may be slightly rough (sand blasted) to avoid butter stickage, but shall be free of deep pitting or cracks and be satisfactorily cleaned by the methods employed. Make recommendations as may be applicable.

Hot water hosing of equipment parts as the sole method of “cleaning” is not a satisfactory practice. Supplementary use of proper cleaning materials is necessary to remove fatty films and protein from all surfaces. This may be accomplished by several procedures, including hand brushing, foam cleaner applications, or use of high pressure cleaning jets employing a cleaning solution.

Item B39–Boxes & Liners (58.320, 58.339, 58.342).

If butter is packed on flat carts (such as slab butter), in lined plastic or metal baskets, or other bulk packages, describe packaging on the report. Also consider if the packaging is adequate to provide protection to the butter.

A. Boxes (58.339).

If poor condition used boxes are being filled, or if the reuse of boxes from another plant is noted, recommend correction. However, do not criticize the practice of reusing good condition boxes for rework.

B. Parchment liners (58.320, 58.339).

Prelined boxes shall be protected from possible contamination prior to filling. Protection may be accomplished by alternately inverting one container over the other or by stacking the lined

boxes on their sides in a rack, until ready for use. When lined boxes are not used the same day, check that the liners are removed and either discarded or retreated before reuse. Assign this deficiency to category D if an excessive number of boxes are prelined. Assign this deficiency to category B if the prelined boxes are not protected from all sources of contamination or are left on the floor where they are subject to splashing water, traffic, and other sources of contamination.

Proper treatment of parchment liners is very important for protection of the butter against mold development. The liners shall be treated by complete immersion in a 15% salt solution (a brine that consists of 15 pounds of salt for every 85 pounds of water) and boiled for not less than 30 minutes. The brine solution shall be in a suitable, covered, corrosion-resistant container (preferably stainless steel). Liners should be held in this solution until used. To assure uniform exposure to the brine solution, the liners should be sufficiently separated prior to treatment. The brine solution shall be strengthened or changed as frequently as necessary to keep the solution full strength and in good condition.

Check the solution strength with the salimeter and report the percentage of salt in the solution. When salimeter test shows less than 15% but more than 10%, assign this deficiency to category D. When less than 10%, assign this deficiency to category C. If the plant does not use any salt treatment or no evidence of salt can be detected on the liners, assign this deficiency to category B.

Heating of the brine solution is usually accomplished with steam through jacketed tank surfaces or through a stainless steel coil in the tank. Direct steam injection heating is also satisfactory under the following circumstances:

1. The portion of the steam injection piping which extends into the tank is constructed of stainless steel.

2. Culinary steam is used or the steam piping is equipped with a bypass line and valve to allow “blow-down” of the iron piping prior to beginning the heating process. (Culinary steam is not required: it is optional.)

3. The above-mentioned piping is set up at the treatment tank. Use of a plant hose for direct injection steam heating is not satisfactory.

When salt strength is satisfactory, but the required 30 minute boiling treatment is not properly carried out (whether the heating is insufficient or the treatment period too short), assign this deficiency to category C. If no method is provided for boiling or heat treatment, assign this deficiency to category B.

C. Polyethylene Liners (58.339).

When polyethylene liners are used, boxes should be lined just before packing of the butter.

Liners shall be protected from contamination prior to actual use. Usually the dispensing device provides such protection.

Normally, sanitizing of the polyethylene liner surface should not be necessary if liners are inserted just before use and the butter is packed in a clean environment. However, it is managements' option to employ additional safeguards if desired. Use of sanitizer sprays or fogging procedures on polyethylene liners should not be criticized unless excessive amounts are used causing surface off-flavor, bleaching of surface color, free liquid within the bag, etc. In such instances, recommend that lesser strength or amount of sanitizer solution be used.

D. Package finish (58.339c).

Check a few filled butter boxes to determine if the butter surface is smooth and even, with all the corners filled. Rough surfaces showing holes or hand prints, corners not filled, and exposed butter not covered by liners are unsatisfactory conditions; recommend that packaging technique be improved.

E. Markings (58.342).

Check enough butter containers to decide whether applicable and legible markings are present. Commercial bulk butter boxes shall be legibly marked with the name of the product, name and address of manufacturer or other assigned plant identification, churn number, and net weight.

If butter is manufactured with a continuous type churn, review plant practice regarding assignment of churn numbers. For official grading service, each churning shall contain no more than 20,000 lbs. of butter and each container of butter in the churning shall have been consecutively produced. It is necessary to have uniform butter quality throughout the churning so that an assigned grade will accurately apply to all the butter in the churning. Therefore, the churning number shall be changed when the tank of cream is emptied, whatever the number of boxes (or amount of butter) accumulated in the churning at that point. If the same churn number is used for butter from different tanks of cream, noncontinuous production runs, or any other situation where the butter is not uniform throughout the churning show the information on the report and make a recommendation for proper designation of churn numbers. There is no objection if the plant assigns the same churn number to multiple packaging machines being fed from the same churn or butter silo.

Although it is not a recommended practice, the continuous churn at some plants is supplied with cream from a common header connected to several tanks. It is not intended to restrict such blending of cream from more than one tank for feeding the churn provided that the same cream blend proportions are maintained throughout each churning.

Similarly, there is no restriction against assignment of a common churning number to the well-mixed production of two continuous churns, for example, two churns feeding one bulk butter boat. In such cases both churns shall be supplied from the same tank of cream and the churn operator should be alert for identical machine operation, same salting rates, composition control, etc., so that the mixed butter will be uniform in quality characteristics.

If either of these procedures is not properly controlled to yield uniform quality butter within a churning (with respect to flavor, color, salt, body and composition), recommend that such control be established or that the procedures to assign churn numbers be changed as necessary.

When a conventional churn is used, there is no objection to blending of cream from more than one tank into the same churning. The churning time of approximately 45 minutes provides ample mixing to assure uniform quality in the finished butter.

When the cream-oil-butter continuous churn process is used, the assigned churn number shall reflect butter production from a separate tank of standardized butterfat. The churn number should be changed when the continuous chiller and texturator equipment is switched to a different tank of butterfat. If this is not being done, recommend correction.

Item B40–Butter Handling Procedures (58.340).

If the plant has not requested status for consumer sized packages show NA for Item B40–Butter Handling Procedures through Item B45–Whipped Butter Packaging.

Use this item to assess the methods and practices used to handle the bulk butter prior to packaging in consumer sized packages and make appropriate recommendations for correction when needed.

A. Area Where Boxes are Removed (58.l26, 58.340).

The butter boxes shall be removed in a room separate from the printing room. Also, air movement should be from the print machine(s) toward the stripping area.

Use this item to check that box removal is conducted in a satisfactory room or area. Check the construction, lighting, air movement, etc.

B. Stripping Procedures (58.340).

Fiber boxes shall be removed in a way that precludes contamination of the butter. The boxes shall be removed prior to handling of the butter at the precutter platform.

Care should be exercised by plant employees to keep hands off the butter if they are stripping or otherwise handling the fiber boxes. The same employee shall not alternately handle the outer cardboard containers and then handle the butter directly unless the hands are washed or sanitized prior to handling the butter. Use of a properly maintained sanitizing solution at the cutting station prior to handling butter is satisfactory. In lieu of this, a separate employee shall remove the outer shipping containers (there is no objection to an employee alternately handling only liners and butter).

Item B41–Precutters, Chutes, & Conveyors (58.128).

This item refers to methods used for transfer of bulk butter into the micro fix or the packaging machinery. Special attention should be given to the procedures for feeding the precutter and transferring of quarter slabs to the machines. For small operations, the unboxed cubes might be piled on carts or, with proper precautions, on pallets for movement to the precutters. For large packaging operations, endless conveyors may be employed (see Item K18–Tables & Conveyors).

Inspect the precutter for any deficiencies with respect to construction, maintenance or sanitation. Check carefully for serious pitting or for broken seams. Any wooden parts in the product zone, such as wooden rollers, guide rails, etc., should be criticized. Recommend replacement with plastic materials that meet the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* (and *21 CFR 170-199*) or stainless steel.

Steel precutter wires are often used because of breakage problems with stainless steel wires. Such nonstainless wires should not be criticized if maintained in a rust-free condition (coating lightly with mineral oil after cleaning will prevent rusting). Dirty or rusty wires should be criticized and recommendation made for replacement.

Chutes that feed packaging machines shall be made of stainless steel and be free of hard to clean areas such as open seams, rough welds, and skip welds. Report details of any deficiencies regarding construction or sanitation.

Check the method used for conveying butter from the stripping area. Use of forklifts in the print room powered with either gasoline or propane combustion type engines should be criticized. In such case, recommend replacement with either hand or electrically driven units.

Item B42–Micro Fix (58.128, 58.317).

The micro fix shall be dismantled for hand cleaning. This includes removing the augers and the grinding blade (sometimes called the reel or squirrel cage) and associated bushings. Inspect these parts for condition and sanitation. Also check the underside of the inverted V cover (if one is used), the butter chute, and the outlet.

Item B43–Packaging Machine(s) (58.128, 58.319).

Butter packaging machines shall comply with the *3-A Sanitary Standards for Equipment for Packaging Viscous Products, Number 23-*. Older packaging machines that do not comply with this standard are acceptable under the grandfather policy. These grandfathered machines must be brought up to current standards if they are moved to a new plant.

If butter is manufactured with a continuous type churn, review plant practice regarding assignment of churn numbers. The churning number shall be changed when the tank of cream

is emptied, whatever the number of boxes (or amount of butter) accumulated in the churning at that point. See Item B39–Boxes & Liners, E. Markings for more information.

A. Print Machines.

Inspect the print machines for condition and sanitation. Arrange for dismantling to the extent necessary to make these determinations. Aluminum parts are not acceptable on new machines but are common on grandfathered machines. Pay particular attention to the following areas.

1. Product contact parts made of plastic (bushings, plungers, impellers, etc.) shall have a surface finish at least as smooth as a number 4 finish, with proper radii on interior angles and in O-ring grooves. Plastic shields or sight glasses in product contact areas shall also be as smooth as a number 4 finish and therefore, should be noted if they are cracked or chipped.

2. Hoppers and augers should be stainless steel but aluminum is acceptable on grandfathered machines. Aluminum parts are unacceptable if pitted, cracked or damaged in such a way to not be cleanable. Brass parts must be replaced. Augers with brass bushings should be noted. Recommend replacement with stainless steel or other suitable material.

3. While sand blasting is not acceptable on new or replacement equipment, some product contact surfaces can be made rougher by shot peening. Grandfathered machines with a sand blasted surface should not have deep pits or grooves. On new packaging machines augers, auger troughs, auger components, auger supports, fill necks, discharge ports, hoppers, bodies, baffles, and dividers can have a surface texture rougher than a number 4 finish if the surface modification is accomplished by shot peening (see paragraph D1.1.2 in the 3-A Sanitary Standards). This was added to address the issue of butter sticking to smooth surfaces.

4. Carefully check the area at the outlet (or throat) of the hopper for condition and sanitation. Removing the hopper at each survey is not necessary if the previous survey shows satisfactory cleanup. When a hopper is removed, check the gasket or O-ring for sanitation and condition. If the plant has multiple print machines, record which one the hopper was removed from so that a different machine can be checked during the next periodic survey.

5. Examine any grease fittings on the wrapper plunger and wrapper folding arms. These shall be wiped clean of grease prior to start-up. Recommend removal of any grease fittings on product contact surfaces. Also, the wrapper folding arms on older units are sometimes painted or brass. Recommend that paint be removed. Peeling paint on these parts is a serious deficiency (category B). Recommend that any new or replacement parts be made of stainless steel.

Augers and other parts of older Morpac and Doering machines are often constructed of “dairy metal” alloy. These materials are unsatisfactory (see the guidelines for Item A3—Pump,

Pipelines, & Valves), recommend replacement with stainless steel and assign the deficiency to category C.

These augers are susceptible to leaks because cracks or pits in the auger will allow leakage of the tempering water into the butter. This is a potentially serious condition as the water can then contaminate the butter (category A deficiency). The company should periodically make tests of the augers to make sure they are sound and free of leaks. This can be done by capping off the water outlet pipe and allowing full water system pressure to be built up within the augers. Then all exterior surfaces of the augers should be examined for moisture. Frequency of such testing would depend on condition of the machine.

On Morpac machines, inspect the revolving drum feeding device. These drums and their vanes should be dismantled daily for cleaning.

Some Morpac machines have been equipped with “butter savers” of various designs. The purpose of these units is to collect excess butter extruded at the forming head. Instead of falling to the frame of the machine, it is conveyed by means of stainless steel pipes or tygon plastic hoses back to the feed hopper. Such devices are satisfactory if they are properly constructed and if the cleaning regimen in daily use does an effective job of cleaning the unit. Construction or sanitation deficiencies should be covered by recommendations for correction. Request company assistance in dismantling such units for inspection. Special tools and skills are often necessary for dismantling and reassembling.

When inspecting a Benhil printer, lift a cell and inspect the area under the turntable.

Also inspect the exterior frame surfaces of the print machines and make any applicable recommendations concerning sanitation, painting, rust, etc.

Where machine control lever extensions are needed by the company, metal chains or rods may be used, but use of rope, twine, etc. is unsatisfactory.

Conveyor belt material used to convey wrapped butter should be made of USDA accepted belt materials to facilitate cleanup. When canvas belting is noted on such conveyors, recommend replacement, as it cannot be properly cleaned. Use of endless type belting should be recommended where this style of belting can be readily accommodated by the machine design. This may not be practical however, on some older machines designed for metal spliced belts. Metal spliced belts are not acceptable for exposed product conveyors.

B. Continental Machines.

These machines are very similar to the machines that package larger sizes. In all cases the machine must be dismantled for hand washing of the product contact surfaces. The hopper and augers may be replaced with a cylinder and a pneumatic piston designed to keep a constant pressure on the in-feed. Inspect the piston and housing carefully. Check for greasy product residue, proper radii in the O-ring grooves, etc. If brass is used for bushings, wrapper folding arms, etc. recommend replacement with stainless steel or approved plastic.

C. Patty or Reddi Machines.

Although some areas of patty machines are constructed quite differently, the same general guidelines for inspection of print machines apply.

On Reddi machines, the butter feed device should be dismantled for inspection. Check sanitation and for proper radii in O-ring grooves, number 4 finish, etc. The rotary butter forming section equipped with sliding pistons for ejecting the butter pats cannot be readily dismantled for cleaning. However, on the Redmond machine it can swing out, making it possible to inspect the product contact surfaces. Check for greasy product residue in the crevices between these moving parts. In addition, check the bottom of the take-away chain for sanitation.

D. Butter Cup Machines.

Like other butter packaging machines, these require dismantling and hand cleaning. The feeder plungers may have nonremovable plastic ends that are pressed on and the nozzles may not be removed from the head. Inspect these two areas for greasy product residue in the crevices between parts. Also inspect the feeder tubes, located above the inlet, and the portioning valves. All parts, whether Stainless steel, plastic, or rubber, shall be clean and fabricated to meet product contact surface requirements (proper radii in O-ring grooves, number 4 finish, etc.).

E. Canning Operations.

For butter, butteroil, or ghee canning operations use the applicable items on this page or Page L with appropriate headings. The following guidelines apply:

1. Inspect the extruder machine for condition and cleanliness.

2. Check the construction and housekeeping in the area where empty cans are stored. Cans are usually protected from contamination by storage inside fiber shipping boxes or inside large paper enclosures. When such packages are damaged, other means of protection should be provided (transfer into other containers, covering with sheets of plastic, etc.).

3. Check the area where cans are fed into the conveying system to be filled. If there is excessive lint or dust from the cardboard or paper cases, this operation should be separate from the filling area.

4. Check that cans are transferred to the conveying system ln a sanitary manner.

5. Clean compressed air shall be introduced into each open can to blow out any loose lint, dust, etc. Preferably this operation should be conducted outside the butter packaging room (an exception might be made when satisfactory provision is made for preventing the spread of the material blown from the cans). The flow of air may be either

intermittent or continuous but should have sufficient pressure and be so directed as to accomplish proper cleaning of the cans. From this point to the point where the cans are filled there should be a cover over the conveyor. The cover shall be provided if there is a possibility of contamination.

6. Check that sanitary procedures are followed in filling of the cans.

7. Exterior surfaces of the sealing machine should be kept clean. Rollers that perform the crimping and sealing operations should not leave a grease residue on the can rim. This would be a sign of excessive greasing or other malfunction. If noted, recommend immediate correction.

8. Satisfactory coding equipment should be present.

9. Packaged cans of butter should be free of butter residues around the cover or butter smears elsewhere on the cans. Check the item satisfactory if cans are routinely inspected and wiped when necessary (when the plant is canning butter under a government contract, checking of actual plant performance is the responsibility of the inspector who does the condition of container examination).

10. Check if satisfactory facilities are present for packing, sealing and coding fiber boxes.

11. Check that satisfactory scales are provided. For minimum accuracy and graduation requirements, see the guidelines for Item B46–Scales.

Item B44–Butter Whipping Equipment (58.128).

If the plant makes Whipped Butter and wishes to have this code listed in the *Approved Plant Book*, inspect all the equipment involved in the whipping operation. A variety of equipment is used for this process. Dismantle it and check for condition and sanitation. If a scraped surface heat exchanger is used, see the guidelines for Item A27–Product Cooler.

Sometimes nitrogen is incorporated during the whipping process, but more often air is used. This is entirely a management option: USDA has no recommendation in this regard.

Item B45–Whipped Butter Packaging (58.128, 58.319).

Show NA in the satisfactory column for this item if the plant does not package whipped butter, if the whipped butter code is not requested, or if the packaging machine is used for other butter products and is included in Item B43–Packaging Machine(s).

Usually the whipped butter is immediately packaged into consumer size packages. Follow the guidelines for Item B43–Packaging Machine(s) for inspection of the packaging equipment for consumer sized containers.

Item B46–Scales (58.128m).

(There is a printing error in the first table of tolerances as published in the General Specifications. The last line should read 51 to 100 instead of 51 to 500.)

Scales shall comply with National Bureau of Standards requirements. Compliance shall be determined by the appropriate regulatory authority. Usually this will be a state or local department of weights and measures that checks scales routinely.

For weighing boxes of butter in the 31-50 pound net weight range, the scales should have accuracy within ½-ounce and smallest graduations should be no greater than one ounce. Deficiencies regarding scale graduations or accuracy tolerance will not be considered as a significant factor in the assignment of plant status. (If official test-weighing is requested, a suitable accurate scale shall be provided as outlined in separate instructions for inspection, sampling, and test weighing. The inspector involved would be responsible for checking that the scale is suitable and accurate.)

For weighing butter boxes in a creamery, a stainless steel platform is recommended (other surfaces usually become rusty or hard to clean from the corrosive effects of chlorine and salt solution from the box liners). Also, inspect the scale underside and supports for cleanliness and make recommendations as necessary.

Item B47–Handling of Rework & Scrap (58.142, 58.338).

See the guidelines for Item A34–Sanitary Practices.

A. Rework Butter.

For the purposes of this instruction the term “rework butter” applies only to good condition, clean butter that is suitable for human consumption.

The most common source of rework butter is malformed prints caused by temporary malfunction of the packaging machine. It may also refer to good condition butter removed from the sanitary product contact surfaces of the churn, packaging machines, butter silos, etc. If salvaged, rework butter shall be collected in a sanitary manner and saved in suitable, sanitary containers prior to its reintroduction into the packaging machinery or remelt equipment. Such butter shall be stored in good condition stainless steel containers, in lined butter boxes, or in other suitable containers and promptly reintroduced into production (within two hours). If the rework butter is not promptly reintroduced into production, it shall be properly covered and placed into cooler storage or discarded.

If the plant requests listing in Section I of the *Approved Plant Book*, the rework butter shall only emanate from the butter manufacturing or printing operation. Commingling of butter for rework from other USDA approved plants is not permitted. Returned products (store returns) shall not be considered rework butter and shall be included with the operations inedible or waste butter.

If commingling of butter from other plants, or use of returned butter is observed, recommend the INELIGIBLE status for all "B" codes (status at a "P" code plant would not be affected, provided the collection and handling of the rework comply with the other parts of this item).

Separation of butter from packaging material can be accomplished either in a melt tank as described in Item B9–Butter Remelt Equipment or in equipment especially designed to perform this function.

When inspecting butter salvaging equipment check for sanitary construction, proper sanitation, and maintenance. Refer to the *Accepted Equipment List* to determine if the equipment design and fabrication have been reviewed and accepted by the Dairy Grading Branch. Whatever the procedures used to remove the packaging material, the rework butter shall be handled and stored in a sanitary manner. After the reworked butter has been melted or processed and all the extraneous material has been removed, it shall be repasteurized prior to churning.

If the plant is not handling their rework butter according to these guidelines, recommend appropriate modification in handling practices to insure compliance. If unsanitary handling practices such as collecting rework butter from unsanitary surfaces of the print machine or the floor, rework butter being stored in unsanitary containers, etc. are found, recommend the INELIGIBLE status (category A deficiency).

B. Disposition of Waste Butter.

Waste butter is not considered suitable for human use because of contaminants, dropping on the floor, etc. It shall be labeled as "INEDIBLE," or "WASTE BUTTER," or "NOT FOR HUMAN CONSUMPTION," or otherwise clearly marked, and be kept strictly segregated from rework butter. If handling, storage, or disposition of waste butter is unsatisfactory, recommend appropriate corrective measures. Show sufficient details about the deficiency so that the National Field Director can assess the seriousness in the determination of plant status.

Item B48–Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7–Housekeeping.

Check that the print room supply of packaging material (wrappers, cartons) is protected from contamination. At the end of the day's operations, partial rolls of packaging material from the machines shall be protected with plastic or be placed in enclosed cabinets during the clean up operations. Used boxes should be accumulated in a neat manner and be removed from the stripping area on a regular basis. Also, check the secondary storage area for these used materials and on their ultimate disposition from the plant.

Use of clean cardboard on the floor at the machines for safety reasons is satisfactory. However, the cardboard should be changed daily or more often if necessary. Sometimes floor racks are provided for workers at the machines to provide proper working height and to avoid

slippery floor conditions. Such racks should be constructed of metal or plastic in sections that can be easily moved for cleaning. If they are not, make applicable recommendations.

Unnecessary supplies and equipment should be kept out of the print room. Grease, kerosene, or other chemicals that might impart a flavor or odor to the butter should be stored elsewhere.

Product Storage

Item B50–Room Construction - Tempering (58.126, 58.311).

Use this item to cover inspection of any room(s) used to temper cold butter to proper uniform temperature prior to packaging. Storage facilities for bulk butter prior to printing should be covered by Item B51–Room Construction - Cooler(s) or Item B52–Room Construction - Freezer(s).

The floor, walls and ceiling shall be so constructed as to permit thorough cleaning (rough or porous construction materials, such as unsealed foam type insulation does not meet this requirement). In general, tempering rooms and coolers should have sloped floors and drains to simplify floor cleaning. However, floor drains need not be provided if the floor is sloped to drain to an exit or if floor cleaning is accomplished with scrubbing machines that vacuum up the cleaning water afterward. Inspect the floor for condition and cleanliness. Check any floor drains for proper trapping.

Inspect the room to determine if it is clean and reasonably dry. Check doors, jambs, and lower wall areas for damage from pallets or forklifts. Describe any deficiencies with respect to condition or sanitation and make appropriate recommendations.

The butter should be tempered prior to printing under controlled temperature conditions for sufficient length of time to obtain a uniform temperature throughout the butter. Room capacity shall be sufficient to handle normal production and permit good housekeeping and storage practices. The temperature shall be under control to achieve satisfactory butter tempering. Tempering on a loading dock where the doors are occasionally opened is not a satisfactory practice.

Note:

> There is no objection to two-stage butter tempering by which frozen bulk butter is initially warmed for 2-4 days in a room at 65 to 80° F and is then moved to a room at approximately 50° F for second stage final tempering. Alternatively, two-stage tempering can be conducted in the same room by adjusting the temperature.

Of course, tempering facilities are not needed when butter is packaged soft from the churn, nor would they be necessary for small hard butter packaging operations where butter is satisfactorily tempered in the plant cooler room. In these cases show NA in the satisfactory column.

Item B51–Room Construction - Cooler(s) (58.126, 58.154, 58.311, 58.343).

See the guidelines for Item B50–Room Construction - Tempering.

Butter manufacturing plants should have butter cooler facilities on the premises, including those plants that have a usual practice of loading packaged butter from the churn directly into a refrigerated truck or rail car. The in-plant facilities are needed to afford proper butter storage in the event of transportation equipment delays due to weather, breakdowns, or availability. The lack of a butter cooler is unsatisfactory.

When butter is loaded directly onto a truck or rail car, check for proper refrigeration, that the doorway is adequately protected, and that boxes are not stacked too high causing them to bulge. If such deficiencies are noted, recommend correction.

Item B52–Room Construction - Freezer(s) (58.126, 58.311, 58.344).

See the guidelines for Item B50–Room Construction - Tempering.

Inspect the cooler or freezer as may be employed for temporary storage of packaged or canned butter before shipment. Butter intended to be held more than 30 days should be placed in a freezer room at 0° F or lower, with adequate air circulation, when possible after packaging.

Floor drains are not required in freezer space as they may pose serious problems with freezing and breakage. It is also relevant that frequent cleaning is not required under sub-freezing room conditions.

Use of pallets or floor racks is optional for storage of butter in freezer space.

Refrain from recommending frequency of defrosting, etc., as maintenance of refrigeration equipment and correct room temperature is management responsibility. However, check that provision is made for protection of the butter from drippage during any defrosting operations. In all other respects, inspect freezer space under the same general guidelines as for butter coolers.

Item B53–Room Construction - Warehouse (58.126, 58.153, 58.241d).

The floor of the warehouse should be of concrete or equally impervious material. A wood floor is satisfactory only when the flooring is sound, tightly laid, good condition, and maintained free of insect infestation. Inspect such floors carefully and make appropriate comments about condition.

Check that the walls and ceiling are tight and well maintained. Windows and doors shall fit tightly to exclude pests, and if left open, shall be screened. Ventilation openings into building shall be screened. Presence of birds or bird nests is unsatisfactory (use Item B64–Pest Control to describe deficiencies in the pest control program).

Item B54–Lighting & Ventilation (58.126e1, 58.343, 58.344).

Lighting shall be at least 5 F/C intensity in tempering rooms, coolers, freezers, and warehouses. Lighting fixtures shall be protected types or unbreakable bulbs here contamination of product by broken glass is possible.

Check that adequate air circulation, temperature control, and humidity control is maintained in the tempering room or cooler to prevent mold or condensation problems. If mold is noted, this item is unsatisfactory. Recommend removal of the mold, together with correction of the sanitation or humidity conditions that caused the problem.

Moldy conditions usually result in the INELIGIBLE plant status (category A). However, this deficiency can be assigned to category E if moldy areas are limited and management has the mold scrubbed off immediately during the survey. In such an instance, report the management corrective action following the applicable recommendation.

Example:

B54. – Clean the mold from the ceiling and walls in the North West corner of butter cooler #2. (The area was cleaned satisfactorily during the survey. Mr. Jones also advised that an additional fan will be installed within two weeks.) (E)

Item B55–Temperature Control (58.126d, 58.126e, 58.311, 58.343, 58.344).

The temperature of the coolers shall not be more than 40° F and the temperature of the freezers should be less than 0° F. If the coolers are more than 40° F, this item is unsatisfactory, show the temperature on the survey report. (Do not check the temperature during or just after load-in or load-out operations as such activities may allow a significant temperature rise that is not representative of normal storage conditions.) The 40° F maximum temperature requirement would not apply when the room is used for the tempering of butter prior to packaging at the same plant. When so employed, the room becomes a tempering room and the storage cooler temperature requirements are not applicable.

Forced air type refrigeration units have cold surfaces that will condense moisture vapors from the air. Catch trays or pans are necessary to prevent the condensate from dripping on stored products. Such collection pans also require piping to send the condensate to a floor drain located either inside or outside the cooler room (piping the condensate into a floor drain, above the trap, prevents it from running across the floor where moisture can be picked up by room air and contribute to undesirable high humidity conditions).

If the condensate is optionally piped directly into a sanitary sewer line or vent pipe, a trap is required in the condensate line to prevent sewer odors or air from gaining admittance to the cooler room. The trap can be a U-type bend in the line, or a P-type or S-type trap. Location of the traps is not a critical matter; the preferred location is directly under the collection pan.

However, when a common header pipe collects condensate from several refrigeration trays, one trap in the common header pipe downstream from the last tray is satisfactory.

When the condensate line is directly connected into a storm sewer pipe or vent, check for above-mentioned U-type traps in the same manner as outlined for hookups to sanitary sewers. This is to prevent backup of air from such pipe systems into the cooler room. Such reverse air flow might occur, for instance, when heavy rainfall or other surface drainage displaces air volume in the storm sewer piping.

Some older coolers may still have cooling systems employing refrigerant pipes along the walls or on ceiling areas. Although rapidly becoming obsolete, such systems are satisfactory if 1) adequate temperature and humidity control is maintained, 2) stored product is safeguarded during defrosting, and 3) adjacent wall or ceiling areas are kept clean and in good condition. If deficiencies are noted in these regards, recommend correction of the deficiencies or provision of a better refrigeration system.

Item B56–Housekeeping (58.126e, 58.146d, 58.154, 58.343, 58.344).

See the guidelines for Item A7–Housekeeping.

All products in tempering rooms, coolers, and warehouses should be stored on pallets, floor racks, etc. The pallets and racks should be maintained in good condition to prevent damage to product and containers. Products that may contribute to off-odors or in any manner contaminate the butter shall not be stored in the same room, and this should be noted on the report.

Clear space for access around the perimeter of the coolers and tempering rooms is not required since butter is kept in these rooms only for limited periods. This affords opportunity for access for cleaning, maintenance, and pest control activities. After a cooler area or bay is cleared, it shall be inspected and cleaned if necessary before reuse.

Inspect the condition of filled bulk butter cartons in storage. If boxes are generally misshapen, damaged or excessively bulged, describe the conditions on the report. Often the cause of this condition is due to stacking the butter before it firms up or stacking containers too high. When this is found, make appropriate recommendation for correction.

General Items

See the guidelines for Page A – General Items

Page C. Inspection of Cheese Making Operations. (Form DA - 151 - 3)

Milk Processing

Item C1—Room Construction (58.126, 58.407).

See the guidelines for Item A1—Room Construction.

Give special attention to overhead construction conditions which could lead to direct contamination of the milk or cheese in open vats or hoops. Check for dirty overhead fans or louvers, open cracks in the ceiling, roof leak evidence, peeling paint and condensate drippage. When such deficiencies are noted, which could allow direct contamination of the product, make applicable recommendations and stress the importance of prompt correction.

Item C2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item C3—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item C4—Clarifier or Separator (58.128a, e).

See the guidelines for Item B4—Separator.

Inspection of clarifiers is basically the same as for separators. The sludge from self-cleaning clarifiers and separators is sometimes flushed away with water into the plant's floor drain system. At other plants, the sludge may be stored separately for disposal with plant garbage or for animal feed. In such instances, check that the sludge is handled in clean, covered containers in a satisfactory manner prior to disposal. In no case shall the sludge from clarifiers be directed back into edible product.

Item C5—HTST sealed _____ at _____ sec. _____° F (58.128, 58.438, 58.439).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec. _____° F.

Some cheeses are made from raw or heat-treated milk. However, when the plant produces any cheese that is required to be made from pasteurized milk by a standard of identity, or any cheese that is marked as pasteurized, the HTST pasteurizer shall comply with the *3-A Accepted Practices for the Sanitary Construction, Installation, Testing, and Operation of High—Temperature Short—Time Pasteurizers, Number 603-* . If the proper controls and equipment are not present to comply with the 3-A Accepted Practices, show a recommendation on the report such as:

C5. — "If the cheese is to be marked, 'Made from Pasteurized Milk', equipment and controls shall be installed to meet the 3-A Accepted Practices for HTST Pasteurizers, Number 603- . This survey shows that {fill in names of items that are lacking} are needed." (A*****)

***** See paragraphs below for the proper category assignment

If pasteurization is required, or intended, the cheese milk shall be pasteurized at 161° F for not less than 15 seconds unless fortified to above 10% butterfat or 18% total solids, which requires a minimum of 166° F for not less than 15 seconds.

The following guidelines apply for pasteurization deficiencies noted during the survey:

A. Cheeses Defined as Made From Pasteurized Milk by an FDA Standard of Identity.

Whether or not the finished cheese is labeled as pasteurized, the plant shall utilize approved, properly engineered, and sealed pasteurization equipment for all dairy ingredients. Otherwise this shall be considered a category A deficiency (applies to Cottage, Neufchatel, Cream, Monterey or Monterey Jack, High Moisture Jack, Muenster, and all types of Mozzarella and Scamorza). Some plants may be using the phosphatase test to determine pasteurization instead of using properly engineered pasteurization equipment. This is not a recommended practice and is not acceptable at USDA approved plants. USDA approved plants that make these cheeses shall have properly engineered pasteurizers.

B. Uncured Soft Cheeses Which are Usually Consumed Fresh and for Which There is no FDA Standard of Identity.

Same policy as outlined in paragraph A above (applies to Bakers and Farmers cheeses).

C. American Type Cheese.

The procedure for preparing the survey report and assigning deficiencies to categories shall be as follows:

1. When a plant is marking any of its production of cheese as “Pasteurized” and the survey shows that proper equipment and controls are installed and sealed, the inspector shall check this item satisfactory and show the required information about HTST time, temperature, etc.

2. When a plant is marking any of its production of cheese as “Pasteurized” and proper controls or equipment are not present, show a recommendation for provision of a properly engineered pasteurizer system. This shall be considered a category A deficiency.

3. When a plant is marking any of its production of cheese as “Pasteurized” and raw dairy ingredients (such as whey cream) are added after the pasteurizer, recommend that all dairy ingredients be pasteurized. This shall be considered a category A deficiency.

4. When a plant is not marking the cheese as “Pasteurized” and is heat-treating the milk, mark this item NA and show the temperature and holding time in Item C7—Heat-Treating at __ sec, __° F. Also, check the finished product for proper labeling as outlined in Item C54.

   In some instances, a plant might be manufacturing American type cheese from both pasteurized and heat-treated milk, and management may wish to use the same HTST unit for processing the milk. In such case, the pasteurizer shall comply with the 3-A Accepted Practices for HTST Pasteurizers and shall have a dual diversion control system (as outlined in Item B6), with one of the divert settings to be at least 161° F and the other at a heat-treatment setting chosen by management, such as 147° F.

Although this section concerns American type cheese (Cheddar, Washed Curd, Colby, Granular) it also applies to the following cheeses which, by FDA definition, may also be made from either pasteurized or unpasteurized milk: Asiago, Blue, Brick, Caciocavallo, Edam, Gouda, Gorgonzola, Hard cheeses, Grating cheeses, Gruyere, Limburger, Nuworld, Parmesan, Provolone, Soft Ripened cheeses, Romano, Roquefort, Samsoe, Sap Sago, Semisoft cheeses, Semisoft Part-Skim cheeses, Spiced cheeses, and Swiss.

There are separate FDA standards of identity for Cheddar Cheese for manufacturing, Washed Curd Cheese for manufacturing, Colby Cheese for manufacturing, Granular Cheese for manufacturing, and Brick Cheese for manufacturing. Such cheese must conform to the respective standards for Cheddar, Washed Curd, Colby and Granular cheese, except that the milk is not pasteurized and curing is not required. This type of cheese is intended for processing or other manufacturing purposes which involve high heat treatments during the processing. Since by definition, the milk for cheese making is not pasteurized, do not criticize lack of a timed and sealed pasteurizer if the plant uses the option of heat-treating the milk. If

the plant is making one of these types of cheese "for manufacturing," mark this item NA and use Items C6—Heat-Treating or HTST Equipment and C7—Heat-Treating at _ sec, __ ° F to cover the situation.

D. Other cheeses.

Pasteurization in "3-A" equipment of the fluid product for making some cheeses is not required for plant approval because of high temperatures employed in the manufacturing methods for the cheese.

FDA Standards of Identity for Cook cheese (Koch kaese) and Gammelost specify how the cheese curd is heated to high temperatures during the manufacturing process (at least 180° F for Cook cheese and about 145° F for not less than ½ hour for Gammelost). Pasteurization of the fluid skim milk mixture is not required prior to start of cheese making. The standard of identity for Cook cheese shows a phosphatase test requirement, but this can be satisfied by the curd cooking treatment. Ricotta cheese (no FDA Standard of Identity) is also made by a manufacturing procedure which involves high heat and acid precipitation of proteins from whey or whey-milk mixtures. Temperatures of 170-200° F for 5-20 minutes are employed. Initial pasteurization of the dairy ingredients is not required even though the Ricotta cheese is sold fresh for consumption without curing.

If any of the cheeses in this category are labeled as "pasteurized," and the fluid product from which the cheese is made is not pasteurized with legally sealed equipment, the inspector shall show a recommendation for provision of a properly engineered and sealed pasteurizer system (use the same wording as the example above). This shall be considered a category C deficiency.

E. Condensed Milk for Cheese Making.

Pasteurization at a minimum temperature of 161° F for at least 15 seconds or its equivalent, using legally sealed pasteurization equipment is required prior to the evaporator. This pasteurization step is required even if the cheese is labeled as made from raw milk.

If the condensed milk is received from another plant it shall be repasteurized or the cheese shall be labeled as "heat-treated," "unpasteurized," "raw milk," or "for manufacturing" (see Item C54 for labeling requirements of raw milk or heat-treated milk cheese). The condensed product shall be pasteurized, separately or by blending the reconstituted product with fresh milk in the constant level tank of the HTST, at a minimum of 161° F for a minimum of 15 seconds. However, a pasteurization temperature of 166° F for a minimum of 15 seconds is required if the total solids of the product is greater than 18%.

F. Reconstituting NDM for Fortifying Milk for Cheese Making.

The FDA Standards of Identity for Cheddar and many other types of cheese allow addition to the milk of "cream, skim milk, concentrated skim milk, nonfat dry milk, and water in a quantity sufficient to reconstitute any concentrated skim milk or nonfat dry milk used."

Note:

> Dry whey and WPC are not allowed in most cheeses which have a standard of identity (except as noted in the guidelines for starter media in Item C14—Media Storage & Reconstitution).

If water is used to reconstitute the NDM, it must be potable, filtered, and the resulting reconstituted milk must be pasteurized except as noted in paragraph D above. This pasteurization step is required even if the cheese is labeled as made from raw milk. The plant may blend the pasteurized, reconstituted milk with other heat-treated milk to produce raw milk cheese (see Item C54 for labeling requirements of raw milk or heat-treated milk cheese). Pasteurization requirements are the same as outlined in paragraph E above.

If milk is used to reconstitute the NDM, the resulting cheese milk is considered a raw product, even if pasteurized milk is used. If the plant is reconstituting the NDM without subsequent pasteurization (to avoid an excessive number of heat-treatments) the cheese shall comply with the labeling requirements of raw milk cheese as outlined in Item C54. Pasteurization requirements are the same as outlined in paragraph E above.

Also check the following items:

1. A dump hopper and adequate dust control must be present. A powder funnel and effective dust control would meet the minimum requirements (use blank Item C11 to list any deficiencies).

2. The NDM shall be reconstituted in a processing area or its equivalent. If the dumping is done in the raw milk receiving area recommend a reduction in status unless this practice is discontinued immediately (use blank Item C11 to list this deficiency).

3. The funnel (if used) and associated piping may not be attached directly to the cheese vat. If you observe this make an appropriate comment under Item C23—Make Vats & Agitators and recommend a reduction in status unless the plant makes the required corrections during the survey.

4. If large bulk bags (Super Saks, Jumbo Bags, etc.) are used, follow the guidelines for Item D45—Tote to Bag Packaging.

G. Standardizing Cheese Milk With Whey Cream.

Whey cream can be used to standardize the cheese milk, in the plant where it was produced, provided it is properly handled and the process is inspected by the USDA (Page W is required).

The whey cream should be pasteurized, either in separate equipment at a minimum of 166° F for not less than 15 seconds, or by addition to the cheese milk in the constant level tank of the HTST. If the whey cream is added to the balance tank, the mixture can be pasteurized at a minimum of 161° F for not less than 15 seconds. However, a pasteurization temperature of 166° F for a minimum of 15 seconds is required if the fat content is above 10% or the total solids is greater than 18%.

When the whey cream is not pasteurized, the cheese shall be labeled as “raw milk cheese” or “cheese for manufacturing” (see the guidelines for Item C54 for labeling requirements).

Item C6—Heat-Treating or HTST Equipment (58.128).

See the guidelines for Item B6—HTST or Vat Pasteurizer.

If the milk for cheese making is either heat-treated or pasteurized, cross out the nonapplicable part of the heading on the report to properly indicate the kind of equipment being inspected. Use this item to make any recommendations needed with respect to sanitation or condition of the equipment.

Example:

C6 ~~Heat-Treating or~~ HTST Equipment
or
C6 Heat-Treating ~~or HTST~~ Equipment

When raw milk cheese is made, show NA for this item and also Item C5—HTST Sealed ___ at ___ sec, ___ ° F and use Item C7—Heat-Treated at ___ sec, ___ ° F to cover inspection of the preheater used for adjusting the milk to setting temperature.

Item C7—Heat-Treating at _____ seconds _____° F (58.128, 58.439).

When the milk for cheese making is only heat-treated, show the temperature and hold time directly in the item heading.

When only heat-treating is intended, it is not required that the equipment be timed and sealed. When only heat-treating is practiced, check this item satisfactory even though essential pasteurizing components may be missing (see the guidelines for Item C54 for labeling requirements).

Also, there is no legal minimum temperature and holding time for heat-treated milk for cheese making. However, the FDA requires that when the whey is intended for making Grade A Dry Whey, heat-treating of the milk for cheese making (in lieu of pasteurization) must be at a temperature of at least 147° F for at least 21 seconds, 153° F for at least 15 seconds, or other acceptable equivalent time-temperature relationship, using "3-A" equipment. The intent of this minimum heat-treatment is to reduce the number of staphylococci so that development of enterotoxin is less likely during the cheese make procedure and prior to the pasteurization of the whey. Of course, the Grade A inspection agencies will have the responsibility to check for compliance with these heat-treatment and equipment requirements at plants making whey or whey products for Grade A use. If such plants also have USDA inspection, simply report hold time and temperature actually used in the same manner as for any other heat-treating cheese plant.

Item C8—Vacuumizer (58.128p).

See the guidelines for Item B7—Vacuumizer.

Item C9—Storage Tanks (58.128d, 58.143).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

Item C10—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Starter Facilities

Item C12—Room Construction (58.126, 58.406).

See the guidelines for Item A1—Room Construction.

The wording of §58.406 permits either, 1) a separate starter room or, 2) "properly designed starter tanks and satisfactory air movement techniques." Although a separate starter room is desirable, it is not required when specially designed bulk starter tanks are used. Such tanks usually have enclosed dome tops, high efficiency filtration of air admitted to the tank, and are mechanically cleaned. Although a separate starter room is not required, starter making is still considered a processing activity. Therefore, the tanks must be located in a processing room or area and shall not be located near areas where contamination is likely to occur. These same requirements apply to secondary starters. In addition, starters shall not be processed in close proximity to equipment such as boilers, open type separators, whey tanks, or other probable sources of contamination.

Also check the floor, walls ceiling and lighting in the room or area. Make recommendations as may be necessary. Floor drains are not required if the floor is sloped to drain to an exit.

If the plant is using "direct set" starter, show NA for Items C12-18 because special starter facilities are not needed. In such case, show the heading "Direct set starter use" for blank item C19. Check the item satisfactory if the plant is thawing the cans of concentrated culture and drying the can exterior in a sanitary manner before adding the contents to the vat (it is not necessary to check plant facilities for storage and thawing of the cans of starter).

Item C13—Lighting & Ventilation (58.126d, 58.406).

See the guidelines for Item A2—Lighting & Ventilation.

The manager should be encouraged to provide a filtered air supply to the starter room. The air should be obtained from an outside source and thereby provide a positive pressure in the room to minimize the possibility of contamination. Air filters for ventilation of starter rooms should have a minimum average efficiency of 90% when tested by the ASHRAE Synthetic Dust Arrestance test (same efficiency as required for spray dryers for air to be heated). This is intended as a guide for management regarding a minimum efficiency for such filters. It is, of course, optional if more efficient filters are chosen. Since this is a "should" item, it will not be necessary to ascertain efficiency of existing filters or to report such information on the report.

Item C14—Media Storage & Reconstitution (58.126e, 58.128).

Many plants use special dry bulk starter preparations to make up bulk starter. It is not necessary for bulk starter media to be manufactured in a USDA approved plant. All other dairy ingredients in the cheese that are allowed by a standard of identity shall be from approved sources.

Check for orderly storage of bags of starter media up off the floor on racks or pallets. When considerable amounts of starter are made, a separate room should be recommended for storing a small supply of media and for performing the dumping and reconstitution operations.

Inspect the equipment used for reconstitution (usually a funnel and recirculating pump). If a Ladish Company “Tri-Blender” is used, check that the valve between the funnel and pump is an approved 3-A sanitary type. They are sometimes supplied for food uses with a series 55 butterfly type valve that does not conform to 3-A requirements. If so, recommend replacement. If possible during the survey, also check that bag dumping is carried out in a sanitary manner.

Misuse of starter media in the cheese making process is a serious problem. This involves the use of excessive amounts of starter media, the inappropriate addition of secondary starters, or the addition of dry starter media for the fortification of milk for cheese making. Secondary starters, when used in appropriate amounts should not be criticized In cheese making, active starter culture is generally added to milk at the rate of 1-2%. Consider amounts of 3% or more added starter (including secondary starter, if used) as excessive. When observed usage is greater than 3% recommend discontinuing the improper use of starter to fortify the cheese (category A deficiency).

Whether using commercial starter media or plant blended whey fractions, the starter culture shall be viable. If the starter does not contain an active culture, it is being used to fortify the cheese milk. However, only the optional ingredients listed in the Standard of Identity can be used to fortify the cheese milk. Therefore, secondary starter that contains whey fractions cannot be heat-treated just before being added to the vats. If the starter is being misused in this manner, notify the National Field Office and assign the INELIGIBLE status (category A deficiency).

The use of secondary starters is acceptable, provided they are used according to all the above guidelines. In summary:

1. Less than 3% total starter is used.

2. Appropriate temperatures are used.

3. Handled as a starter (i.e., made in the starter room or specially designed starter tanks).

4. Appropriate powder handling equipment is used for reconstituting the secondary starter media.

Item C15—Media Heat-Treating Equipment (158.128j, k).

See the guidelines for Items A27—Product Cooler and B6—HTST or Vat Pasteurizer. Show NA for this Item (use Item C16) if the plant performs the heat-treating in the starter making vats, which is a common practice in small or medium sized operations.

Use this item to cover inspection of equipment used for continuous heat-treating of bulk starter media prior to piping to starter vats for inoculation. Such equipment usually consists of heat exchangers to bring the temperature to 200-250° F, a hold tube, and regenerative cooler. Because of the high temperatures used, pasteurization is not required (timing and sealing of the unit and other public health controls are optional). However, the equipment shall meet the applicable 3-A Sanitary Standards.

Item C16—Processing Vats (58.415).

Inspect the processing vats for condition and cleanliness giving particular attention to appurtenances, such as vents, agitator, valve outlet, etc. Also, check that the vats are made of stainless steel, in good repair, equipped with tight fitting lids and have adequate temperature controls such as valves, indicating thermometers, and recording thermometers.

§58.415 requires that, "New or replacement vats shall be constructed according to the applicable 3-A Sanitary Standards" (formerly a "should" item). There is no special 3-A Sanitary Standard that pertains only to starter vats. However, there are two 3-A Sanitary Standards which are applicable to commonly used processes of starter making:

1. When the bulk starter media is mixed, heat-treated or pasteurized, set, incubated, and cooled in the same vat, *3-A Sanitary Standards for Non-Coil Type Batch Pasteurizers, Number 24-* is applicable (this process is likely to be encountered at only small or medium size cheese operations).

2. When the bulk starter media is heat-treated with continuous type heating equipment and is then piped to a vat for subsequent inoculation and incubation, *3-A Sanitary Standards for Non-Coil Type Batch Processors for Milk and Milk Products, Number 25-* is applicable for the vat (this process is most popular at medium or large size cheese operations).

If inspection of new or replacement vats reveals no 3-A symbol, handle in the same manner as outlined for Item A3—Pumps, Pipelines, & Valves.

Show NA for this item if the starter is made in cans, which is a satisfactory option.

Item C17—Starter Cans or Pipelines (58.128a, 58.131a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves or Item A5—Condition of Producer Cans.

The handling, cooling, and storage of starter in stainless steel or well tinned clean milk cans is a satisfactory practice. Check several empty cans, if available, using the inspection guidelines for Item A5—Condition of Producer Cans. When more than 10 percent are in an unsatisfactory condition, show a recommendation for correction and a summary of the inspection results.

If starter is made in cans, check that the cooking and cooling tank is maintained in a clean condition. Also, check the pails, utensils, etc. for cleanup and condition.

When starter is conveyed to vats with pipelines, inspect the pump, pipelines, valves, and fittings and use this item to report any deficiencies.

Item C18—Housekeeping (58.126e, 58,127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese Room

Item C20—Room Construction (58.126, 58.407).

See the guidelines for Item A1—Room Construction.

Also check that the room is of adequate size and the equipment spaced to permit movement around the equipment for proper cleaning and satisfactory working conditions.

Item C21—Lighting & Ventilation (58.126d, 58.407).

See the guidelines for Item A2—Lighting & Ventilation.

Filtered air ventilation should be encouraged for make rooms, but it is not mandatory if ventilation is otherwise adequate (a “should” item of §58.407).

Item C22—Pumps, Pipelines & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item C23—Make Vats & Agitators (58.128, 58.416, 58.417).

A. Conventional Open Cheese Vats and Tables (58.416, 58.417).

Open cheese vats and tables shall meet the requirements of the 3-A Sanitary Standards for Cottage Cheese Vats, Number 38- .

Carefully inspect the condition and sanitation of the vat liner. The vat bottom should be relatively smooth and allow free drainage of the whey to the outlet valve. Check cleaning of the outlet valve and sump. Outlet valves shall be of a sanitary type. Outlet valves with bevel seats should be removed daily for hand cleaning.

Examine around the outlet valve and the top corners of the vat liner for cracks. Small cracks in the top of a drain table or vat should be assigned to category C. However, cracks in a jacketed vat that might allow heating media into the cheese should be assigned to category B.

Agitators shall be of the closed type which are so designed as to protect the product in the vat from potential contamination from the moving parts in the agitator assembly.

Check that exterior surfaces of agitators are kept clean and that exposed interior surfaces are cleaned as necessary to keep them relatively free from accumulated rust, dirt, etc. §58.417 requires that “all product contact surfaces, shields, shafts, and hubs shall be constructed of stainless steel or other equally corrosion-resistant metal.”

Do not recommend replacement of painted metal shields with stainless steel shields when they are located on open rail type agitators. Instead, recommend remodeling or replacement of the entire unit.

Iron agitator hubs and shafts are unsatisfactory, recommend replacement with stainless steel. Aluminum hubs in good condition should not be criticized. However, they should be carefully checked as they are often found broken or in excessively worn condition. Agitator hubs shall not be painted. When painted hubs are noted, recommend removal of the paint.

When oil seepage is noted on the agitator shaft, recommend correction (usually requires a new oil seal or perhaps new bearings and an oil seal). Assign this deficiency to category B. If the oil is noted in the product assign this deficiency to category A.

B. Enclosed Cheese Vats and Tables (58.416).

Enclosed cheese vats and tables, installed after November 16, 2003, shall meet the requirements of the 3-A Sanitary Standards for Enclosed Cheese Vats and Tables, Number 83- .

These vats are either round and have one or more vertically mounted agitators (such as the Double O vats), or may have one or more horizontal agitators (such as the OST vats),. The agitators usually also perform the function of cutting the curd. After the curd is cooked, whey may be predrawn and then the remaining curd and whey slurry is usually pumped to drain tables for subsequent manufacturing steps. Cleaning is usually accomplished by means of factory installed devices for mechanical cleaning in place.

Spray devices, for the addition of nondairy ingredients intended to remain in place during processing operations, if provided, shall be designed, such that their exposed exterior surfaces inside the vat meet product contact surface requirements and are readily accessible, readily removable and inspectable. Interior surfaces of pipelines and spray devices supplying nondairy ingredients are not required to meet product contact surface finish requirements except when included in a mechanical cleaning circuit for product contact surfaces. Also, there are no minimum radii requirements for orifices in spray devices used for incorporating non-dairy ingredients or potable water.

As with conventional vats, inspect all interior surfaces and appurtenances for condition and cleanliness. This may require entering the vat. Before doing so, arrange with management for making sure that the unit cannot be started while you are inside (use the lock out/ tag out device supplied by the National Field Office) and check the plants confined space entry program (see Section I, Item P).

The Damrow “Double O” enclosed cheese vat has been widely used in the cheese industry for many years. Following are areas which require close inspection during plant surveys.

1. The points which are the indentation of the figure ”8“ shape of the interior of the vat are high stress points for the stainless steel of the bottom. Check these areas for stress cracks.

2. The bottom discharge depression is also subject to stress cracking.

3. Check for product remnants on the knife assembly (including the underside), knife bearing assembly and the discharge valves.

4. Check for stress-cracks on the exterior of vat near the outlet valve.

5. Look for metal to metal contact that can occur if the agitator shaft is not properly aligned.

6. Check the areas on the upper surfaces where the agitator braces are attached.

When inspecting enclosed horizontal cheese vats, such as the HCV or OST cheese vats, inspect all interior surfaces and appurtenances for condition and cleanliness. Because of the arrangement of the agitator(s) in this type of vat it is not safe to enter. The rear seal (drive end) of the agitators in these vats are supplied with a CIP line. The front seal rides in a plastic bushing. Inspect at least one set of bushings each survey. Inspecting the front bushing will require the agitator to be supported by a hook while the plate on front of the vat is removed. There should be enough room between the drive motor and the vat to slide the rear bushing out enough to inspect it.

C. Miscellaneous.

During cheddar cheese making operations, you may note the addition of calcium chloride, artificial color, hydrogen peroxide solution, catalase preparation, and special curing enzymes in addition to the normally employed starter, rennet (or other milk clotting enzyme), and salt. All of these materials are permitted by the *FDA Standard of Identity*, which also outlines applicable limitations, labeling requirements etc.

When special enzymes are added to aid in curing or flavor development of Cheddar cheese, no special labeling is required for the finished cheese when the enzymes are added early in the making process, before the curd is formed. However if the enzyme preparation is added directly to the curd or cheese, the finished cheese must be specially labeled, for instance, “Enzyme Modified Cheddar Cheese.”

For some varieties of cheese (Asiago, Blue, Gorgonzola, Parmesan, Reggiano, Provolone, Romano, Swiss, and Emmentaler) the FDA Standards of Identity allow the bleaching of the milk with benzoyl peroxide or a mixture of benzoyl peroxide with potassium, calcium sulfate, and magnesium carbonate.

It is not the intent here to outline the wide variety of permitted ingredients and making procedures for standardized cheeses. Evaluation of plant practice in this regard requires a thorough knowledge of the standards. Checking for proper use of these materials would also

take considerable time, so this is not a USDA survey responsibility. Nevertheless, if you should note apparent improper use, either recommend correction or ask for supervisory guidance when you need assistance.

Item C24—Drain Tables (58.128, 58.416, 58.417).

See the guidelines for Item C23—Make Vats & Agitators.

In general, the construction and inspection guidance for conventional open cheese vats also applies to drain tables. Many drain tables, however, are equipped with special mechanical devices for pushing the curd and with special end designs for feeding the curd to bulk cheese conveying systems. Inspect such mechanical equipment carefully for cracks, poor condition gaskets, sanitation, etc.

Most drain tables have a center drain trough, covered by perforated or slotted drain plates. Remove some of the drain plates for inspection of condition (criticize cracks, rough welds, etc.) and cleanup. Also check the vertical trough outlet pipes as these are sometimes overlooked during cleanup.

Some drain tables (Damrow) have end gates which are gasketed with transparent tygon hose slipped over a formed stainless steel rod and held in place with a hose clamp. If the hose is cracked, or cut, or contains liquid, recommend replacement of the hose and use of end fittings which do not leak (a redesigned gasket is available that utilizes a solid gasket in place of the hose).

Make vats and drain tables should be washed between makes (cleanup between makes need not be as thorough as would be expected at the end of the day's operation).

Item C25—Curd Knives, Forks, Rakes, Misc. (58.128, 58.417, 58.419).

Cutting the cheese into uniform size cubes is important for proper cooking, salting, and composition control. Inspect the curd knives for cleanliness and missing wires. Show as unsatisfactory when wires are missing, or broken (more than two vertical or two horizontal). Also make a recommendation if the wires are excessively loose. Check for satisfactory storage of knives when not in use.

Inspect the forks, rakes, and miscellaneous utensils for cleanliness and condition. These items shall be made of stainless steel or plastic material that meets the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* . Recommend repair or replacement if these items are in poor repair, have cracks, crevices, rough welds, or cannot be cleaned properly. Remove the rubber from the stainless mounting on the squeegee and check for cleanliness. This should be removed daily for proper cleaning. Wood rakes or handles are not acceptable. Also check for satisfactory storage of utensils when not in use.

Some strainers, although constructed of stainless steel, are fabricated with crimped joints. When such strainers are noted in poor condition, recommend replacement with new strainers having seamless construction.

Item C26—Mech. Draining, Matting Equipment (58.128, 58.418a, b).

Show NA for this item if the plant uses conventional vats or vats and drain tables.

If the plant uses special automatic or semiautomatic cheddaring equipment, inspect product contact surfaces for condition and sanitation.

The USDA, Dairy accepted design of the Damrow DMC Machine provides openings for the shafts supporting the belt to pass through the sides of the machine. These openings permit the bearings (both grease and Teflon type) to be located outside of the product contact area and therefore eliminate the possibility of contamination from these bearings.

While the DMC machine is being CIP cleaned, a sizeable amount of cleaning solution can be lost through these openings. To salvage this solution, pans have been installed below the openings to catch the CIP solution and return it to the DMC machine for recirculation. This is an acceptable practice.

During the cheddaring process, a small amount of whey is lost through these same openings. The piping which attaches the catch pans to the machine for CIP solution return shall be disconnected during operation. Whey that is collected in these pans during operation has been in contact with unsanitary areas and shall not be salvaged for human consumption in USDA approved plants.

If the cheese manufacturing plant is salvaging this whey, inform the plant management that this is an unsatisfactory practice. If plant management elects to immediately disconnect this piping during the survey, lower the plant status to ensure the practice is being discontinued. If plant management either cannot or chooses not to disconnect the piping during the survey, assign the INELIGIBLE status to all codes which include whey.

Item C27—Curd Mill (58.419).

Product contact surfaces of the curd mill shall be made of stainless steel or be well tinned. Check that the motor and drive mechanism are mounted or guarded to prevent dirt or grease from dropping into the vat. Also check that there is no metal-to-metal rubbing of parts which might shave off metal particles into the cheese. Old style mills with bolted blades and exposed threads should be replaced with welded assemblies.

Use care during inspection as mills have many sharp edges.

Most mills for Cheddar Cheese are the rotary type, but Mozzarella “milling” is often accomplished with dicer type units using a reciprocal plunger to force the curd through sturdy

knives. On such units, inspect all product contact parts for cleanliness and condition, including the hopper, chamber, plunger, and knives.

Item C28—Mixing & Molding Equipment (58.428).

When the plant makes Mozzarella cheese, use this item for listing deficiencies with the cheese mixing, molding, and cooling operations.

A. Mixing Equipment.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Cheese Cookers, Number 70-* .

Modern mixers for the cheese and hot water usually employ one or more augers to continuously mix and convey the cheese from a mill or dicer to the molding machine. Some older mechanical mixers are batch type, however, and use paddles or arms to mix the cheese and hot water in a portable kettle. Either type is satisfactory. Inspect all parts for condition and sanitation. Augers should be removable for cleaning, or design provision should be made for easy effective daily cleaning of all product contact surfaces, including seals or bearings located in the product zone.

The 3-A Sanitary Standard allows certain surfaces to be coated with Teflon or shot peened to prevent the cheese from sticking. When surfaces are coated with Teflon, check for adherence. Recommend recoating when the Teflon is peeling or deteriorated. When surfaces are shot peened, they will be slightly rougher than a number 4 finish.

Steam introduced for direct injection heating of the water shall be culinary and meet the requirements as outlined in the guidelines Item A36—Culinary Steam.

Inspect the hot water tank, pump, related piping system and temporary storage tank for the hot water-fat mixture, which is usually separated to recover the butterfat.

There is no objection to the reclaiming of milkfat, milk solids, or brine fractions of the cooker/stretcher water provided the component streams are handled in a sanitary manner and in properly designed and constructed equipment.

Note:

> For the purpose of this section of the guidelines the brine fraction is the excess salt extracted from the cooker/stretcher water. This should not be confused with brine systems used later in the process to cool and salt the cheese.

Any milkfat reclaimed will be considered whey cream, and any milk solids reclaimed will be considered as whey or salty whey suitable for intermixing with other human food products as appropriate.

The quality of the milkfat and milk solids reclaimed should be monitored carefully. The repetitive pumping at elevated temperatures may result in deteriorated quality. While acceptable from a sanitary standpoint, the quality may not be sufficient to produce finished products of satisfactory quality.

When inspecting systems from which the milkfat, milk solids, or brine fraction is reclaimed, the following criteria shall apply.

1. Salt slurry makeup systems shall use potable water. They shall be constructed consistent with the salt slurry systems used for the injection of salt into continuous butter churns (See the guidelines for Item B17—Churn(s)).

2. Because of the relatively small volumes of salt brine in cooker/stretchers, there is no objection to mixing this brine in with properly collected and handled salty whey prior to reclaiming the product in a membrane system. If a membrane system is used to separate the salt brine from the milk solids fraction, pasteurization is required. The pasteurizer shall be properly engineered and installed, and be timed and sealed by the state regulatory authority. For USDA acceptance, the pasteurizer may be located either before or after the membrane unit. However, the plant should be aware that the FDA generally requires that the pasteurizer be located prior to the membrane unit.

   Reclaimed brine solutions recirculated back to the cooker/stretcher shall be handled in equipment designed and constructed to product contact standards. This is required so the system can be effectively cleaned in the event a failure in the membrane system allows milk solids to be introduced into the brine recirculation system.

3. The cooker/stretcher water shall be stored at temperatures either higher than 145° F or lower than 45° F until it is processed to recover the fat, solids, or brine fractions.

4. Reclaimed milk solids (whey) shall be considered as raw and shall be pasteurized at some appropriate point during processing and before leaving the plant.

5. If the reclaimed milk solids are further processed by separation, the following shall apply:

   a. The separator shall be a sanitary design dairy separator.

   b. Milkfat (whey cream) may be added back to the raw milk balance tank prior to pasteurization for cheese making or be cooled and blended with other whey cream for shipment to another plant or used for butter making. If blended with cream, the entire blend shall be labeled as whey cream.

   c. The heavy phase (milk solids and salt) may be combined with other salty whey for further processing or disposal. See the guidelines for processing salty whey.

   d. If a self cleaning (desludging) separator is used the sludge or “shoot” material shall be disposed of as waste. This product shall not be reclaimed as human food.

6. The cooker/stretcher water shall be processed or dumped following the end of each days production. The cooker/stretcher water shall not be held over and used the following day, nor assembled for several production days before further processing in order to increase the volume to be processed.

B. Molding Equipment.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Cheese Moulders, Number 71-* .

Molders usually are Teflon coated or have shot peened surfaces to prevent the cheese from sticking. Molders consist of hopper and auger(s) for forcing the warm cheese into desired shapes and sizes. Inspect for condition and sanitation as outlined for mixers.

C. Cheese Forms, for Cooling (if used).

See the guidelines for Item C46—Hoops, forms, & Press Cloths.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Moulded Cheese Chillers, Number 72-* ,

A common commercial style for Mozzarella cheese is the five or six-pound loaf. To facilitate handling of the stainless steel loaf forms, they are sometimes fastened together, three or four to a unit, with welded stainless steel straps or bars. Check for open seams at point of welding, particularly if strip or spot type welding is employed. Since the entire form and the exposed cheese are immersed in the cooling water, open seam areas at fastening points have direct sanitary significance and are unsatisfactory. Plastic forms shall be smooth, in good condition, and free of cracks. Also, check for proper storage of the forms when not in use.

D. Cheese Cooling.

Cooling is usually accomplished by immersion of the cheese, with or without forms, into cold water or brine. The water may be flowing continuously or may be refrigerated and recirculated. If recirculated, the water should be drained at the end of the day. In addition, all surfaces that the water contacts shall be considered product contact surfaces.

Chilling of the water with immersed refrigerated copper coils should not be criticized. Copper coils shall not be used to cool brine.

Some special molding machines also have refrigerated jacket type surfaces to accomplish a dual function of molding and cooling.

Item C29—Salt Storage & Handling (58.418c).

See the guidelines for Item B19—Salt Storage & Handling.

A. Manual Salting.

Salting of American cheese at many plants will consist of manual spreading of the salt on the curd in the make vat or drain table, followed by a period of mechanical forking and mellowing prior to hooping.

Pails used to salt the cheese shall not be stored on the floor.

B. Automatic Salting.

If salting is performed by a machine, the automatic salter shall be constructed of stainless steel or other equally corrosion resistant metal and should be constructed to equally distribute the salt throughout the curd. It shall be designed to accurately weigh the amount of salt added. It shall be constructed so that it can be satisfactorily cleaned. The salting system shall provide for adequate absorption of the salt into the curd. Sometimes steam is used to moisten the curd during salting. If this is the case, the steam must comply with the guidelines for Item A36—Culinary Steam.

Inspect the automatic salting system for compliance with these requirements. Make recommendations as may be applicable.

The salting machine is often a separate unit which requires conveyors to bring the curd to it. For the manufacture of cheddar cheese, the conveyors are usually belt or vibratory type and are located just after the curd mill. Inspect such conveyors for sanitation and condition and make any needed recommendations under this item number. Also, check that suitable means of access is provided for any elevated or hard-to-reach components to facilitate daily cleaning.

In connection with automatic salting machines, the salt is sometimes 1) bulk handled in tote bins, 2) dumped into a hopper for gravity feed, or 3) elevated to a feed hopper with an air conveying system or other conveyor. In such instances, check for sanitary dumping and handling to prevent contamination of the salt.

Item C30—Fines Return & Fines Saver (58.428).

Show NA for this item if the fines are not returned to the cheese.

Dismantle and inspect all components for condition and sanitation.

Encourage the practice of keeping the fines container up off the floor on a shelf, rack, or separate stand (when allowed to sit on the wet floor, water from the bottom exterior surfaces can fall in the cheese vat when the container is emptied).

Under most circumstances, the fines saver should be operated with a cover in place to protect the whey and fines from external sources of contamination. There may be exceptions, however, where such protection is afforded by location in a separate room or special area. When a cover is not employed, evaluate the situation and use your judgement.

Check that the screen, or any extra screens, are properly stored when not in use. Large radiator style hose clamps with exposed threads should be criticized.

If a separator-type fines saver is used, the areas that collect the fines shall meet product contact surface requirements. Check the *Accepted Equipment List* under the heading centrifuges to determine if the desludging section is acceptable for product contact. If the model is listed follow the inspection guidelines for Item B4—Separator. In addition, inspect the fines collection and outlet area. If a water rinse is utilized to flush the fines back to the drain tables or into a storage tank where they are to be reclaimed for human food, see the guidelines for Item A35—Product Rinsings.

Item C31—Hand Washing Facilities (58.127c).

See the guidelines for Item B21—Hand Washing Facilities.

Hand washing facilities shall be available in the immediate work area. Employees should wash hands prior to handling product; if possible, determine if this practice is being followed. When deficiencies are noted, recommend correction.

Item C32—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Brushes and cleaning materials should be kept in their proper place and miscellaneous utensils such as forks, rakes, pails and strainers should be stored in a sanitary manner. Also, check floors under cheese vats and the underside of vats and equipment for cleanliness following equipment cleanup after the day's operations.

Item C33.

Use this item with appropriate heading to cover improper use of defoamers or any other cheese making equipment located in the make room and not listed in this section.

Although defoamers are allowed to be used in whey, they are not allowed in whey cream, cream, or cheeses covered by a Standard of Identity such as Cheddar cheese. A defoamer is not permitted for use in such cheeses unless specifically listed in the optional ingredients section of the standards. However, due to specific functional needs and additional regulations covering the manufacture of reduced fat cheeses, a defoamer may be used for the manufacture of standardized cheeses that are formulated to comply with low fat or reduced fat label declarations. The improper use of a defoamer does not constitute a serious breach of a

Standard of Identity. If during a survey a defoamer is used in the production of a standardized full fat cheese, recommend that the plant discontinue its use immediately and assign the deficiency to category C. If on subsequent surveys a defoamer is still in use, elevate the deficiency to the next higher category until the plant has taken appropriate action.

Cheese Brine Facilities

Item C35—Room Construction (58.126, 58.408).

Preferably, cheese brine tanks should be in a separate room constructed so it can be readily cleaned. However, a separate room is not a requirement, so do not criticize brine tank location in a make room or packaging room, for instance, provided there is sufficient room and no interference with other processing activities.

If the factory does not salt cheese by the brine soaking method, show NA in the report heading for this section and leave Items C35-41 blank.

Item C36—Lighting & Ventilation (58.126d).

See the guidelines for Item A2—Lighting & Ventilation.

Item C37—Brine Tanks (58.422).

The brine tanks shall be constructed of suitable nontoxic material and should be resistant to corrosion, pitting or flaking. Good condition concrete or tile tanks are satisfactory. However, when flaked or deteriorated condition is noted and replacement is needed, recommend replacement with stainless steel, fiberglass-covered wood, or other suitable nontoxic material. Because of the strong corrosive effect of brine on most metals and paint, the tank exterior surfaces, legs, or other framework should also be constructed of stainless steel, fiberglassed wood, or other corrosion resistant material.

Fiberglass brine systems are to have surfaces that are at least as good as a good condition concrete tank. Fiberglass tanks should not possess rough, pitted surfaces with fabric folds or exposed fibers.

When unacceptable brine tank surfaces are noted, fill out a Nonconforming Equipment Report and attach it to the survey report so follow-up action can be taken with the manufacturer. Appropriate recommendation to bring the surfaces into compliance should also be made on the survey report.

Brine tanks may be mounted one atop the other, provided the exterior of the top tank is constructed to the same specifications as the product contact surfaces of the tanks. If such deficiencies are noted, describe them on the report together with a recommendation to correct the condition. Also, check for cleanliness and presence of mold on the underside of the tanks. Employees shall use sanitary procedures when working with the top vats. Employees shall not stand on the edge of the lower vat. If noted, recommend that this practice be stopped immediately. Also evaluate the adequacy of alternative means of access provided by management.

Walkways over brine tanks shall be solid so that debris cannot fall into the tanks. In addition, there shall be a kick plate a minimum of 4-inches high on the portion of the walkway over the tank.

Item C38—Control of Brine Quality (58.422).

The brine tank shall be operated so as to assure the brine is clean, well circulated, and of the proper strength and temperature for the variety of cheese being made.

In a very small cheese operation, minimum compliance might be achieved by locating the tank in a cooler room for temperature control. However, note that without circulation brine strength tends to stratify as salt is absorbed into the cheese from the top of the tank.

When the brine tanks are located in a regular processing room, cooling of the brine may be necessary. The preferred method is for recirculation of the brine through a filter and cooler (plate or tubular type, for instance) and back to the tank. The filter removes impurities, the circulation prevents stratification of brine strength in the tank, and the cooler removes heat imparted by the cheese.

Cooling of brine with refrigerated copper coils immersed in the brine tank is a questionable practice. Excessive copper salts may be in solution in the brine and be absorbed by the cheese. Therefore, copper coils are unsatisfactory, recommend replacement with stainless steel.

Since the brine is very corrosive to ferrous metals, the piping used for recirculating the brine through the filter and cooler and back to the brine tank is often constructed of special stainless steel or rigid polyvinyl chloride (PVC). The use of rigid PVC piping for this purpose should not be criticized.

Plant testing for microbial contamination and salt strength should be encouraged to aid in maintenance of brine quality. As may be necessary, tanks should be cleaned and the brine should be heat-treated or filtered to control microbial contamination.

Note:

> When the brine quality is under good management control as indicated above, USDA has no recommendation for frequency of dumping old brine and making up a new solution. The frequency is a management option.

Item C39—Miscellaneous Utensils (58.428).

Use this item to cover inspection of any special equipment or utensils employed in or around the brine tanks, including such items as tables for removing cheese from hoops, brine tank dividers, salt buckets, tools for moving the cheese, etc. Check that construction is of stainless steel, or rubber or plastic material that meets the 3-A Sanitary Standards and that 3-A principles

are followed in the fabrication. Also check for sanitation and proper storage of these items when they are not in use.

Item C40—Cheese Drying After Brining (58.428).

Check that facilities for drying cheese after brine immersion are constructed to protect the cheese from contamination. Product contact surfaces of such equipment must be made of stainless steel or rubber or plastic materials that meet the 3-A Sanitary Standards. If a drying tunnel is used, check interior surfaces for freedom from peeling paint or rust (because of brine, stainless steel construction is desirable although not required).

Item C41—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese Packaging

Item C43—Room Construction (58.126, 58.410, 58.411, 58.413).

See the guidelines for Item A1—Room Construction.

A separate room for packaging rindless bulk cheese is not mandatory and the packaging operations may be conducted in the cheese make room (or any suitable section of a processing area).

The room or area shall be free from dust, condensation, mold, or other conditions which may contaminate the surface of the cheese or contribute to unsatisfactory packaging of the cheese.

When applicable for rind cheese, a separate room or compartment should be provided for paraffining and boxing the cheese. The room shall be of adequate size and the temperature maintained near the temperature of the cheese drying room to avoid sweating of the cheese during paraffining.

Item C44—Lighting & Ventilation (58.126d, 58.410, 58.411, 58.413).

See the guidelines for Item A2—Lighting & Ventilation.

Check for 30 F/C of light and light protectors.

If rindless bulk cheese is packaged in a separate room, ventilation of the room with filtered air under slight pressure is desirable, but this is not a requirement.

Item C45—Barrels, Carts & Conveyors (58.420, 58.424, 58.425).

Use this item for any deficiencies that could affect the quality or wholesomeness of the cheese. Deficiencies that affect the whey should also be recorded on Page W.

When applicable, check the condition of barrels used. Some barrels are constructed of steel, lacquered inside and painted outside, are poly lined, contain approximately 500 pounds of cheese, and require cleaning and paraffining after each use in order to be maintained in good condition. The empty barrels shall be stored in an enclosed, clean, dry area. When barrels are not properly stored or are rusty, in poor repair, not clean, or in need for reconditioning, make a recommendation for correction. Indicate how many barrels were inspected and how many were found unsatisfactory.

When American type cheese is hooped directly into barrels, whey drainage is usually facilitated by turning the barrel on its side with a portable cradle or by use of a mechanical sling from an overhead monorail. Some plants also have other special equipment for positioning barrels for drainage.

When a monorail is used, check for appropriately constructed shields under the monorail carriages to protect empty and filled barrels and whey drain pans from paint chips, rust, oil, etc. If no shields are present, recommend that they be provided.

When cheese is packed in large collapsible plastic or wooden boxes (waxed), inspect the box components for condition, and also check the filling, pressing, dressing, and final packaging operations.

Item C46—Hoops, Forms & Press Cloths (58.418e, 58.420, 58.421, 58.429).

Inspect hoops or forms for condition and cleanliness. Construction material shall be stainless steel, suitable plastic, or well-tinned iron (usually, tinned hoops are employed mainly for small styles). Check the forms for fabrication deficiencies such as bolted construction, rough product contact surfaces, cracks, crevices, etc.

Hoops for American Cheese shall be washed daily. Do not criticize the common practice of immediate refilling Mozzarella hoops for more than one use during the same day.

The *Accepted Equipment List* shows manufacturers of cheese molds that have obtained USDA acceptance of their products. To obtain this acceptance, the plastic materials used must comply with the applicable Food and Drug Administration regulations (21 CFR Parts 170 to 199) and also with the *3-A Sanitary Standards for Multiple—Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* . There are a variety of plastic materials available which meet both of these requirements and would therefore be satisfactory for use in fabricating cheese molds.

Several cheese plants which manufacture cylindrical shaped cheese such as Parmesan, Romano, and Longhorn styles of Cheddar and Colby have purchased rigid PVC (polyvinyl chloride) pipe of the proper diameter, cut it into proper lengths and use these as cheese forms. Since PVC has not been found to comply with the FDA requirements and the 3-A Sanitary Standards, it is unacceptable for use as cheese forms in USDA approved dairy plants. If any USDA approved dairy plant currently using PVC cheese forms, recommend the INELIGIBLE status (category A deficiency).

There are several other classes of plastics that do meet the requirements. These can also be purchased in lengths of specific diameter pipe, cut to the proper lengths, have holes drilled for whey drainage and be acceptable for use as cheese forms in USDA approved plants. Plastics such as polyethylene, polypropylene, polystyrene and extruded nylon which meet the requirements could be used. Cheese plants which elect to use acceptable types of plastics should request that the plastics supplier provide them with certification that the plastics meet our requirements. This certificate should remain at the plant for review during plant inspections.

When a mechanical hoop washer is used, inspect the machine for sanitary condition and maintenance. Check that solution temperature and pressure are controlled to achieve

satisfactory cleaning of hoops. Check also for adequate venting to the outside. Make any needed recommendations under this item.

Examine press cloths for sanitary condition. When the appearance or odor of press cloths indicate improper cleaning, recommend adoption of an effective daily cleaning procedure. Badly worn, ragged cloths are also unsatisfactory, recommend replacement. Single service type press cloths should be used only once.

When used, the washing machine for press cloths should be of commercial quality and size or be of sufficient size to handle the applicable load. It should be equipped with temperature and water level controls. In effect, this means that family type washing machines are considered satisfactory for washing press cloths when they are properly loaded and are properly cleaning the cloths. If this is not the case, then larger commercial style washers should be recommended.

Item C47—Hooping Equipment (58.128a, 58.418b, d).

A. Manual Hooping.

Check that shovels, funnels, etc. are properly constructed and stored under sanitary conditions.

B. Automatic Curd Conveyors.

Salted curd is often moved to a hooping station for blocks or barrels by means of an air conveying system. §58.418b requires stainless steel construction, cleanable design, sufficient size unit, and provision with “filtered air of the quality satisfactory for the intended use. Air compressors or vacuum pumps shall not be located in the processing or packaging area.”

The major uses of pneumatic conveying equipment are to move salted curd to hooping stations and to convey ground cheese to blending vats. All of the major commercially available systems (Damrow, Kusel, and Stoelting) use rather large volumes of air at low pressure of approximately 5-15 PSI to convey the cheese. Cubic feet per minute (CFM) depends on the sizing of the system, but usually falls into the 300 to 1300 CFM range for conveying cheese curd. Some large systems for conveying ground cheese may use considerably more. The slightly compressed air is usually supplied by rotary pumps commonly called “blowers” (as compared to fans which deliver very high quantities of air at very low pressures and to compressors which supply relatively low volumes of air at very high pressures). The rotary blowers usually have air prefilters of various types on the suction side. The blowers are made of iron and have iron appurtenances such as prefilter housings, sound mufflers, check valves, and associated piping. The interior surfaces of iron components are subject to rusting and therefore a downstream filter is required, together with corrosion resistant piping from the filter to the cheese pickup point.

Since the air blower is not located in the processing area, the air supply pipeline may be quite long. When the final filter is located near the blower, the air piping from the final filter may be

made of threaded stainless steel, sanitary stainless steel (that is, with either welded joints or "3-A" fittings), aluminum, rigid PVC, copper, or any other suitable nontoxic material which is corrosion resistant. However, if other than sanitary stainless steel piping is used, conversion to sanitary stainless steel piping must be made a few feet upstream of the cheese pickup point. The connection should permit easy dismantling to allow take down and inspection of pipes downstream of the connection. Another alternative would be to locate the final filter relatively close to the cheese pickup point, in which case iron piping can be used between the blower and the final filter.

Regular cleaning of the air line, upstream from the sanitary connection, should not be necessary if backflow of product or liquids is prevented during shutdown periods. Such backflow can be prevented by locating the sanitary connection in a vertical section of air piping which comes from above, toward the cheese pickup point. Where this is not practical and a horizontal air line is required prior to the cheese pickup, the sanitary connection should be taken apart and capped off during shutdown and cleanup operations (optionally, a valve might be installed to serve the same purpose). The system should have pressure relief protection to prevent damage in case the blower is accidentally started while the line is blocked.

Minimum filter efficiency should be 85% when tested in accordance with the ASHRAE Atmospheric Dust Spot Method when operated at its design face velocity (this is the same filter efficiency specified in 3-A Accepted Practices). We understand that the 85% efficiency by this test would approximate the removal of 93% of airborne particulates in the 1-5 micron range. Use of higher efficiency filters is a management option.

As with any filter installation, it is important that air bypassing be avoided by filter design or use of gaskets in the filter frame or cartridge (the physical shape and size of filters will vary considerably depending on design and size of the pneumatic system).

Other conveyors, such as auger, belt, or vibratory types, are also used to convey salted curd to the hooping station(s). Inspect conveyors for conformance to the §58.128a or §58.418b requirements as may be applicable.

C. Automatic Curd Filling or Hooping.

§58.418d requires stainless steel construction, cleanable design, sufficient size unit, and accurate control of curd weight into the container. Some curd filling units also have automatic devices for moving the containers through the machine and for tamping the curd. These automatic curd fillers are usually manually cleaned. Check for sanitation and condition and make recommendations as may be necessary.

Item C48—Whey Probes (58.428).

Use this item when the plant is making cheese in large styles such as barrels or 640's and is using vacuum probe equipment to withdraw whey from the cheese. Note any deficiencies to the exterior of the probes under this item. Deficiencies on the interior of the tubes and other

fittings should be recorded on Page W Collection of Salty Whey. Use Item C45—Barrels, Carts, & Conveyors to cover inspection of barrel drain carts, conveyors, etc.

Probe design varies. Most probes consist of a tube within a tube. Dismantle the probes and slide the tubes apart. Check for sanitation and rough welds, open seams, etc. Make appropriate recommendations. Some 640 operations use a wedge-type system to allow the whey to drain out the bottom of the box. Remove the wedges from the support and check sanitation and condition.

Item C49—Cheese Press (58.421).

A. Conventional Presses.

Check that presses are made of stainless steel with welded joints and cleanable surfaces, including trough, rails, rail supports, and press head. Also check that the pressure device is a continuous type which exerts uniform pressure on the cheese. This requirement can be satisfied by hydraulic or air type press devices, or by hand operated press jacks which exert continuous pressure by means of springs at either or both ends of the press. In the case of barrel cheese and some other types, weights may also be satisfactorily used to exert continuous pressure. When weights are employed, check that they are constructed and maintained in a satisfactory manner. Also, inspect presses for cleanliness, including exterior surfaces, and sanitary construction.

B. Tower Block Formers.

1. Preparation of towers for inspection:

Dairy Grading Branch inspectors shall not attempt to prepare the block former for inspection. The procedures for preparation prior to inspection must be performed by a qualified plant employee.

The block former control panel must be switched to “manual” mode. The front door should be opened and blocked with a suitable material to prevent accidental closing. Next the guillotine should be pushed back into the rear chamber by hand. Remove compressed air supply to the main control panel.

Check to see that all electrical switches are in the off position, and are locked out with padlocks.

2. Inspection:

Start at the top of the tower and work downward. Assistance of a plant employee will be required. Make recommendations as appropriate when deficiencies are observed.

The following guidelines can be used to inspect nonwelded towers as well as the new welded tower. Removal of the upper screen attachments used in the older towers will require removal

of the exterior jacket of the tower. If this is done, it is recommended that only five screen bolts be removed and the areas between the screen and tower wall checked before replacing the retainer bolts. Note that each screen will have six bolts. Three upper and three lower. By removing three upper and two lower, the screens can be flexed enough to inspect the areas between the upper screen and tower. The sixth bolt can be left in place to hold the screen.

The older towers have plastic seals or washers to seal the screen retainer bolts and holes instead of USIT seals. Care must be taken so all parts are accounted for when plant employees reassemble the screen retainers.

Inspection of the lower sections of the older towers is performed the same way as the all welded tower.

Also, check the thin white sidewall flange gaskets for condition and cleanup. Make appropriate recommendations if soil accumulations, pitting, deteriorated gaskets, etc. are observed.

a. Remove the curd supply line, CIP lines, and top cover of the tower. Check the areas for proper cleaning, pitted areas, rough welds, deteriorated gaskets, and other construction deficiencies.

b. Dismantle and inspect the air valve assembly in the curd feed line. Observe for soil accumulations, deteriorated O-rings or pitted areas.

c. Inspect the CIP fittings, valves, and gaskets. Check spray balls for debris.

d. Check the gasket and underside of the top cover for condition and general cleanup. If the gasket is glued to the cover, it shall be firmly attached and shall be free of loose areas which could collect water or soil. The gasket should be flush with the tower interior when the cover is bolted to the tower. The gasket and surrounding areas shall be free of excess glue. If the gasket is torn, cracked or rough recommend replacement.

e. Place a clean plastic bag or other clean, suitable material over the block lift plate at the bottom of the tower. The material used should be placed to catch the USIT seals that may drop from the top of the tower when the screen retainer bolts are removed.

f. Remove one side of one screen at a time. If the bolts from both sides of one screen are removed at the same time, the screen may drop and become wedged in the lower part of the tower. The long side of the screen will have six bolts and the short side will have four bolts. One USIT seal will be positioned under each bolt head and one between the screen and sidewall of the tower. As the bolts are removed, the USIT seals between the screen and tower sidewall may fall to the lower part of the tower.

Care must be taken to assure that all USIT seals and bolts are accounted for after they have been removed from the screens. If a seal becomes lodged between the screen and sidewall, shake the screen or use a water hose to flush the seal down to the plastic-covered lift table. If USIT seals or bolts are left inside the chamber serious damage could result, and metal parts could contaminate the cheese or whey.

Check the USIT seals and bolts for cleanup. Check for pitted bolt heads or USIT seals. USIT seals are not reusable, they shall be replaced with new ones. If extra seals are not available, perform the inspection, and instruct management to replace damaged seals at a later date.

After the bolts have been removed from one side or the other, fold the top section of the screen inward. Using a strong light, examine the exterior of the screen and inside wall of the tower. Careful attention should be given to the areas where the USIT seals rested against the screen and tower sidewall. Allow the screen to snap back in place and then check the interior of the screen surfaces. Loosen at least two sides of one screen for the inspection of the top areas of the tower. Observe for curd remnants or soiled areas. If the areas that are examined are found clean, it is not necessary to remove the second screen.

After the top screen(s) have been inspected, the bolts and USIT seals should be replaced and tightened before proceeding. A special tool is available for holding the USIT seals in place between the screen and tower sidewall as the bolts are being replaced (this tool will be provided by the tower manufacturer). The seals can only be replaced by using the special tool (use of silicone is not acceptable). If the seals are not replaced, it will be impossible to pull a satisfactory vacuum inside the tower.

g. Next examine the lower sections of the screens and tower interior walls. Using the highly polished stainless steel mirror supplied by the manufacturer, carefully examine the lower sections of the tower. Use a strong flashlight or spotlight to provide adequate lighting. It may be desirable to have another person hold the light either at the top or bottom of the tower while you inspect these surfaces. Check for soil accumulations, milkstone, or curd particles. There may be areas where the screen has rubbed the polished surfaces of the tower sidewall. If the areas are rough or pitted, make appropriate recommendations.

3. Examination of The Tower Base:

a. Remove the cover from the rear whey collection chamber. Check the cover gasket for condition and sanitation. Inspect the interior of the whey collection chamber for milkstone buildup or curd remnants.

Check the rubber seal above the guillotine. It should be clean and free of cracks, broken areas, and milkstone. Recommend replacement if the seal is damaged. The seal can be removed by simply pulling it off of the retainer pegs.

b. Check for soil behind the small metal flapper plate positioned directly above the guillotine seal. This plate acts as a check valve when vacuum is being pulled inside the tower.

c. Next remove one of the rear plastic bearings from the two guide rods for the block pusher plate. Check the seal around the plastic bearing. It should be clean and free of cracks or splits. If milkstone accumulations are noted on the plastic parts, recommend that the cleaning program be modified to provide proper cleaning.

The front bearings are pressed into the steel plate, and cannot be removed without damaging the bearing. If the bearing is tight, it should be considered satisfactory. If either of the bearings are loose, recommend that they be replaced with new ones.

Removal of the plastic block push plate requires considerable time. If the plate and rods are tight, they should not be removed for inspection. If the connections are loose recommend that new parts be installed. Check the plastic grooves for the guillotine. These grooves act as a bearing for the guillotine as it moves back and forth. The areas should be free of milkstone, curd particles, and black film.

d. Check the block lift plate and plate chambers. The area under the lift plate is a nonproduct zone. This area should be free of curd particles, product residue, and odors.

e. Inspect the front door assembly. If the doors are of the two-piece bolted type, have the parts taken apart. The inner areas should be dry and free of residue and odors. If the gasket is rough, cracked or stained recommend replacement.

Check the exterior areas of the door and cheese block discharge conveyor or slide. Careful attention should be given to the underside of the discharge slide assembly.

f. Open the electrical control boxes and remove the tower side panels from the base. Check the areas with your flashlight. These areas should be clean and free of product residue and insects.

4. Examination of Whey Removal Pipelines Valves and Tanks:

If the plant requests status for the whey operations, deficiencies in this area should be recorded on Page W.

5. Inspection of Vacuum Lines and Related Equipment:

Each tower is supplied with vacuum lines and a vacuum interceptor tank. As the cheese is vacuumed within the tower, vacuum is drawn through the interceptor which may or may not be located at the top level of the tower (some plants have the interceptors located at the base of the towers, either position is satisfactory).

There are two styles of vacuum interceptors. One style has a bolted cover and gasketed flange, the other is of all welded construction. All towers manufactured at this time have the all welded style interceptors.

It is normal for some moisture and fine curd particles to be drawn into the interceptor. Generally, the interceptors are not considered product contact areas. Valves at the bottom of the vessel remain closed until the towers are cleaned. At that time, the vacuum lines, valves, pumps, and interceptors are cleaned.

Inspection of the vacuum lines, pumps, pipelines, valves and interceptors should be limited to a general check of interior surfaces. Areas should be relatively clean and free of yellow build up. Do not become concerned if one or two small curd particles are noted inside these fittings. If on the other hand the areas have solids buildup, make appropriate recommendations to improve cleaning of the vacuum system.

Item C50—Cheese Vacuumizer (58.423).

Bulk cheese vacuum chambers, if used, should be installed so that floor surfaces underneath are effectively sealed or have enough clearance so they can be cleaned.

Inspect interior surfaces of the vacuum chamber for cleanliness and condition. Per §58.423, the vacuumizer "shall be satisfactorily constructed and maintained so that the product is not contaminated with rust or flaking paint. An inner liner of stainless steel or other corrosion resistant material should be provided." If the vacuumizer has peeling paint or rust conditions on the sidewalks or ceiling, recommend resurfacing, preferably by lining with stainless steel or other equally corrosion resistant metal. Coating with either hot dip or cold galvanizing compound would also constitute satisfactory protection of the interior surface.

Item C51—Wrapping Table & Scale (58.128m, 58.419).

If rindless cheese is made, check the facilities for wrapping and weighing. The table top for wrapping and the scale platform shall be stainless steel or other hard material that can be cleaned and maintained in sanitary condition.

It is not necessary for the survey inspector to check compliance of the scale for graduations and accuracy tolerances specified in §58.128m: "Compliance shall be determined by the appropriate regulatory authority." Usually this will be a state or local department of weights and measures which checks scales routinely. Deficiencies regarding scale graduations or accuracy

tolerance will not be considered as a significant factor in the assignment of plant status. In the event that official test weighing is requested, it is required, of course, that a suitable accurate scale be provided as outlined in separate instructions for inspection, sampling, and test weighing of cheese. The inspector involved would be responsible for checking that the scale is suitable and accurate.

Item C52—Rindless Sealing Equipment (58.426).

Check a few finished blocks to determine whether the wrappers are tightly applied and adequately sealed. For wrappers using wax as a sealing agent (parakote, aluminum foil, etc.), the kraft outer wrapper is melted, causing the outer wrapper to have a mottled, greasy appearance. Wrappers employing sealing techniques other than wax should be closely examined to determine if a complete seal is obtained.

As a general rule, only a cursory check need be made of the wrapping and sealing operation for rindless block cheese. It is not necessary to report type of wrapper, sealing temperature, sealing method, etc., unless to illustrate deficiencies in the procedures. When the cheese is being offered for grading it is the responsibility of the grader to check for proper wrapper application and sealing. However, when wrapping and sealing deficiencies are noted during the survey, recommend needed corrections.

Individual block sealing presses shall have square interior corners, reasonably smooth interior surface and have controls that provide uniform pressure and heat equally to all surfaces (the amount of pressure, heat, and time to be applied will vary considerably depending on the equipment and the kind of wrapping material used). If deficiencies are noted, recommend correction.

If the plant utilizes a machine that performs automatic wrapping of individual blocks, together with vacuumizing and sealing of the wrapper, check that the manual “unhooping” of the cheese and the feeding of the machine are performed in a sanitary manner.

When cheese is packed in cryovac bags and sealed by the heat shrink and bag clip method, check the hot water shrink tank and related equipment for condition and sanitation.

When cheese is to be paraffined, proper conditions should be maintained to produce a sound, dry rind on all surfaces of the cheese. This usually requires one or more days on the shelf with the cheese being turned once a day.

Drying of cheese on new clean scale boards on top of wood cheese boxes or box covers is satisfactory. However, the housekeeping and space requirements of this practice would make it suitable only for very small cheese operations.

When applicable, check that the carts and shelves used for drying the cheese are paraffined. They should be constructed of material that can be cleaned and maintained in a sanitary manner and free of mites. Recommend replacement of any deteriorated wooden shelves, standards, or carts. Wood construction in sound, clean condition is satisfactory.

If there is considerable volume of cheese for drying, a separate room shall be provided, of adequate size to accommodate the maximum production.

If the plant paraffins rind type cheese on the premises, use this item also to cover your inspection of the paraffining and boxing operations. When applicable because of the volume of cheese so handled, a separate room or compartment should be provided. Also check that the temperature of the room is maintained about the same as the drying room to avoid sweating of the cheese prior to paraffining.

The paraffin tank should be equipped with an indicating thermometer and facilities for automatic temperature control. Do not make recommendations about the temperature of the paraffin, this may vary considerably depending on the kind of paraffin and the manufacturer's advice in this regard.

Item C53—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Observe the general housekeeping in the packaging area. Packaging material and supplies should be kept off the floor and stored so as to preclude contamination of the materials. Supplies in the immediate packaging area should be maintained in a neat and orderly manner. Product contact material should be kept covered when not being used.

Item C54—Bulk Cheese Markings (58.438, 58.439, 58.445). Use of Antimycotics.

Use this item and the heading “Bulk Cheese Markings” or “Use of Antimycotics” to make recommendations about any noted deficiencies.

A. Bulk Cheese Markings.

Observe the markings present on the finished bulk packages. Bulk packages shall be legibly marked with the name of the product, name and address of manufacturer (or distributor) or state assigned plant identification, and vat number (although not required, it is industry practice to also show net weight on bulk cheese). When markings are satisfactory, no comments need be shown on the report.

When the cheese is marked as “pasteurized,” “made from pasteurized milk,” or words to that effect, follow the guidelines for Item C6—Heat-Treating or HTST Equipment.

The labeling requirements for raw milk or heat-treated milk cheese are found in 21 CFR 101.100 (f) (1), (2), and (3). Subsection (3) is for Cheddar, washed curd, Colby, and granular cheeses. It requires;

1. Each cheese shall bear a legible mark on the cheese showing the date at which the preliminary manufacturing process has been completed and at which date curing commences.

2. A removable tag shall be affixed to each cheese, wrapper or container containing the following:

> "_____ cheese made from unpasteurized milk. For completion of curing and proper labeling, or for labeling as _____ cheese for manufacturing."
>
> The blank being filled in with the applicable name of the variety of cheese.

B. Use of Antimycotics.

The FDA standards of identity in 21 CFR 133 subpart B list the ingredients that are allowed in each type of cheese. Many of these standards allow the use of antimycotics (mold inhibitors that are usually applied to the surface of the cheese). If antimycotics are used by the plant, use this item to list any deficiencies noted.

Antimycotics are allowed on the exterior of the following bulk cheeses for manufacturing or during curing and aging: Asiago, Blue, Brick, Edam, Gorgonzola, Gouda, Granular, Washed curd, Stirred curd, Hard grating cheeses, Monterey jack, Muenster, Parmesan, Romano, Swiss, and Soft ripened cheeses.

In addition to being allowed on the exterior, antimycotics can also be added during the kneading and stretching process of the following bulk cheeses: Mozzarella, Provolone, Scamorza.

The Standards of Identity allow the use of antimycotics on the surface of consumer slices, cuts, and packages of the following cheeses: Blue, Grated or shredded cheese (any variety), Cheddar, Colby, Cold pack, Greyer, Pasteurized process, Samsoe, Semisoft or Semisoft part skim, Spiced cheese. 21 CFR 172.155 was amended to allow the use of Natamycin (also known as pimaricin) on any cheese surface rather than limiting its use to consumer packages. This regulation is specific to natamycin and does not apply to any other antimycotic. In addition, §172.155(c) limits the amount that can be used to 20 milligrams per kilogram (20 ppm) in the finished product. Therefore, the use of Natamycin is acceptable on the surface of cheddar cheese regardless of the type of package.

Antimycotics are not allowed on the following cheeses: Cook cheese (Koch kaese), Cottage cheese, Cream cheese, Roquefort, and Sop sago, Skim milk cheese for manufacturing, and Bulk Colby.

If a plant is producing cheeses that do not have standards of identity (any type not listed) the use of antimycotics is allowed.

When the above guidelines are not being followed or if chlorine is being used as an antimycotic, recommend the practice be discontinued and assign the deficiency to category C.

Because these compounds are not dairy products, construction of the interior of the applicator does not need to meet dairy product contact requirements. However, the method used to apply the antimycotics shall protect the cheese from contamination. If a hand held sprayer is used it shall be stored between uses in an acceptable manner and be kept clean. Some plants may utilize a spray head powered by air under pressure. In this case the air shall meet the requirements of *3-A Accepted Practice for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-* and if the spray head is mounted permanently in the dairy product zone it's exterior shall meet the requirements of a product contact surface. The plant shall not use paint brushes, rags, sponges, paint rollers, or other applicators that cannot be kept sanitary.

Product Storage

Item C56—Room Construction - Coolers (58.126, 58.154, 58.412).

See the guidelines for Item B51—Room Construction - Coolers.

Check the floor for cleanliness. When large bulk style or fiber barrel cheese is stored more frequent cleaning of the floor may be required

Item C57—Room Construction - Warehouse (58.126, 58.153).

See the guidelines for Item B53—Room Construction - Warehouse.

Item C58—Lighting & Ventilation (58.126d, e, 58.412).

See the guidelines for Item B54—Lighting & Ventilation.

The guidelines for Item B54 also apply to coolers for fresh cheeses such as Cottage, Bakers, etc., and for drying, storage, and curing rooms for American or similar type cheese. Moldy conditions in such rooms are considered a serious deficiency.

Special temperature and high humidity conditions are required for curing of certain varieties of cheese. Although all other sections of B54 apply, moldy conditions will not have the same significance in the following situations:

A. Cheese Rooms Where Mold Growth is a Step of the Cheese Making Process.

Blue, Gorgonzola, Brie, and Camembert are examples of such types. These cheeses are mold covered upon completion of the curing process.

It is not unusual for some mold to grow on adjacent curing shelves. Under such conditions where the mold appears to be a desirable type for the particular cheese, its presence is not considered a deficiency. However, the walls, ceiling, and shelf supports should be free of mold.

B. Curing Rooms for Surface Ripening Cheese.

Some cheeses, such as Brick, Limburger, Liederkranz, Muenster, etc. require high humidity conditions to support the surface ripening characteristic of the cheese. But at the same time the high humidity is conducive to mold growth. However, the walls, ceiling, and shelf supports should be free of mold.

C. Long hold cheese curing rooms.

Parmesan cheese for instance is cured a minimum of 10 months and often up to 18 months. Romano is cured for not less than 5 months. These cheeses too, may become mold covered

during the long curing process and are then machine brushed and cleaned before final packaging. The mold is not essential to the cheese making process, but is not harmful, being only a surface growth due to hard rind condition. Mold development on the cheese is difficult to avoid because of the necessary cheese curing temperatures and the humidity range necessary to avoid excessive drying of the cheese and cracked rind condition. However, the walls, ceiling, and shelf supports should be free of mold.

Item C59—Temperature Control (58.412, 58.510d).

See the guidelines for Item B55—Temperature Control.

Item C60—Housekeeping (58.126e, 58.127f, 58.146d, 58.154).

See the guidelines for Item A7—Housekeeping.

When product and supplies are being stored on pallets or floor racks, check the item satisfactory (no comment needed). If product or supplies are stored on the floor make an appropriate recommendation. The floor under pallets or racks should be kept clean.

In the case of cheese in metal barrels and 640's, it is not necessary to use pallets provided the cheese is removed from the cooler regularly and the floor is maintained in a clean condition. More rapid and uniform cooling of barrel cheese is promoted by storage on slats or pallets, however, this practice is not a requirement.

Check that storage is orderly and good housekeeping is maintained.

General Items

See the guidelines for Page A — General Items.

Page D. Inspection of Dry Products—Spray Process. (Form DA - 151 - 4)

Processing and Condensing

Item D1—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Evaporator condensers which are equipped with full barometric legs often terminate in a tail-pipe pit located within the plant, particularly where climatic conditions would present freezing problems for an outside pit location. During evaporator operation, the tail-pipe pit receives the mixture of condenser water and condensed vapors removed from the milk. Usually the pits are covered with iron grilles or loose fitting iron plates. This is satisfactory. Sealed covers for such pits are not required as for sanitary sewer system drain pits or sumps. During regular evaporator operation, the pit is continually flushed with large quantities of tail pipe water. While it is true that this water contains some milk entrainment, the evaporator shut down and cleaning procedures generally flush the pit so that odor problems are seldom encountered during shutdown periods. If they do occur, the pit should be cleaned.

Item D2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item D3—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Inspect a sufficient number of pumps, pipelines, valves, and fittings to evaluate condition and cleanliness of this equipment. Also check for dead end piping under the evaporator, especially in the pump-out piping used at the end of the run. Dead ends may also be found in the piping of old style level control devices for some evaporators. Recommend replacement of such level indicating or controlling devices which require the product to reside for long periods in the control piping.

Item D4—Separator (58.128a, e).

See the guidelines for Item B4—Separator.

Item D5—HTST Sealed _____ at _____ sec. _____° F (58.128, 58.236, 58.809).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec. _____° F.

Fill in the required information about sealing date, forward flow hold time, and "cut-out" divert temperature.

It has been long standing Dairy Division policy that milk and milk products be pasteurized prior to condensing in an evaporator. §58.236a and §58.809a of the *General Specifications* outline these requirements, which are based on public health considerations. Without pasteurization to destroy staphylococcus aureus bacteria prior to condensing, the possibility exists that staphylococcal enterotoxin, which is heat stable, may be produced within the evaporator.

Evaporative condensing is used to produce condensed milk and milk products which then may be used in a variety of end products. These end products include not only condensed and dry milk and milk products, but also condensed milk which is used to standardize the solids content of milk for cheese making. Regardless of the end use, milk or milk products shall be pasteurized prior to condensing.

If during plant surveys you encounter situations where pasteurization prior to condensing is not being accomplished, using legally sealed pasteurization equipment, the INELIGIBLE status shall apply for all products produced from the condensed milk or milk product.

Summary of pasteurization requirements for various dry products.

A. Dry Whole Milk, Nonfat Dry Milk (58.236a).

Milk or skim milk used in the manufacture of these products shall be pasteurized prior to the evaporator at a minimum temperature of 161° F for at least 15 seconds or its equivalent.

Note:

> Pasteurization of whole milk prior to the separator as practiced at a few NDM plants will satisfy this requirement.

Condensed milk products made from pasteurized milk may be transported to a drying plant, provided that it shall be effectively repasteurized at the drying plant, prior to drying, at a minimum temperature of 166° F for at least 15 seconds or its equivalent.

B. Dry Buttermilk (58.236a).

All buttermilk shall be pasteurized prior to condensing at a minimum temperature of 161° F for at least 15 seconds or its equivalent. When condensed buttermilk is transported to a drying plant, it shall be repasteurized at the drying plant prior to drying at a minimum temperature of 166° F for at least 15 seconds or its equivalent, except that acidified buttermilk containing 40% or more solids may be transported to another plant for drying without repasteurization.

C. Condensed Milk for Cheese Making (58.236a, 58.438).

Pasteurization at a minimum temperature of 161° F for at least 15 seconds or its equivalent is required prior to condensing. This pasteurization step is required even if the cheese is labeled as made from raw milk.

D. Dry Sweet Whey, Dry Acid Whey, Dry Whey Products, & Lactose (58.809).

> " *(a)* All fluid whey used in the manufacture of dry whey, dry whey products, and lactose shall be pasteurized prior to condensing. When the condensing and drying operations for the production of dry whey products by blending, and modified whey products by fractionation are located at the same plant, the pasteurization may be located at a different point in the operation provided it will protect the quality of the finished product and not adversely affect the processing procedure."

Wording shown above is a correction of the §58.809a version printed in the Federal Register of 10/10/75 and is shown here to make the intent of the second sentence clear.

The pasteurization point for the production of condensed whey for shipment from the plant, for dry whey, or for lactose made by conventional crystallization and separation procedures shall be prior to condensing the whey. There are no provisions for exceptions in the location of this pasteurization point in the manufacture of these products.

The second sentence of §58.809a permits a different pasteurization point in the process for certain products under certain conditions. This pasteurization point exception can apply to dry whey products made by wet blending and to modified whey products made by fractionation processes, (for example ultra-filtration, ion exchange, gel fractionation, electro dialysis, etc.) when, 1) the condensing and drying operations are located in the same plant, 2) the new pasteurization point will protect the quality of the finished product and 3) the new pasteurization point would not adversely affect the processing procedure.

Alternate pasteurization points meeting these criteria may be approved. If the alternate location involves pasteurization of condensed product, contact the National Field Director for guidance about required time and temperature for pasteurization of the product. Supply details about ingredients and total solids content of the product at the desired point of pasteurization.

When lactose is made by conventional condensing, crystallization, and separation procedures, pasteurization is required prior to condensing. When made in connection with other whey fractionation techniques (usually membrane processing), pasteurization may be at some other satisfactory point in the manufacturing process.

Condensed whey received from other sources shall be repasteurized at the drying plant at a minimum temperature of 166° F for at least 15 seconds or its equivalent, unless total solids content is 40% or higher.

E. Blended Products.

Blends (such as nondairy creamer), are usually various combinations of skim milk, NDM, buttermilk, caseinates, whey, soya flour, vegetable fats, etc. When these products are manufactured by mixing of all ingredients in a fluid state, followed by pasteurizing and drying, or by pasteurizing, condensing, and drying, and when all the dairy ingredients are made by USDA approved plants, the finished dry product may be characterized by an "S" code in the *Approved Plant Book*; when not, the "P" codes are assigned. However, both "S" and "P" code blended products shall be pasteurized in the fluid state after all ingredients are added during some appropriate stage of the manufacturing process.

When the HTST method is used, the required minimum temperature and hold time will depend upon the kind of ingredients and the total solids content of the mixture. Fluid products having dairy ingredients with a fat content of 10% or more, a total solids content of 18% or more, or which contain added sweeteners require pasteurization at a minimum temperature of 166° F for at least 15 seconds. The equivalent vat pasteurization treatment is 150° F for 30 minutes. Consult the National Field Director when questions arise about the appropriate pasteurization treatment.

These same dry blended products may be made by thoroughly mixing all of the ingredients in their dry form. For surveying such operations, use survey Page G—Dry Products Blending and Packaging.

Item D6—HTST or Vat Pasteurizer (58.128).

See the guidelines for Item B6—HTST or Vat Pasteurizer.

The forward flow of product after the flow diversion valve may go directly to a hot well; however, many installations provide for direct piping to the first effect inlet of the evaporator. In such case, a vacuum breaker and check valve or automatic shutoff valve downstream from the vacuum breaker, shall be provided in the line between the flow diversion valve and the inlet to the evaporator. This is required to prevent suction on the forward flow port of the flow diversion valve during diverted flow.

When the flow diversion valve is the double-valve type, such as the Crepaco, G&H, or Tri-Clover, the vacuum breaker is not required if the leak detector port is open to atmosphere.

However, when this port is piped back to the constant level tank, the separate vacuum breaker is required between the flow diversion valve and the automatic shutoff valve (most installations have the leak detector port piped back to the tank to avoid losing product to the floor during start-up).

A process cheese cooker is an acceptable pasteurizer for a cheese slurry (see the guidelines for Item K31—Cheese Cooker).

Item D7—Hotwell (58.216).

Many plants have hot wells for product preheating treatment or holding ahead of the evaporator. Use of a conventional "in-out" hot well shall not be considered a satisfactory alternative to HTST pasteurization equipment. Hot wells shall be enclosed or covered. To minimize foaming, the product inlet should be below the milk level or should be provided with a "down pipe." Check the hot well for sanitation, with particular attention to the dome, level control if any, and milk inlet and outlet areas.

If direct steam injection heating is used, the steam pipes and injection system in the hot well shall comply with the *3-A Sanitary Standards for Steam Injection Heaters for Milk and Milk Products, Number 61-* and culinary steam shall be used (see the guidelines for Item A36—Culinary Steam).

Review plant safeguards to prevent mixing of milk product and cleaning solutions. As a general rule, cross connection piping between product and cleaning solution shall be criticized. There shall be a full break between the two systems until all the milk is removed and actual cleaning operations are started on the milk handling system. Be particularly alert for cross-connection piping in this area because the hot well is often used to make up cleaning solutions for the evaporator (see the guidelines for Item A3—Pumps, Pipelines, & Valves for information on block and bleed piping).

Pipelines located inside the hot well which are cleaned-in-place shall have welded joints or specially designed loose fitting joints which permit effective CIP cleaning of exterior as well as interior surfaces. Hex nut or conventional CIP fittings are not satisfactory for this purpose. If noted, recommend replacement with welded or special joints. Daily removal of the pipelines for hand brushing of the fittings, although a satisfactory alternative, is not a practical solution.

Hot wells are often equipped with exhaust ducts to remove excess vapor. Such vent pipes should be made of stainless steel and be constructed so that condensate from inner or outer surfaces cannot reenter the hot well.

In the manufacture of dry whey, a light colored product may be desired. To accomplish this, the fluid whey may be bleached with a hydrogen peroxide or benzoyl peroxide solution, usually in connection with hot whey storage or "hot well" operations prior to the evaporator. Bleaching with hydrogen peroxide or benzoyl peroxide in this manner is a satisfactory practice (see the guidelines for Item W14—Utilization of Sweet Whey).

Item D8—Evaporator(s) (58.217).

New or replacement evaporators shall comply with *3-A Sanitary Standards for Milk and Milk Products Evaporators and Vacuum Pans, Number 16-* . If you encounter a newly installed evaporator or vacuum pan, which does not bear the 3-A symbol handle in the same manner as outlined in Item A3—Pumps, Pipelines, & Valves.

A Product Preheaters (58.215).

Many evaporator systems employ a number of vapor preheaters for the milk prior to the final heater (which is usually heated with steam). It is not necessary to check all interstage heaters at each survey when previous inspections showed satisfactory cleaning.

On tubular type preheaters, an adequate check on tubes can be made by opening two or three header plates or ells and checking these tubes. If these are not clean, open the heater completely for inspection. Also, check the condition of the gaskets.

If the heater is a plate type, it should be completely dismantled for inspection of each plate during each survey (see the guidelines for Item A27—Product Cooler).

Some evaporators have spiral type tubular preheaters which are fully enclosed inside the tube chests or inside milk vapor areas. This is permitted by the 3-A Sanitary Standards when the heat exchange surface is one continuous tube and the heater is designed to be CIP cleaned. Inspection of such heaters, other than the inlet and outlet, is impossible. Also, check on the company control of the cleaning regimen. If the other exposed parts of the evaporator are clean, such as the heating surfaces in each effect, there is reasonable assurance that the same cleaning regimen was also effective in cleaning the spiral tubes.

Except for the enclosed spiral type, check that preheaters are accessible for inspection. Where necessary, recommend means of safe access, such as ladders, decks, etc.

B. Tube Chests (Calandria).

Because of operation at low temperatures, especially in the last effect, it is especially important that evaporating equipment be clean and free of open seams or cracks. Inspect this equipment carefully, with special attention to condition and sanitation of the following areas:

1. Tube chests, or heating plates if evaporator is plate type.

2. Passages connecting tube chests and evaporating chambers.

3. Underside of distributing plates, baffles, and vapor separator devices, if used.

4. Vapor ells. These curved sections should be cleaned all the way around to the point where they slope down and away from the product zone in the evaporator. Because of location and construction, they are usually cleaned with properly located spray cleaning devices. However, on some units, cleaning is achieved by “boil-over” of cleaning solutions induced by manipulation of the amount of vacuum.

5. Control valves for regulating product inlet and transfer to subsequent effects.

6. Optional steam injection piping used during the cleaning cycle for solution heating and turbulence (usually installed in the milk chamber at bottom of each effect tube chest on rising film evaporators). Such piping should be disconnected during processing or be of stainless steel construction through the shutoff point and be free of “dead-end” conditions.

7. Air release valves, manhole gaskets, sight glass gaskets.

8. Cleanup and construction of continuous Baume testing equipment. The condensed product should not be exposed to the atmosphere at the point where tested. The open type Baume pot can be covered with a transparent dome which can be purchased from plastic manufacturers or the concentration of the product can be monitored with an in-line device, such as a refractometer.

Item D9—Evaporator Vapor Condenser (58.127, 58.217).

Evaporators with open type condensers (which utilize direct intermingling of product vapors and condensing water) shall be equipped with an automatic level control, barometric leg, or be so constructed as to prevent water entering the product. Condenser surfaces which contact milk vapors and condenser water are not sanitary or inspectable. Condenser water from these surfaces must not be allowed to enter the evaporator in case of malfunction whether or not the water was initially potable. Acceptable safeguards to prevent this include one of the following:

1. A full barometric leg extending at least 35 feet vertically from the maximum safe water level in the condenser system to the free water level at which the leg discharges, less one foot vertical height for each 1200 feet of elevation above sea level.

2. A safety shutoff valve, located in the water feed line to the condenser, automatically actuated by a control which will shut off the in-flowing water when the water level rises above a predetermined point in the condenser. This valve may be actuated by water, air or electricity, and shall be so designed that failure of the primary motivating power will automatically stop the flow of water (the above wording is from the *3-A Sanitary Standards for Milk and Milk Products Evaporators and Vacuum Pans, Number 16-05)*.

Closed type condensers by their construction (usually shell and tube type) provide for physical separation of condensing water from the vapors and condensate and therefore may use either safe or nonpotable water without further controls.

Closed condensers, or open condensers equipped with the safeguards stated above, may therefore use nonpotable water. Such water might be recirculated on cooling towers or spray ponds or be of otherwise nonpotable origin from nearby ponds or rivers. It shall be handled in separate water lines with no cross connections to potable water lines (review §58.127).

Make recommendations as applicable. Do not recommend a type of condenser. The open type condenser with proper safeguards should be considered as equivalent to a closed condenser with respect to protection from condenser water (also see Item D1—Room Construction).

Item D10—Cooler for Condensed Product (58.128a, 58.238).

See the guidelines for Item A27—Product Cooler.

Do not report product temperature unless it is unsatisfactory (should be 50° F or lower except that higher temperatures may be utilized for condensed whey during the crystallization process, or to make special blend products).

Item D11—Crystallizer Vats or Tanks (58.128, 58.809c).

Proper lactose crystal development usually involves slow cooling and controlled agitation for a period of time. Seeding with finely ground lactose is sometimes practiced. Do not criticize the slow cooling. It is necessary and is provided for by §58.809c.

Most equipment for crystallizing condensed whey and sweetened condensed milk is of the following types:

A. Vertical crystallizer tanks.

These vertical tanks usually have heavy duty, top-mounted agitators and cone shaped bottom construction. The tanks may have cooling jackets or simply have cold water spray rings on the exterior. Inspect the interior of the tank, the inlet and outlet valves, agitator shaft, sling, and all other appurtenances for condition and sanitation.

B. Coil type crystallizer vats.

These are usually horizontal type vats, very similar to coil pasteurizer vats for cream. Inspect them in the same manner, as outlined in guidelines for Item B6—HTST or Vat Pasteurizer, except that a recording thermometer is not required.

Item D12—Storage Tanks (58.128d, 58.237, 58.238, 58.810).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

Condensed product tanks may or may not be present in a spray drying operation. In some installations there is direct piping of the warm condensed product to the dryer. However if there is excess production over that which the dryer will take, it shall be cooled to at least 50° F and held at this temperature until used (also see Item D10—Cooler for Condensed Product).

When tanks are used for storage of sweet whey for more than two hours prior to processing, product shall be held at 45° F or lower or above 145° F. Check that a recording thermometer is provided to verify proper storage of whey as outlined in the guidelines for Item W8—Whey Heating or Cooling.

Item D13—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Drying

Item D15—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

The location of doors or adjacent operations should not cause excess or unnecessary personnel traffic through the drying area.

Check particularly for deficiencies in floor drains and traps that are located in the vicinity of air intakes for processing air.

Give special attention to ceiling, walls, and floors regarding insect control, following the guidelines of Item A37—Pest Control (if insect evidence is noted, report it under Item D56—Pest Control).

Item D16—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Ventilation of some dryer rooms is accomplished by air movement induced by the dryer air intake systems. Most Coulter dryer installations, for instance, have main air intakes and filters mounted high inside the building. Outside air is often introduced at a lower level, then is drawn across the room and upward to ventilate the room and also be warmed by the exposed hot surfaces of the dryer.

Even with dryer installations that draw air directly from the outdoors, ventilation is usually not a problem because of air movement in the room to supplementary air intakes.

Ventilation may be a serious problem, however, when drying systems are run only intermittently, or are shut down for considerable periods of time. In such instances, check more carefully for condensation, mold, etc.

Item D17—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Use this item to cover pumps, pipelines, valves, and fittings for product at the preheater area prior to the high pressure pump.

Item D18—Product Preheaters (58.128j, k, 58.236a).

See the guidelines for Item A27—Product Cooler (condensed product preheaters are usually of the tubular type).

Some drying systems do not employ a preheater for the product prior to drying. In such instances, show NA in the satisfactory column.

If the plant receives condensed milk or whey from another plant, it must be repasteurized at the drying plant. See the guidelines for Item D5—HTST Sealed _____ at _____ sec. _____° F (the high pressure pump at the dryer is sometimes used as the timing pump).

Item D19—High Pressure Pump (58.218, 58.219).

New and replacement high pressure pumps shall comply with the *3-A Sanitary Standard for Homogenizers and Pumps of the Plunger Type, Number 04-* . When inspection reveals poor condition parts, recommend repair or replacement with a pump meeting these 3-A requirements.

With good process planning, use of surge tanks can often be avoided. For instance, there should be no need for a surge tank at the pump-heater-high pressure pump complex just ahead of the dryer. The extra product flow from the heater generated by the heater recirculating pump may be bypassed back to the inlet piping of the recirculating pump.

When a surge tank is necessary for some special process reason, there is danger of bacterial growth (especially in the foam) if the product is held at critical temperatures for long periods of time. When applicable, make a recommendation for raising the product temperature to 150° F, or lowering it to 50° F, or using two surge tanks alternately every 4 hours with washing of tanks after each use. Covers, easily removable for cleaning, shall be provided and used at all times.

The high pressure pump is also used to circulate cleaning solution through the subsequent high pressure lines to the dryer. This recirculation may clean much of the interior of the pumps; however, it does not assure proper cleaning of the pistons, piston seal assemblies, some pressure gauge fittings, or low velocity areas in the intake manifold. Have the machine dismantled for inspection and check these parts carefully. Also check any fine mesh strainers and valves used in the condensed product line or at the pump. When pump cleaning deficiencies are found, recommend daily dismantling for hand cleaning.

Inspect the removable short high pressure line sections just prior to the spray device. These too, should be cleaned by solution circulation along with the main nonremovable (welded) sections of the high pressure line. Use this item to report any condition or sanitation deficiencies of the high pressure lines as well as the high pressure pump.

Note:

> The high pressure product lines are exempt from the design and construction requirements of the 3-A Sanitary Standards. Therefore, threaded fittings are acceptable. However, the lines and fittings shall be stainless steel.

For safety reasons threaded stainless steel pipe is usually used. Threaded fittings shall not be used on the inlet side of the high pressure pump. Also, ball valves used in the high pressure lines are not required to meet the 3-A Sanitary Standards for Ball Valves, but the product contact surfaces shall be stainless steel or acceptable plastic and they shall be cleanable. These valves shall be dismantled and hand washed each time the lines are washed.

Check the high pressure lines for dead ends that may be formed by improper placement of valves. Especially check valve location for bypass piping to the floor at the high pressure pump or where water may be introduced during loss of product flow. Proper location of valves at the dryer front is also important if some of the spray nozzles are not used during operation. Also, criticize brass or black iron check valves.

Item D20—Dryer Air Supply (58.220a).

A. Air Supply and Air Intake Location.

The source of air supply for drying, conveying or cooling powder shall be relatively free from objectionable odors, smoke, dust, or dirt. Unsatisfactory environmental conditions near the plant should be reported (poultry or livestock buildings or pens, etc.) Check the immediate vicinity of the air intake to the dryer for unsatisfactory conditions that may cause contamination; for example, an exhaust stack from a dryer or boiler near the main dryer air intake, main air intake drawing in air over a roof that contains excess powder, etc.

B. Air Intake Hood, Screen, etc.

The air intake openings shall be screened (maximum screen openings ¾ inch diameter). New dryer installations shall have louvers that can be closed when the dryer is shut down and a hood to minimize the intake of rain, snow, dust, etc. unless the nature and location of the openings accomplishes these purposes. Lack of such louvers and hoods on older dryers should not be criticized.

C. Air Inlet Plenums.

Construction requirements of the air ducts and plenums differ depending on the temperature of the air. The two types of air defined by 3-A are “air to be heated” (air over 240° F) and “air not to be heated” (air under 240° F).

On dryers installed after November 1998, plenums and ducts for air to be heated shall be constructed of stainless steel. Welds shall be continuous, whether or not they are ground and polished. All air contact surfaces shall be accessible and cleanable.

Dryers constructed before November 1998 that have been under virtually continuous USDA inspection may have air plenums and ducts for air to be heated constructed of galvanized sheet metal using conventional fabrication techniques (iron or Coreten are not satisfactory construction material for filtered air plenums or ducts). When rusty conditions are noted inside galvanized ducts or plenums that are downstream from the filters, recommend regalvanizing or replacement (removal of rust and recoating with cold galvanizing compound may be satisfactory if the rust damage is not serious). Painting of such inside surfaces is not a satisfactory practice. Recommend immediate removal of the paint if this is noted.

Ducts and plenums for air not to be heated shall meet product contact surface requirements (stainless steel, number 4 finish, proper radius, etc.)

D. Filtering of Process Air.

The air supply system and ducts shall be such that all of the air passes through properly installed air filters before coming in contact with product or product contact surfaces of the drying system. This 3-A requirement that dryers "be so constructed as to prevent the entrance of unfiltered air" should be met even on "pre-3-A" dryers, so if such deficiency is noted, recommend correction.

Drying systems commonly employ process air from two or more separate intakes, each of which may be fitted with a separate filtering system. Examples of such intakes are:

1. Main air intake, usually located ahead of an inlet fan and steam radiators or gas burners. This main process air supply is usually heated to over 240° F.

2. When the dryer is gas-fired, supplementary air to the burners is usually supplied by a separate small fan and air intake. Sometimes filtered air is conveyed by ducts from the main air intake (on most newer dryers, the gas burners are of a different type and do not require mixing of air with the gas prior to entering the burners for combustion).

3. Air inlets to the redryers.

4. Air inlets for conveying and cooling the powder after it leaves the dryer (use Item D24—Product Removal & Conveying Equip. or Item D27—Powder Cooling System to show any needed recommendations regarding these filtering systems).

Check that each of the air sources is properly filtered. Also, check for unfiltered air leakage into the drying system. For instance, check for leakage at openings for spray nozzle insertion. When unfiltered air enters the dryer at the spray nozzle pipes, recommend correction of the condition according to the recommendations of the dryer manufacturer. Do not attempt to advise management how to accomplish this. In actual practice, correction will simply consist

of blocking the opening, or providing for filtration of air that enters at this point. However, this may be done in many different ways, some of which may affect proper operation of the dryer system. The methods of correction, therefore, should be the prerogative of management and the dryer manufacturer.

Examples:

D20. — Arrange with the dryer manufacturer to prevent entrance of unfiltered air around the spray nozzles (C).

— Prevent the entrance of unfiltered air through the unused spray nozzle openings (A).

Also check for gasketing of the filter frames, poor fitting doors or parts, spray nozzle pipe openings, poor fitting joints on powder conveying pipes, broken flexible sleeves, etc.

E. Filters—Construction and Filtering Efficiency.

The *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-* outlines requirements for filter materials and for filter efficiency. Inspectors should be familiar with the applicable sections of this 3-A document. Notice particularly that different filter efficiency requirements and tests apply for air to be heated (over 240° F) and for air not to be heated (under 240° F).

It is a USDA requirement that filters meeting these 3-A requirements be used on all spray drying systems, including those installed prior to development of the 3-A criteria. When noncomplying filters are noted, recommend replacement with filter systems that meet 3-A requirements.

Any filter that meets the 3-A materials and efficiency requirements is satisfactory. Where there is doubt about compliance, recommend that management obtain certification from the filter manufacturer.

F. “Absolute” Filters—General Information.

The term “absolute” is used informally to denote a class of very high efficiency filters guaranteed to remove 99.97 percent of airborne particulates of .3 micron size. Their efficiency far exceeds the 3-A cold air requirement and is such that even bacteria are removed from the filtered air.

As a general rule, when absolute filters are used, they should be located downstream of fans, radiators, etc., so that unfiltered air or other contaminants do not have a chance to enter the filtered air from leaks in the system. With the fan located upstream of the filter, any leaks in the system will permit escape of some filtered air, but the positive pressure will not allow entrance of unfiltered air. For installations which handle humid air, special frames are available (usually made of exterior grade plywood) to withstand 100 percent relative humidity conditions.

Absolute filters far exceed the minimum requirements and you should neither recommend nor discourage their use. This should be an option of management, based primarily on their evaluation of environmental conditions and history of salmonella control in the finished product. Under some conditions, use of absolute filters may be indicated.

Item D21—Dryer Air Heating System (58.220a).

When the *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-4* took effect in November 1998, it changed the material requirements for air contact surfaces. The main change was to require stainless steel for all air contact surfaces, except for: flexible connectors in air to be heated and exhaust air contact surfaces; burners; steam and other heat transfer coils; exhaust fans; and dampers in exhaust air contact surfaces. Therefore, all fans between the final filter and the dryer chamber shall be stainless steel. In an additional change, motors, belt drives, and bearings are not permitted in the air stream after the filters. Dryers constructed before November 1998 that meet the 3-A Accepted Practices then in effect are grandfathered.

Heating of process air for drying purposes is usually accomplished by one or more of the following methods:

A. Direct Gas Firing.

In direct gas fired dryers, precautions should be taken to assure complete combustion of the fuel (usually natural gas or propane). This is achieved by 1) maintaining proper gas pressure, 2) proper mixture with air if a premix is burned, 3) keeping all equipment components in good repair, and 4) careful adjustment of the burner. Proper combustion is indicated by flame color and tests of the combustion residue. Incomplete combustion can cause flavor and quality problems with the dried product.

B. Finned Radiators, Steam Heated.

Sometimes “waste” steam or hot water is used in these radiators to partially heat the air prior to a gas burner. Some dryers use steam to accomplish all the heating. However, the air temperature achievable by steam radiator heating is limited and this in turn affects dryer capacity and cost of operation.

C. Finned Radiators—Liquid Heating.

Since the air heating is an indirect procedure, the recirculated hot liquid may be heated by a direct fuel oil burner, there is no sanitary objection to this.

In the event of a radiator leak, there could be danger of product contamination under certain conditions. However, this can be minimized by provision of a downstream sump and alarm system or other mechanism to detect fluid leakage.

D. Direct Oil Firing.

Although utilized on dryers for many food products, direct oil firing is not considered suitable for drying dairy products, because of their delicate flavor and tendency to absorb foreign odors.

E. Indirect Heating-any Fuel.

This procedure involves the use of a heat exchanger, so that the kind of fuel has no sanitary concern. However, construction and maintenance of the heat exchanger have many sanitary aspects. The *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-* does not have any guidance in this regard—because such heat exchangers are now rarely used. If it becomes necessary to use them because of natural gas shortage, it is likely that 3-A guidance will be developed.

F. Regeneration (Air-to-Air or Air-Liquid-Air).

Exhaust air from the dryer may be used to partially heat incoming process air by means of a heat exchanger. This heat exchanger can be air-air or air-liquid-air. If the two streams of air are separated by the heat exchanger there is no direct sanitary concern. However, the system and surrounding areas should be relatively free of fines or caked powder.

On dryers built after November 1998, the heat exchanger shall be designed so that it can be cleaned, either by recirculation or by hand cleaning. In addition, if the heat exchanger is located after the final filters, processing air contact surface requirements apply for materials and fabrication (stainless steel construction with continuous welds and accessible for cleaning).

If the two air streams are not completely separated, assign the INELIGIBLE status (category A deficiency) and notify the National Field Office.

Item D22—Drying Chamber (58.220a, 58.242, 58.246).

Show the make of the dryer on the report.

New or replacement drying systems or portions of systems replaced shall comply with *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-* . Inspect new or remodeled spray drying equipment accordingly.

Note:

> Do not expect to find a 3-A symbol on a spray dryer. The applicable 3-A document is an “Accepted Practice” for a spray drying system; it is not a “Sanitary Standard.” The 3-A Symbol Council makes symbol authorization only when there is a 3-A equipment standard.

Special covers for footgear and clean clothing shall be worn when entering the dryer (see the guidelines for Item D29—Dryer Dry Cleaning Methods).

Periodically, arrangements shall be made to inspect the interior of all dryers for unsatisfactory conditions regarding sanitation, construction and repair.

If due to production schedules a dryer is not available for inspection during the survey, document the facts on the report. If it is not available the next survey, the highest status for the affected codes shall be APPROVED 3-MONTHS. Show the reason for the status assignment and the date of the survey the dryer was last inspected on the report. If the dryer cannot be looked at for three consecutive surveys, assign the INELIGIBLE status. We will attempt to cause as little imposition to the plants as possible by allowing the PROBATIONARY 10-DAYS status to be assigned in lieu of the INELIGIBLE status, provided they can make the equipment available within that period.

With respect to dryer sanitation, various procedures for cleaning are acceptable, depending upon the construction differences of equipment. Many drying chambers are the cone type and they are cleanable by wet methods only. For box dryers designed mainly for dry cleaning, the frequency of wet cleaning should be determined by the condition of the dryer chamber. Under normal operating conditions, dry cleaning procedures may be used satisfactorily over an extended period of time. However, when there is improper spray operation or other dryer malfunction, wet cleaning is necessary. When wet cleaning is performed, it shall be done thoroughly. Make careful inspection for caked powder due to inadequate wet cleaning.

Although main drying chambers of some dryers are routinely wet cleaned, subsequent collectors, cooling and conveying systems are often not designed to allow routine wet cleaning. It is, therefore, important to prevent splashing or movement of wet vapors into these “dry” areas during wet cleaning of the main chamber. This can be achieved with valves, shutoff plates on ducts, making a complete disconnect, by using a polyethylene liner over openings, etc.

Where a plant is drying buttermilk or whey using the same dryer and equipment as for NDM, such drying should be done following the day's production of NDM. Before returning to drying NDM, the dryer and equipment shall be thoroughly dry cleaned, including brushing of shaker bag type collectors, if used. Bag collectors using reverse pulse cleaning may require extra, repetitive pulsing to dislodge as much product as possible from the surface of the bags. Adequate measures should be taken to prevent adulteration of one product with another. This usually involves the common practice of drawing off a number of bags of NDM at the start of the run. Wet cleaning shall be done when unsatisfactory conditions (burn-on, excess fat or powder on walls, etc.) do not result in adequate dry cleaning. This procedure shall also be followed when alternating between approved products and unapproved dairy products.

If the plant is drying unapproved nondairy products, contact the National Field Office.

Special Considerations for Lactose Equipment.

1. Product contact surfaces upstream from the point where the dairy fats and solids are removed from the mother liquor shall meet the requirements for sanitary design, materials, and fabrication of dairy processing equipment as outlined in this guideline. For example, the point of dairy fat and solids separation in a lactose centrifuge occurs as the mother liquor passes through the basket screen.

2. Product contact surfaces from which liquids may drip, drain or be drawn into contact with the separated dairy fat and solids shall also meet the requirements for sanitary design and construction of dairy processing equipment as stated in item 1. above. This may include some surfaces downstream from the point where the dairy fats and solids are removed from the mother liquor.

3. Surfaces in contact with lactose crystals **and** from which liquids will **not** drip, drain or be drawn into the dairy by-products may be constructed using the following criteria:

    a. Equipment shall be constructed of nontoxic material meeting applicable FDA regulations. The materials shall be resistant to corrosion, pitting and flaking. The use of stainless steel is recommended but optional.

    b. A 2B mill surface finish is accepted on lactose contact surfaces made of stainless steel. Surface finishes equivalent to a number 4 finish are not required.

    c. All welds should be continuous, relatively smooth, and free of pits, folds and snags. Where necessary for functional reasons, skip welds can be used. Grinding and polishing of welds is not required.

    d. Minimum radii of internal angles of less than 135 degrees are not required. However, it is recommended that sharp corners be avoided.

    e. Bolted construction and exposed threads are acceptable on dry lactose applications.

Item D23—Second Stage Drying Equipment (58.220c).

Dryers for nonhygroscopic whey usually reduce the moisture to approximately 12% in the first stage spray drying. Then the moist powder is conveyed to a second stage drum-type dryer. The conveyor is usually belt-type and moves slowly to permit more lactose crystallization and conversion to the nonhygroscopic alpha-lactose hydrate form (by taking up one molecule of water of hydration). Use this item to cover inspection of such drying equipment. Use Item D24—Product Removal & Conveying Equip. to cover the conveyor (show NA if not present).

A. Fluid Bed.

Some redryers are the fluid bed type, whereby the partially dried product moves over a perforated plate or “bed” while hot air comes through the perforations from below. Powder movement on the bed is induced by reciprocal mechanical motion, vibration, or by air flow from angled perforations. These units are often equipped for mechanical cleaning. Inspect for sanitary construction and cleanliness, particularly of the bed plate, inspection doors, any gasketed joints, and appurtenances (any deficiencies regarding the fluid bed air supply or filters should be covered under Item D20—Dryer Air Supply).

B. Rotary Drum Dryers.

These systems shall be made of stainless steel or equally corrosion-resistant metal and constructed following the applicable principles of the *3-A Accepted Practices for Milk and Milk Products Spray Drying System, Number 607-* . Check particularly for method of attaching vanes inside the revolving drum.

The drum dryer will have a separate air filter and heating system plus equipment for removing, conveying and collecting the product. In checking these systems, follow the applicable guidelines that apply to spray drying systems and list the recommendations under the corresponding item number.

Note:

> On dryers used exclusively for lactose see “Special Considerations for Lactose Equipment” under Item D22—Drying Chamber.

Item D24—Product Removal & Conveying Equip. (58.220a, 58 221, 58.239).

Each dryer should be operated to produce the highest quality dry product consistent with the most efficient operation. The dry products shall be removed from the drying chamber continuously during the drying process.

Use this item for equipment for conveying the powder from the dryer by air, vacuum, augers, or mechanical type pusher devices. Product contact surfaces for such equipment shall be made of stainless steel, aluminum, or equally corrosion resistant material. Iron or galvanized iron product contact components shall not be used. If noted, recommend replacement. Pay particular attention for black iron ducts with stainless steel cladding on the exterior.

Small diameter pipeline fittings shall comply with the requirements of the applicable *3-A Sanitary Standards*. If the fittings are larger than 6-inches in diameter, they shall meet the general criteria of, and be accepted by, the Dairy Grading Branch. These large diameter ducts shall be made of stainless steel and have sanitary construction. Flanged joints shall form tight, pinch seals with the gaskets. Criticize crevices on the product contact surfaces created by

rounded flange components. The ducts shall have sufficient joints to permit adequate cleaning and inspection of the product contact surfaces.

Inspect all ducts for cleanliness. A light, dusty condition is acceptable. If caked or wet product is observed, recommend that the entire system be wet cleaned. Ducts may be designed to be frequently cleaned with spray devices. Spray devices that are permanently installed in the ducts shall be of sanitary design. Ducts utilizing mechanical cleaning are to be properly pitched to assure complete drainage of cleaning solutions.

Point out badly dented conditions on the conveying equipment that may cause difficulty in cleaning. Recommend correction. The use of tape to seal cracks, and improperly gasketed or misaligned joints in product or air ducts is unacceptable. When these conditions are observed, recommend repair or replacement of the pipeline junctures.

Flexible connectors shall be the smooth-sided type and shall be in good condition, clean, and free of cracks or tears. Flexible connectors that are used in the vertical position may have corrugations that have a radius of not less than ½ inch and are no deeper than their width. If cracks, tears, or holes are noted, recommend replacement. If caked or encrusted product is observed, recommend that the connectors be removed and thoroughly cleaned.

When the powder removal system utilizes cables, the pulley and cable portions that are on the dryer exterior shall be suitably enclosed. This may be accomplished with stainless steel construction, with or without detachable covers. The entire enclosure should be easily removable or should have covers or doors to allow easy access for periodic cleaning. When such protection is not provided make an appropriate recommendation.

A. Pneumatic Conveying Systems.

Pneumatic conveying systems shall comply with the *3-A Sanitary Standards for Pneumatic Conveyors for Dry Milk and Dry Milk Products, Number 39-* . Check the system air supply. The plant must be able to present letters of certification that the filters being used meet the requirements of the standards. Disassemble the rotary valve and sections of the conveying line to evaluate fabrication and sanitation. Check the system for defective gaskets and leaks where unfiltered air may be drawn into the system or where the product may be expelled into the plant environment.

Rotary fluidizing valves (star valves) used with pneumatic conveying systems shall be reviewed and accepted for use by the Dairy Grading Branch. Iron or galvanized iron product contact surfaces shall not be used. The rotary valves that have been reviewed and accepted for dry applications have been designed so that the rear, drive end plate does not have to be removed when the valve is disassembled for wet cleaning. The design may include a gasket at the juncture of the rear end plate and the valve body, or a fully welded and machined body. Therefore, for plants using the USDA accepted rotary valves it is not appropriate to recommend removal of the rear end plate for manual wet cleaning on the plant survey report.

Fans that are located within the product contact surfaces shall be made of stainless steel and have sanitary construction. Refer to *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-* or *3-A Accepted Practices for Instantizing Systems for Dry Milk and Dry Milk Products, Number 608-* . Iron, galvanized iron, or painted iron fans are unacceptable. Recommend replacement when fans made of material other than stainless steel are used to convey human food products or fines recovered for human food. The fans shall be of a construction that will not draw unfiltered air into the product stream. Check the annular shaft openings for proper sealing.

B. Mechanical Conveyors.

When the plant survey coincides with wet washing of the dryer system which uses auger conveyors, arrange with management for dismantling of the augers to determine if the hollow interior is properly blocked off at the point where drive connections or couplings are made. When applicable, recommend proper plugging of the hollow interior. Such remodeling work should be done according to the dryer manufacturers recommendations (usually accomplished by driving in a close fitting stainless steel plug and flooding the outside surface with solder).

Mechanical conveyors shall comply with the *3-A Sanitary Standards for Mechanical Conveyors for Dry Milk and Dry Milk Products, Number 41-* check the following items:

1. Belts shall be endless (no mechanical splices) and product contact surfaces shall be made of food grade rubber or plastic materials that meet the applicable 3-A Sanitary Standard.

2. The conveyor shall be fully enclosed, including covers over the loaded portion and also around the empty return portion. Cover sections shall have hinges of sanitary construction (no piano type hinges) or be of such size that they can be easily handled.

3. Product contact surfaces except the belt shall be stainless steel or equally corrosion resistant metal under conditions of use, including pulleys, idlers, slide pans, and covers. Nonproduct contact surfaces of the frame need not be stainless, but if made of coated or painted iron, check that they are clean and free of rust or peeling paint.

4. Lubricated bearings shall be located outboard. Protection shall be provided for frame slots needed for adjustment of belt tightness. The annular space around the shaft shall also be protected to prevent the entrance of contaminants.

5. Check for sanitary construction of inlet and discharge assemblies.

6. Open cell foam rubber is not suitable for gasket material because of its sponge-like character. Gaskets shall be solid and shall meet either the *3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-* , or the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces in Dairy Equipment, Number 20-* .

7. Means of safe access are required to any portion of the conveyor that is not easily accessible from the floor level (adjacent catwalk and railing, movable stairway and platform, etc.).

8. If air purge seals are used, the air supply shall comply with the requirements in the *3-A Accepted Practice for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-* except that the sanitary check valve is not required and plastic air hoses may be used instead of stainless steel.

C. Vacuum Conveyors.

Occasionally vacuum conveyors may be used to draw and send products from bulk containers to blending or packaging equipment. Check that the equipment used for this method is of sanitary design. If conveying is done by means of an unloading lance or probe that allows entrance of unfiltered air recommend the INELIGIBLE status (category A deficiency). Check that the unloading lances and probes are properly cleaned and stored in a suitable sanitary cabinet or container when not in use.

Item D25—Dryer Collectors (58.221).

Primary or main collectors for drying systems are basically of two general types: bag filters or various modifications of the centrifugal cyclone principle.

A. Cyclone Collectors.

Inspection ports or doors on cyclone type collectors should be opened for inspection of interior surfaces and any off conditions should be noted on the report. Some cyclone type collectors are set up for spray ball cleaning with solution recirculation. In such case also be sure to check for proper cleaning of the interior surfaces of the circular extension into the cyclone which takes exhaust air from the center of the cyclone.

Cyclone collectors require air lock devices to continuously remove the collected powder without loss of the vacuum inside the collector. The most common type of air locks are rotary star valves (see the guidelines for Item D24—Product Removal & Conveying Equip., paragraph A) or double acting flapper valves. When inspection is made after a wet cleanup of the equipment, be sure to inspect these units for condition and sanitation.

B. Bag Houses.

Bag houses, whether separate or integral to the dryer shall meet the *3-A Sanitary Standards for Bag Collectors for Dry milk and Dry Milk Products, Number 40- .*

Use a large floodlight for inspecting interior surfaces of the bag house. Be sure to check for cracks, especially in the vicinity of any vibrating devices. When cracks are noted, recommend welding and smooth finishing of the repaired areas. Many welds might indicate metal fatigue

that would make successful repair difficult. In such instance, recommend the entire stainless steel section be replaced.

Some bag houses clean the bags by air reversal during operation from a timed sequence programmer. There shall be access to allow inspection of the interior of the air manifold. All welds shall be continuous but do not need to be polished and a filter shall be provided as close as practical to the manifold. Also, open the inspection port or doorway and check the condition of bags from the outside. It is not necessary to have bags removed for additional inspection.

The interior of the bags, such as used on Rogers or Walker dryers should be inspected periodically with a flashlight to determine if the bags are being brush cleaned properly and if bags are in good condition.

C. Wet Collectors.

Any new or replacement wet collectors that save the fines for use as human food shall meet the *3-A Sanitary Standards for Wet Collectors for Dry Milk and Dry Milk Products, Number 43- .*

Some wet collectors are used to remove fines from dryer exhaust air for recovery as human food. These wet collectors spray recirculated fluid product through the escaping exhaust air. To control bacteria, the fluid product is kept hot by recirculation through a heater. Nevertheless, bacterial development can be a serious problem in the foam, or in the fluid if thermophilic bacteria are established during long runs, or if sanitation is poor. Inspect such units carefully for condition and sanitation, including the collector and sump surfaces, the level control, spray pipes, heater, recirculating pump, and related pipes and valves. Also check that the exhaust stack is covered during shutdown periods. This is usually performed manually (stairway access to the rooftop is usually provided from the top of the drying cone or the wet collector).

Other collectors also use fluid product to collect the fines by mixing a liquid spray with the exhaust air in a specially constructed duct just ahead of the collector, by wetting all interior surfaces of the collector, and by a final spray through the air being exhausted from the stack. The liquid is usually at about 110° F, but is not recirculated; after a single pass, it is piped to the pasteurizer preheater prior to the evaporator. The exhaust stack is equipped with a sanitary cover that closes automatically when the unit is shut down. Cleaning of the collector is accomplished through the special sprays and jets which wet the interior surfaces during regular operation. Inspect all product contact surfaces carefully for condition and sanitation, including the stainless steel fan located ahead of the venturi section.

During recent years, some additional wet type collectors have been developed and are installed in dairy operations. Manufacturers of this equipment have consulted with USDA about materials and fabrication for the initial installations. Further review during actual operations is necessary to determine cleaning and operating performance. Contact the National Field Director for guidance when you encounter wet collectors that are being operated for the human food recovery of product fines.

Collectors for human food, regardless of type, shall be located in a suitable room or area within the plant. See Item D43—Waste Products Handling for inspection guidance for collectors that recover product for animal feed or other than human consumption.

Item D26—Dryer Exhaust System (58.220a).

The *3-A Accepted Practices for Milk and Milk Products Spray Drying Systems, Number 607-* requires a self-closing head to be installed at the terminal end of all exhaust-to-atmosphere ducts or stacks for process air. Some dryers have two or more exhaust stacks. This self-closing cover requirement also applies to such separate exhaust ducts from collectors, including either cyclone or bag type.

Means of access should be provided to the self-closing covers to permit the periodic cleaning and maintenance needed for their proper operation. The roof area around the exhaust stack(s) should also be inspected and any unsatisfactory conditions noted on the report. Roof areas near the exhaust stack should be self-draining. Sloped cleanable roofs should be recommended for new construction and when there is excessive pooling of water coupled with dirty conditions from stack loss at existing dryer installations.

To meet pollution control requirements, management may install devices in the plant or on the roof top to reduce noise or product loss in the exhaust air. If such devices are causing sanitation, bad odor, insect, or dust control problems with the drying operation, report the conditions fully for follow-up by the National Field Director.

Note:

> Open roof top location is not satisfactory for collection systems that recover the product for human consumption.

If the dryer exhaust system has an animal feed collector, either the wet or dry type, see Item D43—Waste Products Handling.

Item D27—Powder Cooling System (58.220a, 58.222).

Cooling of dry finished products in most systems is accomplished by metering the hot product into a stream of moving cold air. The mixture is then separated in a cyclone separator and powder is discharged through an air lock device. Exhaust air from the cyclone may contain some fines and is often returned to the drying chamber or primary collector. Air movement through the cooling system on modern units is induced by a sanitary stainless steel fan located separately from the cyclone that delivers the exhaust air back to the drying system. Many older cooling systems, however, have fans mounted vertically as an integral part of the cyclone collector. Because of their weight and location, such fans are extremely difficult to dismantle for cleaning. When drying systems are replaced or when major remodeling takes place, encourage provision of a separate sanitary stainless steel fan.

Since the cooling system handles only dry product, the related piping, cyclone, and fan usually do not require frequent cleaning. When the rest of the dryer system is wet washed, there should be segregation of the cooling components to protect them from water splashing and humid air. This can be accomplished by making a physical break at the point where powder is picked up and where exhaust air and fines are returned to the system. Another alternative is to cover the open ends of such pipes with polyethylene or to have them suitably plugged by other means. Except for checking that these precautions are followed, there should be no need for checking interior surfaces of the powder cooling system (more detailed inspection of powder cooling systems may be indicated on plant survey follow-ups made in connection with salmonella problems).

To improve efficiency of a powder cooling system, sometimes provision is made for cooling the air by water or mechanical refrigeration before the powder pickup point. Most of these air cooling units have coil and fin type construction and may be very difficult to clean. Remove the inlet air filter and check the exposed surfaces of the fins and if possible also check the downstream side of the fins. If not clean, try to determine why (an inefficient air filter, filter not properly gasketed, unfiltered air leaks into the system, powder conveyed backwards by air currents during shutdowns, etc.). Recommend corrections as may be applicable.

If there are deficiencies with the air inlet filter, recommend changes to comply with the requirements of 3-A Accepted Practice.

As an alternative to mechanical refrigeration of the air, some new dryer systems employ two-stage cyclone cooling using unrefrigerated room air or air directly from the outdoors. These two-stage systems will reduce the product temperature much closer to the ambient temperature so that satisfactory powder cooling performance below 110° F may often be achieved without refrigeration (depends greatly on the climate in the area).

Some special dry products are cooled with jacketed equipment. This is satisfactory when it is properly constructed and when operated to prevent moisture condensation on product contact surfaces. If air is not used for cooling the product, describe the cooling system and, if necessary, call the National Field Director for inspection guidance.

Item D28—Storage Bins & Conveyors (58.226, 58.246).

Storage bins shall be constructed with welded seams from stainless steel, aluminum or other equally corrosion resistant material. The interior surface shall be relatively smooth and easily cleanable. Unpolished 2B mill finish that is free of defects is satisfactory. Seam welds shall be polished to be at least a number 4 finish. Although frequent cleaning is usually not necessary if the storage bin is kept closed and dry, all product contact surfaces shall be easily accessible for cleaning, or there shall be satisfactory provisions for mechanical cleaning.

A storage bin is usually equipped with a top vent to allow air to escape and enter during the filling and emptying operations. Such vent openings shall be equipped with a suitable filter. The filter has a dual purpose, to prevent escape of product dust, and to filter air entering the bin. Usually, these functions are best handled by filter sock or special filter cartridge units.

Filter media that meets the materials and efficiency criteria of the 3-A Accepted Practices for Spray Drying System may be encouraged, but failure to provide complying filters should not be considered a deficiency (the scope of 3-A Accepted Practice for Spray Drying Systems terminates at the point the final product enters either the packaging systems or storage for further processing).

Use this Item for any conveyors for transporting product out of the bin to the packaging equipment. See the guidelines for Item D24—Product Removal & Conveying Equip.

Item D29—Dryer Dry Cleaning Methods (58.225, 58.246).

If possible during the survey, check personnel practices and procedures for dry cleaning the dryer. Areas to observe include the following:

1. Proper footgear and clothing shall be used in the dryer.

2. Personnel shall not walk on floor surfaces outside the dryer with this special footwear.

3. Proper tools and brushes shall be used and they shall be properly stored when not in use.

4. Check the effectiveness of the dry cleaning.

5. If the product collected by dry brushing is off-quality, it should not be mixed with the regular production, but should be packaged separately for appropriate disposition.

In applicable box type dryers, special boots or shoe covers shall be used for entering the drying chamber. The plant should provide sufficient number of rubber or plastic boots, or disposable shoe covers so that clean, sanitized footwear will always be available when entering the dryer chamber is necessary. The clean boots shall only be used for this purpose and shall be stored in a special cabinet. Recommend that boots be of a distinctive color (preferably yellow or white) so that use of the boots can be easily monitored by plant supervisors. Using cloth shoe covers is also satisfactory if they are cleaned and sanitized after each use and the plant maintains clean cloth boots available at all times. When these are found not clean make appropriate recommendations.

Special clean clothing shall be provided when the dryer is entered for dry cleaning. Miscellaneous equipment (brushes, brooms, etc.) shall be maintained in a clean and sanitary condition and, when not in use, shall be stored in a suitable metal cabinet, preferably constructed of stainless steel. The inside of the cabinet should provide a place to hang brushes, scrapers, and vacuuming tools. In addition, shelves are necessary for storing special footgear. A sanitary step should also be provided for changing into clean footgear before entering the dryer. Brushes used in the dryer should have stainless steel or plastic handles and bristles should be encased in rubber or plastic heads. Hand tools, such as scrapers, brushes, squeegees, shovels, etc., should also be of sanitary construction. The use of this clothing, footgear and equipment shall be restricted to interior dryer work.

Item D30—Vacuum Cleaner (58.230).

Each dry milk plant shall have a heavy duty industrial vacuum cleaner. The vacuum cleaner can be either the portable or stationary central type. The material removed from the collectors of the vacuum system shall be properly disposed of to destroy any insects or salmonella organisms that might be present (use of tied plastic bags or other tight containers to handle such waste is satisfactory). Emptying and cleaning of portable type vacuum cleaners shall not be done in the dryer or packaging rooms.

A central vacuum system, properly engineered and installed, has some advantages over the individual portable vacuum cleaner. Vacuum plug-in stations may be placed at various convenient locations to allow improved housekeeping and easy cleaning of hard-to-reach areas. When a central vacuum system is used, the exhaust air for the vacuum pump shall be directed outside the plant and not near any air intake to the plant. Check this air exhaust area, and when found unsatisfactory, make appropriate recommendations. The central type system should preferably be located in a separate room with a separate entrance from the outdoors to keep personnel traffic to a minimum. Material collected should be considered as "Salmonella suspect" and be handled accordingly. Personnel traffic into the room should be restricted. The room should also have a separate exhaust fan to prevent dust spreading from the room during emptying of the collector units.

Item D31—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Proper housekeeping and dermestid insect control is enhanced with frequent use of the heavy duty vacuum cleaner. Special attention should be given to ducts, switch boxes, conduit boxes, motors, conveyors, cabinets, pipes, lights and tops of beams and supports.

Packaging

Item D34—Room Construction (58.126, 58.211).

See the guidelines for Item A1—Room Construction.

A separate room or area shall be provided for filling containers and construction shall be in accordance with §58.126 (i.e., a processing room or equivalent). Generally a separate room is required. A separate area may suffice for low volume drying operations or for dry products which are not very dusty. However, if packaging in an unenclosed area is causing dust drift and housekeeping problems in other parts of the plant, recommend provision of an enclosed packaging room.

The number of electrical switch boxes in this area should be kept to a minimum. Control panels shall be 1) mounted a sufficient distance from the walls to facilitate cleaning, 2) satisfactorily sealed to the wall, or 3) mounted in the wall and provided with tight fitting removable or hinged covers to facilitate cleaning.

Only packaging materials that can be used within a day's operations should be kept in the packaging area. These materials shall be kept on tables or metal racks at least six inches off the floor. Unnecessary fixtures, equipment, or false areas which may collect dust and harbor insects, should not be allowed in the packaging room.

Properly trapped floor drains shall be provided and the floors shall be pitched to the drain points. While the dry products packaging areas may not require regular or frequent wet cleaning, floor drains are required for times when wet cleaning will be necessary. Because of their infrequent use, floor drains should be equipped with a removable cap or a seal. Alternately, the trap can be filled with a nonevaporating liquid. Open drains shall not be located in the vicinity of air intakes for processing or conveying air.

Item D35—Lighting & Ventilation (58.126d, e, 58.211).

See the guidelines for Item A2—Lighting & Ventilation.

Item D36—Dust Control (58.211, 58.230).

An adequate exhaust system shall be provided to minimize the accumulation of product dust within the packaging room, and where needed, a dust collector shall be provided and properly maintained to keep roofs and outside areas free of dry product. This can usually be best accomplished with an exhaust system which maintains negative pressure in the packaging room. This will prevent dust from drifting into processing room or warehouse, thereby minimizing housekeeping, insect and bacterial problems. Vertical duct work in exhaust systems is desirable to allow cleaning and inspection. Rectangular or square shaped ducts which are mounted horizontally should either be sealed on both surfaces against the ceiling or wall,

whichever is applicable, or be mounted to allow access for periodic cleaning of the ledge on top.

The room exhaust system may optionally be provided with a filter or dust collector to minimize product loss at the exhaust outlet. There are some drawbacks to filtration of the room exhaust air. The amount of dust may plug up conventional filters. More elaborate dust collection systems may require considerable maintenance, cleaning, and surveillance for dermestid insect control.

A few companies hold the view that the food packaging room should be pressurized with fresh filtered air. Occasionally therefore, you may find a packaging room with static air flow condition or a very slight positive pressure. This is satisfactory provided there is no evidence of dust drifting from the packaging room into processing areas or warehouse. When dust drift is found, recommend that the plant make corrections or provide negative pressure conditions in the packaging room.

Item D37—Sifter (58.224, 58.246).

When new sifters are installed, they shall meet requirements of the *3-A Standards for Sifters for Dry Milk and Dry Milk Products, Number 26-* . In the production of nonfat dry milk and dry whole milk, it is customary industry practice, and a USDA requirement, that the product be sifted at some suitable point between the dryer and the final package.

Recommendations for screen mesh size to be used for various dairy products are outlined in Appendix H of the 3-A Sanitary Standard. Although stainless steel woven mesh is most commonly used, the 3-A Sanitary Standards also provide for optional use of cotton, linen, silk or synthetic fibers for screening surfaces.

Routine cleaning of the sifter by dry brushing or vacuuming is a satisfactory practice. When inspecting the sifter, also check for proper gasketing, screen breaks, condition of balls and ball trays, etc. Wet cleaning should be performed when needed. Frequency will depend somewhat on product sifted, humidity conditions in the room, etc. After thorough washing, all parts should be rinsed with hot water and allowed to air dry before reassembly.

In most cases oversize “screenings” or “tailings” shall be promptly and continuously discharged from the sifter. If such removal is prevented or impeded by restricting baffles, vibratory action, or other design considerations, make recommendation for correction. The tailings material is usually collected into a container below the oversize spout of the sifter. It is important that there is a tight connection between the spout and the container receiving such material to prevent any possibility of a back-draft drawing unfiltered air or foreign particles into the sifter (such back-draft may be induced by air leakage through the airlock device under a cyclonic collector which feeds the sifter). The container shall be emptied daily and maintained in a sanitary condition. A separate clean washable container would be satisfactory, or a bag (or poly liner) may be clamped or tied to the sifter oversize spout. The bag would be discharged along with the tailings material and be replaced with a clean bag. Floor sweepings from powder spillage or cleanup should not be placed into this container. The tailings container for dry milk or NDM

operations should be marked “Not for use as human food” or otherwise clearly marked to distinguish it from human food containers (see the guidelines for Item D43—Waste Products Handling).

As a general rule, sifter “screenings” or “tailings” are considered as waste powder and should not be used for human food. There are exceptions to this practice, depending on the equipment or the manufacture of certain products. For instance, particle sizing operations in manufacture of instant NDM, dry whey manufacture by spray process, etc., whereby sifter oversize material is routed to sizing rolls, hammer mill, reprocessing, etc., for eventual human food use. In the case of filtermat dryers, the oversize material may be returned to the main drying chamber, provided unfiltered air is not admitted, and the process is handled in a sanitary manor.

There is no objection to such human food use, provided that the oversize food particles are not excessively scorched, “off grade,” unwholesome, or mixed with other extraneous material obtained from the screening process. In case of doubt about proper disposition of screenings from special food products, examine the process, the intent of the screening procedure, the condition and appearance of the screenings, and also review the company surveillance and testing of the screenings. When necessary, call the National Field Director for guidance.

In the production of dry whey, it is usual practice to install a hammer mill prior to the sifter. When the hammer mill is equipped with a fine screen (actually a perforated plate), all the resulting whey particles will pass through a subsequent sifter screen with no “overs.” Under these circumstances, a sifter would serve no useful purpose and may be omitted.

Accordingly, if a dry whey hammer mill has a screen or perforated plate with holes equivalent to 20 mesh (.033 inch diameter holes), provision of a downstream sifter should be considered as an option to be decided by management.

Hammer mill screens are usually stamped with hole diameter or “mesh size.” The Fitzpatrick mill screens for instance, are stamped at one end with eight digits. The first four concern the model number and may be disregarded. The last four digits denote mesh size as follows:

0016 indicates 16 mesh
0020 indicates 20 mesh
0024 indicates 24 mesh

As with sifters, proper performance of hammer mills requires good condition screens which are properly seated so there can be no passage of oversize product. These points should be checked during surveys when practical.

This same principle of using a hammer mill in lieu of a sifter is applicable to all roller dried products. It may also be applicable for certain other spray dried products. In such instances where the manager wishes to operate without a sifter, gather all relevant information and telephone the National Field Director for guidance.

Item D38—Bag Filler & Scale (58.128m, 58.229).

Check that filling equipment is of sanitary construction with all parts accessible for cleaning. New or replacement equipment shall comply with *3-A Sanitary Standards for Equipment for Packaging Dry Milk and Dry Milk Products, Number 27-* .

The design of many filling systems includes a pressure relief air displacement pipeline from the filler head of the packaging unit. This pipeline is sometimes connected back to a section of the drying system which is under negative pressure (such as a cyclonic collector, or pneumatic powder conveying line). Under these conditions, unfiltered air from the packaging room may be drawn into the drying system whenever containers are being changed at the filler heads. Such admittance of unfiltered air into the drying system is unsatisfactory. Recommend correction. Following are some alternatives for correcting the problem which may be suggested to management:

1. Valves and mechanical actuating linkage can be provided to automatically shut off flow in the vent line from an individual filler head during periods when a container is not clamped in place.

2. For small capacity dryers, it may be possible to simply remove the pipeline and to install a filter or small cloth sock on the vent at the filler head for air displacement as the container is being filled.

3. The vent pipeline may be connected to the suction side of the dryer fan which exhausts directly to atmosphere. A throttle valve may be necessary in the pipeline to regulate the vacuum and prevent excess powder from being drawn out. When this method is used, the pipeline should be in sections with removable fittings to allow dismantling for periodic cleaning.

4. The vent pipeline may be connected to a central vacuum system (dust collector) or to a small portable vacuum unit that exhausts outdoors (product so recovered is not suitable for human food).

Sintered material, used as deaerating probes, can be either plastic or stainless steel (with stainless steel the most common). This material is formed under high temperatures and pressures. This process produces a porous material that is used to draw the excess air out of the powdered milk bag after filling. Because of the nature of this material, these probes cannot be adequately cleaned. Therefore, it is a USDA and a 3-A requirement that the probes be kept dry and that they are discarded after they become plugged. This does not preclude the practice of removing the probes temporarily and then reinstalling them into the packaging machine (for example, the plant may have a separate set of probes for each product). If you find a situation where a plant is attempting to wash and then reuse the probes, assign the deficiency to category B.

If the plant has more than one set of probes, or, if the probes are reinstalled after wet washing the packaging machine, check that the extra set(s) are handled and stored as outlined in

Appendix I in the *3-A Sanitary Standards for Equipment for Packaging Dry Milk and Dry Milk Products, Number 27-*.

Appendix I recommends that prior to handling the probes, hands should be washed, sanitized, and dried. In addition, clean, disposable, sanitary gloves should be worn. The probes should be stored inside a gasketed, stainless steel cabinet that has a rack or shelves. Alternately, the probes can be stored inside a cleanable or single use container (see Appendix I for more information). This guidance is provided because the probes will be reinstalled throughout their service life without being washed or sanitized. Therefore, it is imperative that they are protected from contamination while removed from the machine.

During the survey, check that the storage cabinet or container is sealed and located in the packaging room or other processing area. Acceptability of the storage conditions will depend on whether the probes are protected from contamination. If conditions exist where the probes can become contaminated (but contamination has not been observed), assign the deficiency to category C. For example, the probes can be stored on a rack or shelf, in the packaging room, sealed inside a plastic bag. However, if the plastic is torn there is a chance the probes will become contaminated, therefore, assign this deficiency to category C. If the probes have become contaminated recommend that the probes be properly disposed of and assign the deficiency to category B. Category A is appropriate only if contaminated probes are put back into use. Assigning deficiencies to category D is appropriate only for very minor items, such as storing gaskets or other parts in a cabinet where probes are also stored (if the probes were sealed inside another container, such as a plastic bag, no comment would be required as this is an acceptable alternative).

Also check the cleanliness and condition of the weighing equipment.

Item D39—Portable Bin Filling Equipment (58.229).

Equipment for filling portable bins may vary considerably, from simple Y-type chutes to large screw conveyor arrangements for filling three to ten bins. Use this item to cover inspection of this equipment, flexible connectors, and filling attachments. If screw type conveyors are used, follow the applicable guidelines of Item D24—Product Removal & Conveying Equip.

Filling equipment for woven fabric sacks (e.g., super saks) shall meet the requirements the *USDA Equipment Guidelines* (see the guidelines for Item A3—Pumps, Pipelines, & Valves).

Item D40—Portable Bulk Bins (58.226).

When portable bulk bins are used for handling finished product, use this item to report on their condition and sanitation. For the item heading, insert the commonly used trade name (for instance, Tote, Delcon, Invert-A-Bins, etc.).

Portable bulk bins shall conform to the *3-A Sanitary Standards for Portable Bins for Dry Milk and Milk Products, Number 34-* . The standards provide for the use of either stainless steel or

aluminum for product contact surfaces (it is common industry practice to utilize the aluminum option). An amendment to this standard allows unpolished welds in aluminum product contact surfaces, therefore do not criticize unpolished interior product contact surface welds of aluminum bulk bins unless the welds exhibit cracks, pits or voids.

Inspect a sufficient number of empty bins to make an evaluation of those in use at the plant. This random inspection normally may be limited to bins which are easily available during the survey. Those examined will be considered representative of bins in service. Check for cleanliness on both inside and outside surfaces. A thin film of dry dust film on interior surfaces should not be criticized. However, caked or encrusted dry product should be criticized. Inspect ports, doors, latches, and gaskets for condition and product leaks. Show the number of bins inspected on the report together with the number found unsatisfactory and a brief description of unsatisfactory conditions. Make a recommendation for correction when applicable.

Also, observe the exterior condition of filled bins for cleanliness and freedom from leaks. Use of tape, towels, rags, etc. to prevent product leaks is a serious deficiency because it is not a sanitary practice and because such material might get into the product during subsequent dumping of the container. Recommend that such faulty bins be removed from service immediately for necessary repairs. (Tote Systems Inc. has developed a “blade seal door” to provide improved sealing against leaks, this door is now standard on new totes and is also offered in a special kit for field installation on older totes). If the inspection of portable bulk bins reveals routine use of tape, paper towels, rags, etc., to prevent product leakage from faulty doors or gaskets, assign this deficiency to category C.

Note:

> Do not criticize the use of shrink wrap if it is used to protect the door and gasket and if it is replaced each time the tote is filled.

Successful use of portable bulk bins for dry products requires a regular well-organized program of inspection, cleaning, gasket replacement, and maintenance. This in turn requires establishment by management of definite policies about cleaning and inspection frequency, assignment of responsibilities for the work, provision of adequate cleaning and maintenance facilities, setting up a record or tag system, etc. Recommend that such programs be set up when the condition or sanitation of bins is substandard.

Collapsible type bins are not covered by the 3-A Sanitary Standards, instead they shall comply with the *USDA Equipment Guidelines*. If super saks or reusable cardboard bulk containers are used, observe how the empty containers and liners are handled and stored. The empty containers and liners shall be handled in a sanitary manner.

Item D41—Product Packaging Temp. _____ ° F (58.240).

If the dryer(s) is operating during the survey, check the temperature of the finished product in a newly filled container (except lactose, which has no temperature requirements). Show the temperature in the space provided.

If the dryer is not operating during the survey, show a dash for this item to indicate "Not checked." However, if the previous report showed unsatisfactory product packaging temperature and no equipment correction was made, repeat the recommendation on the current report, with a notation that it is based on cooling performance observed at the previous survey.

When powder is temporarily stored in nonportable storage bins prior to packaging in bags, drums, totes, etc. it is not necessary to check the temperature of product in the bin. Heat loss from such stationary bulk bins is quite slow. If powder was too hot upon entering the bin, it will likely still be too hot at the time of final packaging. Check product temperature in the final container just after packaging from the bin and follow the same guidelines outlined for portable-type bins.

A. Packaging into 25 kg, 50 lb. or 100 lb. Bags, 240 lb. Fibre Drums, etc.

In all instances where the packaging temperature exceeds 110° F, powder cooling performance is unsatisfactory, improved cooling shall be recommended, and the deficiency discussed with management.

Product temperature in the range 111—125° F shall be considered a category C deficiency.

Product temperatures in the range 126—140° F shall be considered a category B deficiency. The plant manager shall be advised that better cooling performance will be necessary for continuation of plant approval. If the next quarterly survey again reveals packaging temperature in the 126—140° F range, and no changes are underway or ordered for upgrading the powder cooling system, the INELIGIBLE status shall be assigned (category A deficiency).

Product temperatures over 140° F shall be considered a category A deficiency and the basis for the immediate assignment of the INELIGIBLE status.

B. Product Storage in Totes, Super Sacks, and Other Bulk Bins.

When product is packaged into portable bulk bins or is temporarily stored in stationary bulk bins (more than overnight), cooling of product to approximately 90° F is encouraged because of the much slower rate of heat dissipation from such containers. §58.240 requires that "if the product is to be held in a bulk bin, the temperature should be reduced to approximately 90° F, but shall be not more than 110° F."

Cooling to 95° F or below will be considered satisfactory conformance with the "approximately 90° F" recommended nonmandatory provision of §58.240. However, in all instances where the packaging temperature exceeds 95° F, the cooling performance shall be checked unsatisfactory and a recommendation shown on the survey report.

Product temperatures in the 95—110° F range shall be considered a category D deficiency.

Product temperatures in the 111—120° F range shall be considered a category C deficiency.

Product temperatures in the range 121—130° F shall be considered a category B deficiency and the inspector should stress the importance of proper powder cooling to reduce the likelihood of heat caking (lumping) and adverse effect on product flavor and storability. The manager shall be advised that better cooling performance will be necessary for continuation of plant approval. If the next survey again reveals packaging temperatures in the 121—130° F range, and no changes are underway or ordered for upgrading the powder cooling system, this shall be considered a category A deficiency and the INELIGIBLE status shall be assigned.

Packaging temperatures more than 130° F shall be considered a category A deficiency and the basis for immediate assignment of the INELIGIBLE status.

C. Factors Affecting Powder Cooling.

When cooling is unsatisfactory, make recommendation for improvement and also discuss with management the possible alternatives for achieving better cooling. The following factors are important in systems which cool product by air:

1. Air lock to meter the hot product into the stream of cooling air (the air lock device prevents admittance of hot air from the dryer into the cooling system).

2. Good condition air lock under cooling cyclones (a leaky air lock will reduce the volume of cooling air drawn through the system).

3. Sufficient air inlet filters (kept clean) to avoid undue air resistance.

4. Enough air moved through the unit to cool the powder at the rate produced. This is a basic engineering consideration. Sometimes a booster fan for cold air will dramatically improve cooling performance.

5. Temperature of air used for cooling (if management proposes to cool the air prior to introduction of the hot powder, point out the access and cleaning problems with conventional fin-type heat exchangers, these matters should be considered in the development of such equipment).

6. A two-stage cyclonic cooling system using air at ambient temperature is an alternative to providing refrigerated air for a one-stage cooling system which does not cool the product sufficiently.

Discuss these points with management but do not include them in the recommendation for improved product cooling. Keep it simple, for instance: “Reduce NDM packaging temperature to 110° F or below, currently 115° F (C).”

Item D42—Packaging Workmanship (58.241a, b).

In checking packaging technique, observations should be made during actual packing operations. If not operating during the survey, arrange for opening a few bags of packaged powder for checking (when the survey includes sampling for Salmonella tests under Instruction DA 918—I, check packaging details on containers selected for sampling). Points to check include neatness of markings, powder on outside of bags and between liners, powder spilled on scale, protection of empty containers, tying of polyliners, sewing and sealing of bags, and handling of filled bags in the packaging room.

If container net weight is adjusted by supplementary hand filling, check to see that the "makeup" powder is stored in a clean covered container. A clean metal or acceptable plastic scoop should be used for this hand filling. Sewing machines should not be located directly over open containers of product.

When packaging is into portable bulk bins (tote bins, etc.) check that any spilled powder on top of the bin is satisfactorily removed by brushing or vacuuming after the top cover is applied. Vacuuming is the preferred way to clean exterior surfaces of such bins.

Item D43—Waste Products Handling (58.127f).

All waste powder (first product through a system, sifter tailings, dust collector bag bushings, etc.) shall be adequately packaged, clearly identified as animal feed or waste, and stored separately in the warehouse. Waste powder collection containers should also be clearly identified as animal feed or waste prior to filling.

A. Animal Feed (dry products).

When the dryer has an animal feed collector that does not meet the usual criteria for sanitary construction, sanitation, or location, check for the following points (see paragraph B for guidance where a plant has an ongoing animal feed or pet food production operation within the same plant as the human food operation):

1. Whether located within the plant or outdoors, the methods for collecting and handling the animal feed shall not constitute an insect, odor, or sanitation problem that would be inconsistent with the human food operation.

2. The animal feed shall be packaged with separate equipment into properly identified containers and be stored separate from human food. Storage in a separate area of the same warehouse may be considered satisfactory. If a plant is using the same equipment for human food quality and animal feed quality products recommend the INELIGIBLE status (category A deficiency).

B. Animal Feed (fluid products).

If the animal feed collector device uses water to “scrub” the air and collect the fines, means shall be provided for preventing back-flow of air through the device to the human food part of the dryer system during shutdown periods. Such back-flow prevention will also protect the dry parts of the dryer system from splashing or wet vapors when the animal feed wet collector is cleaned. Such segregation of the collector may be accomplished by disconnecting the duct during shutdown or by providing a suitable valve or shutoff device for the duct (the valve or shutoff device would not have to be sanitary type if suitably located downstream from the final human food collector in the drying system).

The storage area for fluid products, whether outside or inside, shall be maintained in a satisfactory condition. When the storage area is located outside a concrete slab, drain, and a water hose shall be provided to allow for cleaning and rinsing of the area. The storage tank(s) need not be sanitary, but leaky conditions noted in the tank, valve or load-out hose should be criticized. Necessary precautions shall be taken to minimize flies, insects, and development of objectionable odors. Inspect the exterior of the tank(s) and entire load-out area and, when applicable, make appropriate recommendations for correction.

C. Pet Food.

Use this item when a plant has an ongoing operation that uses human quality food that is disposed of as animal feed or pet food. All animal feed or pet food products shall be clearly labeled and stored separate from human food products. Storage in a separate area of the same warehouse may be considered acceptable, provided that satisfactory handling practices, housekeeping and inventory control procedures are demonstrated.

There is no objection to labeling and selling products for animal feed if it is of human food quality provided that all facilities, equipment, and processing procedures meet human food standards and requirements. This is a fairly common industry practice when there is little price spread for these utilizations.

On the other hand, it is not satisfactory for animal feed quality fluid products to be processed with human food equipment. Nor is it satisfactory to make animal feed employing substandard sanitation practices on human food equipment. Either of these conditions would be incompatible with USDA approval of a human food operation using the same equipment. If either condition is noted, the INELIGIBLE plant status shall apply (category A deficiency).

Item D44—Housekeeping (58.126e, 58.127f, 58.146d, 58.211).

See the guidelines for Item A7—Housekeeping.

Encourage the practice of storing only a day's supply of packaging supplies in the room on tables or metal racks at least six inches off the floor. Also check that the room is free of unnecessary fixtures, equipment, or false areas which may collect dust and harbor insects.

Item D45—Tote to Bag Packaging (58.241c).

When applicable, use this item and heading to cover bulk dumping equipment used to repackaging product from portable bulk bins into bags.

Check for compliance with requirements of §58.241c. Also check that repackaging is done in a suitable room or separate area to protect the product and to prevent spread of powder dust around the plant. Recommend relocation or enclosure of the operation when applicable.

As with other NDM packaging equipment, routine dry brushing or vacuuming is a satisfactory practice.

When portable bulk bins are used, check that they are cleaned before they are attached to the dump mechanism. In addition, the exterior surfaces of the unloading door shall be vacuum-brushed. A portable vacuum cleaner system can be used to do this or, preferably, a stationary industrial type vacuum cleaner with dedicated piping and hoses. The connections between the tote and the dump hopper shall be dust tight, sanitary, and shall protect the product from any dirt or foreign material that may fall from the exterior of the bin during the unloading process.

The bulk container unloading hopper shall be covered or sealed when not in use. Covers shall be of sanitary design and shall be properly stored when not in use. Inspect gaskets, level controls, and other parts for design and condition.

Super saks shall meet the above requirements and, in addition shall have a plastic liner. Debris from the exterior of the super sak shall be excluded at all times from the dump hopper. This can be accomplished by using a tight connection between the interior of the neck of the liner and the exterior of the dump hopper feed tube. Also, observe how the empty containers and liners are handled and stored before they are returned to the originating plant or disposed of. The empty containers shall be handled in a sanitary manner. They are to be neatly stacked, be clean and relatively dust free. They shall not contribute to poor housekeeping, poor dust control, or be a potential area for rodent or insect pest harborage. If the plant is dumping super saks that do not utilize a liner, assign the deficiency to category D. If the dumping is not done in a sanitary manner, assign the deficiency to category B. If contamination of the product is observed, assign the deficiency to category A.

Product Storage

Item D46—Room Construction - Warehouse (58.126, 58.153, 58.210, 58.241d).

See the guidelines for Item B53—Room Construction - Warehouse.

When the warehouse area is adjacent to or directly connected to the drying or packaging rooms, check for excessive powder drift. If the area is dusty, make an appropriate recommendation to correct the condition and to prevent further drift (also see Item D36—Dust Control).

Item D47—Lighting & Ventilation (58.126d, e).

See the guidelines for Item B54—Lighting & Ventilation.

Lighting shall be at least 5 F/C. If official sampling is performed in the warehouse, the sampling area shall have a minimum of 50 F/C.

Item D48—Housekeeping (58.126e, 58.127f, 58.146d, 58.241d).

Product in bags shall be placed on pallets or on racks elevated approximately 4 inches from the floor. It shall be stored in aisles, rows, or sections, approximately 18 inches from any wall, and in such manner as to allow easy access for inspection, cleaning, and spraying of the room perimeter.

Care should be taken in the storing of any other product foreign to dairy products, to prevent any damage to the dairy product from mold, absorbed odors, or insect infestation. Animal feed products shall be stored in an area apart from human food products to prevent contamination, insect infestation or mistaken use.

Check that packaging supplies, such as empty bags, are stored on pallets or racks up off the floor in an orderly manner for accessibility and cleaning of the room. It is preferable that the supplies be stored in an area separate from dry products. Check that packaging supplies are kept enclosed in their original wrappers or boxes until used. After removal of supplies from original containers, they shall be kept in an enclosed metal cabinet, bins, or on shelving and if not enclosed, shall be protected from powder and dust or other contamination.

General Items

See the guidelines for Page A — General Items

Page D. Inspection of Dry Products—Roller Process. (Form DA - 151 - 4)

Processing & Condensing

Items D1 to D13.

Follow the same guidelines as outlined for Spray Process drying operations.

Although the product is heated extensively in the roller drying process, this cannot serve as pasteurization. For USDA plant approval, the dairy product must be pasteurized with approved and sealed “3-A” HTST equipment or by the vat method.

When the product is condensed prior to roller drying, follow the spray process guidelines for these items. If there is no precondensing, show NA for these items.

Cooling and crystallization of condensed products is seldom employed prior to roller drying: show NA for these items.

Drying

Show the word “Roller” on the report page just above the “Drying” subheading.

Items D15 to D31.

Follow the same guidelines as outlined for Spray Process drying operations.

The source of the air supply used in the dryer room shall be free from objectionable odors, smoke, dust, or dirt and shall be filtered before coming into contact with product. Because of the nature of the drying process, all of the powder is exposed to the room air, therefore, all air entering this room shall be filtered. A minimum filter efficiency has not been established, therefore, when air is not filtered recommend that adequate filters be provided to supply clean air. Because a separate dryer air filter is not required mark Item D20—Dryer Air Supply NA.

Distribution of product between the rolls may be accomplished with an oscillating down-pipe or with a long pipe with holes in the bottom. Be sure to check such pipes for condition and sanitation.

Delete the heading for Item D22—Drying Chamber, instead use the term Dryer or Dryers. Show on the report the number and make of roller dryers. Most common makes are double-roll American, Blaw-Knox (Buflovak), and Overton machines. The drums (rolls) shall be smooth, readily cleanable, and free of pits (iron construction is unsatisfactory). The knives shall be maintained in such condition as not to cause scoring of the rolls.

Roll end dams shall be provided with a means of adjustment to prevent leakage and accumulation of milk solids. Wooden end dams are unsatisfactory. When noted, recommend replacement with sanitary impervious material such as phenolic resin, Micarta, etc. These plastic wear surface materials are usually about ¾-inch thick and, although quite rigid, they cannot withstand the pressures required to prevent product leakage at the interface with the revolving rolls. Metal backup plates are required to provide the necessary stiffness. The backing material should also be made of sanitary material, such as stainless steel or aluminum. The plastic wear surface material should be easily removable from the backing for cleaning of the interface. This can be accomplished by short positioning studs on the backing plate which protrude into partial holes in the back of the plastic material, plus a few conventional countersunk screw-bolts made of stainless steel. Check that the end dams are removed from the dryer after each run and are taken apart for thorough cleaning.

The vapor stack, hood, the drip pan inside of the hood, and related shields shall be constructed of stainless steel and be readily cleanable. Fabrication of the stack, hood, and drip tray shall be according to dairy construction procedures with all joints welded and smoothly finished. However, smoothly finished soldered joints, free of cracks, are acceptable. Open seams or other hard-to-clean construction features such as the use of rivets, crimped seams, overlapped “stovepipe” joints, rough or cracked solder joints, etc. are unacceptable.

The lower edge of the hood shall be constructed such as to prevent condensate from entering the product zone. Also, a removable stainless steel tray shall be located directly below the stack to prevent condensate or other particles from dropping from the stack into the product. Condensate from the hood trough and drip tray should be conducted to the floor by means of either piping or flexible hose. The condensate drain line, whether it is a pipe or a hose, should be easily removable for cleaning (be alert for leaks in the troughs and tray).

The hood shall be properly located and the stack shall be of adequate capacity to remove the vapors. Inspect the vapor hood, tray, stack, etc. for sanitation and show recommendations for any deficiencies. Stacks are very hard to clean manually because of their height and difficult access. Nevertheless, they should be cleaned as necessary. Encourage recirculation type cleaning using a spray ring or spray ball together with permanent piping, pump, and means of recovering the solution at the bottom of the stack.

Most exhaust stacks are equipped with a condensate ring to catch any liquid which runs down the inside. The condensate is piped to the hood trough or directly to the floor. Check the ring and pipe for leaks, cleanliness, etc.

The dryer stack shall be protected from birds and the elements during shutdown time. This may be accomplished with a stainless steel, aluminum, or equivalent metal cover (painting the cover is not satisfactory as loose paint could fall into the product). Since the exhaust vapors are not forced, as is the case with a spray dryer, a self-closing cover would not automatically open when the dryer is started. Since most stacks are quite tall, mechanical or manual means can be devised for operating the cover using cables, pulleys, chains, counter weights, etc.

Conveyor troughs, augers, and aprons used as product removal and conveying equipment shall be made of stainless steel or other metal with engineering plating such a chromium or nickel. Cadmium plating or galvanizing are not acceptable protective coatings for product contact surfaces. When the equipment is not plated with acceptable materials or when there is evidence of iron exposure or rusting, show as unsatisfactory and recommend replacement with stainless steel.

Note:

> Cadmium is a very toxic “heavy metal.” Dryers which have such coatings on product contact surfaces shall be assigned INELIGIBLE status.

Also show as unsatisfactory when auger type conveyors have flush type, greased end bearings or have center-located greased bearings in the product zone (use of so-called “edible grease” does not justify such construction). Recommend replacement with sanitary outboard type bearings when repair or replacement is needed. These outboard bearings shall be located at least one inch from the product zone at the shaft opening. When necessary, the shaft annular space shall be protected with a sanitary seal or by other means to prevent entrance of contaminants or escape of product (shaft hole protection may be unnecessary for side conveyors, but would be needed for auger type elevators to prevent powder leakage).

Bucket type conveyors may be used to convey product to the flaker or hammer mill, show on report whether it is belt or chain type. Also check the *Accepted Equipment List*. Follow the guidelines for Item A3—Pumps, Pipelines, & Valves, if the conveyor is not listed. In addition, remove access doors and inspect the unit carefully for construction, condition, and sanitation. Check the elevator housing for cracks, hard-to-clean areas, flush type bearings, access doors, gaskets, etc. If a belt type conveyor is used, check for riveted-on buckets, iron pulleys and shafts, etc. For chain driven units, inspect for deficiencies such as poor condition belt, mechanical splices on belt, bolted-on buckets, hard-to-clean chain links, iron sprockets and shafts, etc. Recommend replacement of conventional bucket type elevators which exhibit the aforementioned deficiencies.

Conveying may be accomplished with enclosed auger, filtered air, or with any other satisfactory sanitary equipment. If the elevating or conveying equipment is portable, wet cleaning after each dryer run is not necessary if inlet and outlets are protected and the unit is moved to a dry area while the roller dryer is wet cleaned.

If no cooling is used, show NA for Item D27—Powder Cooling System. When cooling equipment is used, inspect and report according to Spray Process Drying Operations

Most roller dryer systems do not require product cooling systems as there is usually sufficient heat loss through the conveying, elevating, flaking, pulverizing, and filling operations to result in packaging temperature under 110° F. However, during hot weather, or when production from more than one dryer is combined, higher temperature may be encountered. Cooling with air, as routinely employed for spray powder, is probably the most practical solution.

Packaging

Item D34 to D44.

Follow the same guidelines as outlined for Spray Process drying operations.

Packaging of roller powder may be conducted in the drying room if satisfactory dust control is maintained. During wet cleaning operations in the area, the packaging equipment should also be wet washed or should be kept dry by moving it out of the room or by covering it carefully with plastic. However, if inspection reveals inadequate dust control or unsatisfactory care of packaging equipment, recommend that a separate packaging room be provided.

When packaging is performed in the dryer room, air movement to the exhaust stack normally prevents dust drift into the warehouse or adjacent processing rooms. However, if dust drift out of the room is noted, recommend correction by improved ventilation or provision of a separate packaging room. When a separate packaging room is used, follow the guidelines for Item D34—Room Construction.

Delete the word “Sifter” from Item D37—Sifter and show “Flaker and Mill.”

A. Flaker.

The shell, shaft, arms, flaker bars, screen frame, screen, and any other product contact surfaces shall be made of stainless steel or equally corrosion-resistant metal. Show as unsatisfactory if shaft bearings are flush mounted. Recommend conversion to sanitary outboard type bearing construction when replacement or major remodeling is done.

The shaft, arms, and flaker bars need not be easily removable, provided that means of easy access are provided for cleaning. The screen should be easily removable for cleaning and should be fastened to its frame in a sanitary manner with no bolts, cracks, or crevices. Describe briefly any deficiencies with construction materials, sanitary fabrication, or cleanliness.

Show on report if no flaker is used. For instance, Overton Machine Company makes screw type elevators which deliver crushed flakes from the side conveyors directly to the mill. Crushing is accomplished with a spring-loaded device which subjects the flakes to pressure and abrasion from the side conveyor auger before the powder enters the screw type elevator. Inspect such devices, if used, and report any deficiencies with condition or sanitation.

B. Mill or Pulveriser.

Grinding of roller powder is usually accomplished with a small hammer mill, which in turn usually feeds direct into a bagging device (sifting of the product after the mill is not a requirement for USDA approval). The mill may be portable, in which case it is customary to disconnect the unit after the day's operation, and move it to a dry location during the wet

cleanup of the dryer. This is a satisfactory practice provided the inlet and outlet openings are protected and that exterior surfaces are cleaned, preferably by vacuum brushing.

The mill housing and all internal product contact surfaces shall be constructed of stainless steel or equally corrosion-resistant metal (aluminum construction, in good condition, should not be criticized). Show as unsatisfactory if shaft bearings are flush mounted. Recommend conversion to sanitary outboard type bearing construction when replacement or major equipment remodeling is done.

If the dryer(s) is operating during the course of the survey, determine temperature of the finished product in a newly filled bag and show the thermometer reading on the report. The requirements are the same as spray dried products.

Product Storage

Items D46 to D48.

Follow the same guidelines as outlined for Spray Process drying operations. .

General Items

See the guidelines for Page A — General Items

Page E. Inspection of Evaporated Milk or Sweetened Condensed Milk Operations. (Form DA-151-5)

Processing

Item E1—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Item E2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item E3—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

In the manufacture of sweetened condensed milk, the pumps, pipelines, valves, etc., are often sanitized by flowing steam. This is a satisfactory practice when they are part of an enclosed system and a temperature of 170° F is maintained for at least 15 minutes, or 200° F for at least 5 minutes. Such high temperatures can cause deterioration to gaskets and valve plugs and seats. Check these areas carefully for sanitation and condition.

Item E4—Preheaters (58.128j, k).

See the guidelines for Item A27—Product Cooler.

Tubular type heaters are most frequently used in the evaporated milk industry. However, there has been a trend in recent years toward use of plate type regenerative units and scraped surface types (for very viscous products) to accomplish part of the preheating. In most cases, multistage heating is used.

The final heater should be equipped with automatic temperature regulating controls and should have an indicating thermometer to help assure uniform preheating treatment.

It is not necessary to describe preheating equipment when condition and sanitation is satisfactory.

Item E5—Hotwell (58.919).

See the guidelines for Item D7—Hotwell.

When preheat treatment is in hold tubes rather than hotwells, inspect the hold tubes and show any needed recommendations under this item. Hold tubes may have welded joints. In such case, determine sanitation by inspecting inlet or outlet piping. Also inspect the pump (usually a positive displacement type) which induces flow through the hold tubes. If there are any pump condition or cleaning deficiencies, use this item to recommend correction.

Many evaporated milk plants use recording thermometers (formerly recommended on USDA inspections) to monitor the preheat treatment. While this is desirable, it is no longer a requirement.

In the manufacture of sweetened condensed milk, very high preheat treatments are also given to the standardized milk prior to condensing. Although there is no subsequent thermal processing, keeping quality of the finished product is assured by the high sugar-water ratio. The *General Specifications* do not show a minimum preheat treatment for sweetened condensed milk, but treatments in excess of 180° F for 10 minutes are commonly applied.

Item E6—Carrageenan Equipment.

The use of carrageenan is optional, and if it is not used, show this item as NA. When it is used, the feed pump should be constructed of stainless, but need not be easily dismantled nor of sanitary construction. The solution tank and agitator should be stainless steel and a cover provided. In most instances, the solution is heated with live steam. In this case, the steam shall be culinary quality (see the guidelines for Item A36—Culinary Steam).

Item E7—Evaporator(s) (58.913, 58.921).

See the guidelines for Item D8—Evaporator(s).

It is usual practice in the evaporated milk industry to employ very high preheat temperatures (200-250° F) and long hold times (2-20 minutes). Provision of a timed and sealed HTST system is not required to assure adequate preheat treatment before the evaporator (although all pumps, pipelines, valves, etc. must comply with the applicable 3-A Sanitary Standards). Bacteriological safety of evaporated milk is achieved by the subsequent thermal processing, usually accomplished with a continuous retort after canning.

Item E8—Evaporator Vapor Condenser (58.127, 58.217).

See the guidelines for Item D9—Evaporator Vapor Condenser.

Item E9—Filters (58.128a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Dismantle and check filter units for sanitation and condition. When a disc-type filter unit is used, remove sufficient discs to determine if cleaning procedures are adequate.

Item E10—Homogenizer (58.916).

See the guidelines for Item D19—High pressure Pump.

Have the homogenizer dismantled for inspection and pay particular attention to pistons, piston seal assemblies, intake manifold and strainer, pressure gauge fitting, and homogenizing valve assembly. When cleaning deficiencies are noted, recommend daily dismantling for hand cleaning. Recirculation procedures may clean much of the interior surfaces, but are often ineffective on one or more of the above-mentioned areas.

Item E11 —Product Cooler (58.128i, j, k).

See the guidelines for Item A27—Product Cooler.

Item E12—Standardizing Ingredient Handling (58.143).

Standardization of evaporated milk may be by the addition or removal of cream or skim milk or by the addition of condensed skim milk or nonfat dry milk. When considerable adjustment of fat and total solids ratio is necessary, it is common practice to make the modifications of the product prior to the evaporator. Afterward, tests of the product in each batch tank are the basis for any further needed standardization.

If the plant is adding one or more of these products, determine if they are originating from outside plants and whether or not such plants are USDA approved (see Item A31—Source Ingredients and record the deficiency under Item E50—Source Ingredients).

Inspect tanks, pipes, and pumps used for dairy standardization ingredients. If NDM is used, check the storage area and also the equipment and procedures used for reconstitution.

Sometimes water is added for standardizing purposes. There should be no criticism of iron, brass, or copper lines and valves for directing the water to the tanks. However, any portion of a water line which projects into a dairy ingredient tank or connects directly to a milk line should be of sanitary stainless steel construction back to and including the shut-off device, check valve, or backflow preventer.

Item E13—Standardizing Tanks (58.128d, 58.143).

See the guidelines for Item A29—Storage Tanks - Horizontal.

This item refers to storage or "batch" tanks used for final standardizing of product composition. Product storage temperature of 45° F or lower is satisfactory. If noted above 45° F, recommend improved cooling.

Item E14—Sugar Handling & Equipment.

If the plant does not request the code for sweetened condensed milk show NA for this item.

For sweetened condensed milk operations, use this item to check procedures used to dissolve and add sugar if crystalline type sugar is used. If sugar is dissolved in water, it shall receive a minimum heat treatment of 180° F, for 10 minutes or equivalent time-temperature. Show heating treatment applied. Also check that bags of sugar are opened and dumped in a sanitary manner. If liquid sugar is used (syrup) check the facilities for unloading bulk trucks and also the storage tanks for the syrup.

The sugar tanks and lines are not required to comply with the 3-A Sanitary Standards. Plastic, copper, or fiberglass can be used for the tanks, lines and valves. However, any portion of a line that projects into a dairy ingredient tank or connects directly to a milk line shall be of sanitary stainless steel construction back to and including the shut-off device, check valve, or backflow preventer.

Item E15—Cut-Back Equipment (58.128a).

During the evaporated milk filling and processing operations, a certain number of cans may be "cutback" because of slack fill, dents, seal failures, etc. Certain finished lots may also need reprocessing because of steam or mechanical failures during the retort process, stability or fat separation problems, etc. Equipment used to open and recover product from such cans shall be made of stainless steel and be of sanitary construction. Check it carefully for condition and sanitation, including any related pumps, piping, and storage tanks. Also, check for prompt cooling or timely reuse of the product.

The cutback operation shall be conducted in a processing room or area (the filler room is satisfactory).

Item E16—Storage Tanks (58.128d, 58.143).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

This item refers to storage tanks used for raw milk prior to evaporating. If milk temperature is unsatisfactory (above 45° F), show a recommendation for improved cooling.

Item E17—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Thermal Processing & Packaging

Item E19—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

A separate room is not necessary for the evaporated milk filling operations. However, construction of floors, walls ceiling, etc. should be equivalent to requirements for a processing area. Related doors or windows shall be effectively protected or screened against the entrance of flies and other insects. If a large common room is used for both filling and sterilizing operations, the entire area shall be so protected or screened. If the operations are located in separate rooms, the "processing area" requirement would apply only to the filler room. Inspect for effective screening and insect control in accordance with this guideline.

Filling of sweetened condensed milk into retail size cans should be conducted in a separate room which is suitably constructed for near aseptic filling operations.

Item E20—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item E21 —Pumps, Pipelines, & Valves (58.128a, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

If steam sanitizing is employed, check that the minimum treatment is 170° F for at least 15 minutes or 200° F for at least 5 minutes.

Item E22—Surge Tank to Filler(s) (58.128a).

Inspect the surge tank and level control parts for sanitation and condition. Dismantle the float control assembly for thorough inspection. The tank shall be provided with covers, which should be in place during tank use and be easily removable for cleaning.

Item E23—Filler(s) (58.914, 58.923).

Many fillers have product contact parts made of brass or chromed brass. This is satisfactory provided the parts are in good condition and free of corrosion and definite pitting. When definite pitting of product contact surfaces is noted recommend replacement of the pitted parts. When the condition is slight, no recommendation is necessary.

Inspect the rotary connection for the pipe which brings product into the filler and the areas underneath that lead to the "spider" tube distribution system. Inspect some of the "spider" tubes and the rubber or plastic connector hoses to the cylinders. Check sufficient cylinders, pistons, caps, gaskets, valves, foam checks and rubber filling nipples to determine if

satisfactory cleaning is performed. Remember that both sides of the piston are product contact surfaces. Similarly inspect all interior surfaces of each cylinder and also the hole which conveys product to the can.

Note:

> During the inspection process, be sure to place pistons, valves and other parts back into the same original tray or cylinder location. These parts are machined and calibrated for a specific cylinder and must not be mixed up.

Pay special attention to inspection of fillers that are "cleaned-in-place." Dickerson fillers are not easily adaptable for cleaning by recirculation methods. The construction metals will not permit use of strong cleaning solutions without damage to the surfaces. Also, solution flow through the assembled parts is quite slow and may not be effective in removing the product soil. For these reasons, cleaning is usually accomplished by dismantling of all parts for thorough hand brushing. Cleaned cell parts should then be placed in a tray, hosed with hot water to facilitate air drying and then be stored in a clean dry place until reassembly.

A variety of fillers are used for sweetened condensed milk and for large cans of evaporated milk of the No. 10 or confectioners sizes. Inspect as outlined above, the same guidelines apply except that exposed brass or copper construction should be criticized (sanitary stainless steel fillers are available for large cans).

Inspect the exterior surfaces of the filler equipment, including the iron frame, which should also be maintained clean and in good condition.

For sweetened condensed milk where aseptic filling is used, the cans and lids are usually subjected to a steam sterilizing treatment just prior to filling. Inspection of this equipment is not necessary except for cleanliness of exterior surfaces. Culinary steam is not required for steam sterilization treatment of cans and lids.

Item E24—Filler Parts Storage.

In addition to checking the filler parts as noted above, inspect the storage cabinet used to store parts. It should be maintained in a sanitary and orderly manner and parts should be kept covered until used.

Item E25—Thermal Processing Equipment (58.922).

For continuous operations, this equipment will usually consist of a preheater which then transmits the hot cans of evaporated milk to a second stage "sterilizer" or continuous retort. Check this item satisfactory if the exterior surfaces of the preheater and the retort are clean and in good condition. It is not necessary to report processing temperatures.

When batch type retorts are employed, show this item satisfactory if exterior surfaces are clean. For sweetened condensed milk operations, show NA.

Item E26—Control of Thermal Processing (58.915, 58.922).

In-can retort systems, whether batch or continuous, shall be equipped and operated in accordance with FDA requirements for *Thermally Processed Low Acid Foods Packaged in Hermetically Sealed Containers* (21 CFR 113). This regulation is applicable to Evaporated Milk, which is considered a "low acid food." The regulation specifies necessary retort equipment and controls, such as types and accuracy of thermometers, thermometer bulb location, pressure gauge, automatic steam controls, bleeders, vents, condensate removal, etc. Similarly, the regulations specify the required operating procedures, retort speed timing, emergency stop procedures, critical factor control, container and closure inspection, maintenance of process control records, and procedures to follow when there are processing deviations. The regulations also require that all operators of retorts, processing systems, and aseptic processing and packaging systems, and container closure inspectors shall be under the operating supervision of a person who has successfully completed an approved school for such operations.

This brief summary of the regulation indicates the wide scope of the equipment controls and operating procedures necessary for reliable thermal processing. It is not intended that USDA surveys would include checks for plant conformance with all of these requirements. Considerable time and special training would be necessary to make such evaluations. In lieu of inspecting the sterilizer instrumentation and operating procedure, ask the manager about plant compliance with the FDA regulation, including retort operation under supervision of trained personnel. Such training should be evidenced by a certificate(s) showing satisfactory completion of the required training course. If the manager supplies such evidence and also indicates compliance with the other requirements of the regulation, show this Item as satisfactory.

Item E27—Product Cooler (58.128j, k).

Check that the exterior surfaces of the cooler unit are clean and in good condition.

Show the temperature to which the canned milk is cooled (do not report the temperature of cooling water in the cooler). When this check is made during actual operations, ask the sterilizer operator to select a can coming out of the cooler. Plant can-opening and thermometer equipment may be used to make this temperature check. When milk temperature is above 100° F, recommend cooling to 100° F or below.

Note:

> Cooling the product too much may lead to wet cans at time of labeling and casing. This is an unsatisfactory condition which can cause exterior rust development.

Item E28—Pellet Detector (58.928, 58.929).

The plant should employ means of detecting and rejecting cans with solder pellets inside.

Pellet detectors usually operate by vibrating cans of filled product. A sensitive electronic detector differentiates the vibratory pattern of cans with solder pellets and rejects them. This test usually is made directly after the filler.

Item E29—Can Leak Detection (58.928).

A number of test methods are used in the evaporated milk industry to detect leaky cans.

1. A suction cup device is applied over the soldered end of each can immediately after filling and sealing. Cans with faulty soldered closures will be rejected. Seam leaks are not detected by this type of unit.

2. Compressed air is applied through a rubber sleeve to the soldered closure area of each can immediately after filling. If the soldered closure is faulty, air will enter the can, bulge the other end of the can and cause it to be rejected. Seam leaks are not detected by this type of unit.

3. Filled sealed cans are passed continuously through a 160° F hot water bath. The slight heating of air in the head space will cause bubbles to escape. An inspector watches the bath and removes leaky cans.

4. Continuous type preheaters cause bulging of can ends due to thermal expansion of the contents. As the preheated cans leave the unit, two precisely set rotating discs will reject any cans which are not bulged, indicating that they are leaky.

5. After preheating, retort treatment, and cooling, sound leak-free cans will return to their normal shape, that is, no bulged ends. Leaky cans do not contract to their normal shape upon cooling. Thus, another pair of precisely set rotating discs located at the cooler outlet is used to reject bulged cans.

The aforementioned FDA regulations concerning thermally processed low-acid foods requires qualified personnel to conduct detailed inspections and tests for reliable airtight seals when the cans are not the double seam type. Special instructions for the applicable personnel of evaporated milk plants is arranged in connection with training of retort operators. The FDA regulations also require maintenance of "Records of Container Closure Examinations."

Check that at least two of the five outlined test procedures are in use under the supervision of qualified (trained) personnel and that records are being maintained about number of leak defects by type and apparent cause, corrective action, etc. together with identifying details about date, codes, filler or retort line, number of cans tested, etc.

Net weight control is accomplished primarily by careful adjustment of each filler cell to deliver the correct amount of product. Adjustment is based on periodic test weighing of filled cans from each cell. (To obtain net weight, cans are gross weighed, emptied, washed, dried and weighed back.) Since these are volumetric type fillers, cell delivery will be quite constant if product composition and temperature remain the same. In addition to this periodic calibration of filler cells, some companies employ continuous monitoring devices on filled cans. Gross weight is often checked by means of a continuous rotary scale device located directly after the filler. Minor fill variations may be checked with electronic devices which can sense the product level in the filled can.

It is not necessary to review plant control of product net weight as part of the plant survey. Official test weighing is the responsibility of inspectors who perform requested product inspections.

Item E30—Can Drying.

Check this item satisfactory if cans are dry at time of labeling. When wet cans are noted, recommend correction. This is an unsatisfactory condition which can cause exterior rust development.

Correction can be achieved by varying the final cooling temperature (maximum temperature, as stated above, is 100° F), provision of more drying time on conveyors, installation of special blowers on the line to hasten drying, etc.

Item E31—Can Bin Storage (58.126e.2).

Can bin storage areas shall be maintained in a neat and orderly manner. Check for evidence of moisture, poor housekeeping, or other unsatisfactory conditions. Cans may be stored in a number of different ways; in boxes, in large paper bags, in neatly stacked rows in can bins, or loose in can bins. All these methods are satisfactory.

Where the plant uses cans directly from railroad cars or trucks, use this item to cover the transfer facilities as well as the area where the emergency can inventory is stored.

Item E32—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Items E33—37.

If the plant has batch as well as continuous retort systems, use these items to describe and report on the batch operations.

If the plant makes sweetened condensed milk, these items may be used as needed to cover crystallizing (58.925) and aseptic filling operations (58.924).

Labeling & Coding

Item E38—Room Construction (58.126e.2).

Use general guidelines of Item A1—Room Construction to evaluate construction. However, when there are no fluid processing operations in the room used for labeling and coding, construction need not be at the level required for processing rooms. Nevertheless, surfaces of walls, ceilings, floors, etc. should be sound and maintained in clean condition.

Item E39—Lighting & Ventilation (58.126d, e).

Check lighting intensity with a meter and report unsatisfactory readings. There shall be at least 30 F/C in the immediate labeling area.

When the area is large, the areas peripheral to the labeling and coding operations shall have at least 5 F/C.

Item E40—Labeling Equipment.

As the labeling equipment for filled cans has no direct sanitary significance, your inspection may be limited to exterior condition and cleanliness. Also, check for good housekeeping at the labeling equipment and immediate area. Check that supplies used in the immediate labeling area are maintained in a neat and orderly manner.

Item E41—Coding - Cans & Boxes (58.931).

Codes for cans of evaporated and sweetened condensed milk may be applied in a variety of ways—rotary inked stamps, embossing, label notching, etc.

Check a few cans at random for legible coding, which usually denotes plant, date, and batch number. It is not necessary to show the key to the plant code on the report. If coding is not legible, check the item unsatisfactory and recommend correction. Also check the coding on a few boxes and handle in the same manner.

Item E42—Boxing Equipment.

This equipment and surrounding area shall be maintained in a neat and orderly manner.

Item E43—Label Storage (58.126e.2).

Check the label storage room or area for maintenance in a neat and orderly manner. When unsatisfactory conditions are noted, recommend correction.

Item E44—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Product Storage

Item E46—Room Construction - Warehouse (58.126, 58.927).

See the guidelines for Item B53—Room Construction - Warehouse.

Inspect floor, walls, ceiling, windows, and doors for condition and cleanliness. Wood floors are satisfactory if they are sound, smooth, and kept clean. Check screening and fit of windows and doors to exclude insects and rodents. When large doors are used to load out rail road cars or trucks, check for birds or bird evidence in the warehouse. If found, record the deficiency under Item E56—Pest Control.

Finished products (evaporated or sweetened condensed milk) which are to be held more than 30 days should be stored at temperatures below 72° F. (If stored above 72° F, make a verbal recommendation to management.) Precautions shall be taken to prevent freezing of the product.

Item E47—Lighting & Ventilation (58.126d, e).

See the guidelines for Item B54—Lighting & Ventilation.

Lighting shall be at least 5 F/C. Ventilation shall be adequate to minimize or prevent condensation and mold problems. Some companies provide refrigerated storage, but this is not a requirement.

Item E48—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item B56—Housekeeping.

Check for storage of boxes in an orderly manner approximately 18 inches from the walls so that the room perimeter is easily accessible for cleaning, pest control, and inspection.

Check that no other items are stored in proximity to the evaporated milk which might cause shipping box problems with odor absorption, mold, or insect infestation. Similarly, animal feed products, any off-condition evaporated milk, etc., should be stored separately.

General Items

See the guidelines for Page A — General Items.

Page G. Inspection of Dry Products Blending and Packaging Operations. (Form DA - 151 - 6)

Product Dumping

Item G1—Room Construction (58.126, 58.211, 58.212).

See the guidelines for Item D34—Room Construction.

There shall be a separate room or area for product dumping operations and it shall meet all the construction and facilities requirements of Item D-34.

Any false ceiling areas("dropped ceiling") shall be accessible for cleaning and inspection. False ceiling areas should be discouraged in dry products processing areas.

A layout where the dumping operation is done from a mezzanine or solid deck level is acceptable provided that the following parameters are followed:

1. The mezzanine level or solid deck is sturdy and large enough to accommodate the entire dumping operation, to avoid product spillage, and prevent empty containers from dropping into the blender level below.

2. Blenders do not protrude through the mezzanine or solid deck into the dumping area.

3. Dump hoppers are firmly attached (with a flanged junction or flexible connector) to the blender covers below the mezzanine or solid deck level.

4. Provisions have been made to direct air flow from the dumping area away from the blending area.

5. Housekeeping practices and disposal of empty containers are properly observed.

Properly trapped floor drains shall be provided and the floors shall be pitched to the drain points. While the dry products' dumping room or area may not require regular or frequent wet cleaning, floor drains are required for times when wet cleaning will be necessary. Because of their infrequent use, floor drains should be equipped with a removable cap or seal or filled with a nonevaporating liquid. Open drains shall not be in the vicinity of air intakes for processing or conveying air.

The room should not have unnecessary equipment, fixtures, or unsealed false areas that may harbor insects or that may collect dust and debris. Give special attention to cracks, crevices or holes in the ceilings, walls, and floor to assure adequate insect control, following the guidelines for Item A37—Pest Control. If insect infestation is observed, record it under Item G50—Pest Control.

See the guidelines for Item G12—Feeding Equipment - Vitamins, etc. for guidance in handling small volume, special ingredients.

Item G2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item G3—Dump Hopper & Screen (58.228).

Dump hoppers and product contact surfaces of screens and hoods shall be made of stainless steel. Interior surfaces of the dump hoppers and hoods shall be accessible for cleaning and inspection. Design and construction shall comply with the *USDA Equipment Guidelines*. If the equipment is not in the *Accepted Equipment List* see the guidelines for Item A3—Pumps, Pipelines, & Valves. Check for defects such as open seams, exposed threads, improperly gasketed junctures, and inappropriate radii. Dump screens shall be removable and have openings not smaller than ½ by ½ inch. Exhaust ducts from hoods shall be made of stainless steel and be accessible for cleaning at least to the point where they are pitched away from the product contact surfaces.

Dump hoppers shall be positioned at a height above the floor that will prevent foreign materials or spilled products from entering the hopper. A hopper that passes through the floor or decking and has the blending, packaging, or conveying system underneath shall have a minimum of four-inch curbs to prevent foreign materials or spilled product from falling through the opening around the hopper. Raised decking shall be cleanable and should not have cracks and crevices that would contribute to poor housekeeping or pest control.

Platforms or tables shall be provided so that the outer plies of bagged ingredients can be easily removed or vacuumed before the bags are placed over the dump hopper. Encourage plant management to have this stripping or cleaning procedure performed in an area or room separate from the dump room. Wherever possible, outer plies are to be removed. However, the bags shall retain proper identification throughout the dumping procedures. Laminated bags that cannot be stripped of their outer plies shall be thoroughly vacuumed. Check that there are sanitary procedures for the handling and disposal of the empty containers.

The dump hopper shall be covered or sealed when not in use. Covers shall be of sanitary design and shall be properly stored when not in use. Inspect gaskets, level controls, and other parts for design and condition.

Item G4—Bulk Dumping Equipment (58.128a).

See the guidelines for Item D45—Tote to Bag Packaging.

Item G5—Conveyor(s) to Blender (58.128a, 58.221, 58.228, 58.246).

See the guidelines for Item D24—Product Removal & Conveying Equip.

Item G6—Dust Control (58.211, 58.230).

See the guidelines for Item D36—Dust Control.

Galvanized metal or plastic pipes, not in the product zone, are acceptable for vacuum conveying lines to dust collectors. Stainless steel lines are required in the product zone, which extends up to the point where the line first slopes downward, away from the dump hopper. Check that the fines collected from the dump hoppers are directed to an animal feed collector. Dump hopper fines are not acceptable as human food because of the introduction of unfiltered air.

The plant shall have a heavy duty vacuum system (see the guidelines for Item D30—Vacuum Cleaner) and shall use it regularly for dust control and housekeeping at the end of each production day. Check the floor, walls, ceiling, and ledges for accumulations of dust. Make recommendations as appropriate for the conditions observed.

Item G7—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

When it is necessary that ingredients be stored in the dump room or area, recommend that the supply of ingredients to be stored be limited to only a day's requirements. Ingredients should be stored on racks or tables that have approximately a six-inch clearance from the floor or on movable pallets.

All empty containers shall be handled in a manner that shall not adversely affect the cleanliness and housekeeping of the dumping room, general plant areas, or the plant environment. Check that the empty containers are disposed of in a suitable container or are neatly stacked on a pallet and routinely removed from the dumping area. Empty bags shall not be piled on the floor.

Keeping cardboard or paper products for recycling purposes is acceptable provided that these materials are maintained in a sanitary fashion and do not invite the harborage of pests. Waste collection containers shall be free of mold, insects, or excessive accumulations of product residue. The collected materials should be shipped from the plant regularly. Compactor equipment for reclaimed paper products shall be located outside the processing area.

Check exterior dumpsters or trash compactors. The areas surrounding such equipment shall be kept clean. Waste containers shall be provided with covers.

Dry Blending Operation

Item G9—Room Construction (58.126, 58.211, 58.212).

See the guidelines for Item D34—Room Construction.

Dry blending shall be done in a separate room or an area within the packaging room where there is sufficient distance between the operations to facilitate proper housekeeping and dust control. The room or designated area shall meet all the construction and facility requirements for a bulk packaging room.

Properly trapped floor drains shall be provided and the floors pitched to the drain points. Although the dry products blending room or area may not require regular or frequent wet cleaning, floor drains are required for times when wet cleaning will be necessary. Because of their infrequent use, floor drains should be equipped with a removable cap or seal or nonevaporating liquid. Open drains shall not be in the vicinity of air intakes for processing or conveying air.

Item G10—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

The room may be air conditioned to regulate temperature and humidity. Air systems drawing air from outside sources shall be filtered. Air ducts shall not blow directly on exposed product or product contact surfaces of vessels. Check air filters for proper placement and cleanliness. The room should be maintained at a slight negative pressure to minimize dust drift throughout the plant.

Item G11—Blender Loading Equipment (58.128a, 58.223, 58.228, 58.246).

Blenders may be loaded by a variety of methods. They may receive ingredients from mechanical conveyors (either belt or auger type), pneumatic conveyors, vacuum conveyors, or gravity chutes directly from dump hoppers.

If a conveyor is used list the deficiencies under Item G5—Conveyor(s) to Blender.

Inspect product contact surfaces for proper construction and sanitation. Pay particular attention to open seams, exposed threads, cracks, crevices, and other design or fabrication defects that would create hard to clean areas when the equipment would need to be wet cleaned. Product contact areas shall be free of product accumulations, moisture contamination, or discolored product.

Conveyors or chutes are to be properly positioned or suitably shielded to prevent the entry of contaminants from the exterior of the equipment. Inspect the exterior of all blender loading

equipment, and note exterior cracks and crevices that may collect dust or harbor insects and adversely affect the housekeeping, dust control, or pest control of the blending operation.

Very often blended products contain small-volume, high-cost, special ingredients such as vitamins, flavorings, or colorants. These special ingredients are not easily added to the product through the same system as the bulk ingredients. These ingredients may be added directly into the blender provided that the procedure is done in a sanitary manner.

Item G3 requires a separate room or area for the dumping operation. A dust collector attached to a blender does not satisfy this requirement. A separate dump hopper and blender are required. If direct dumping of bulk ingredients into the blender is observed, assign the deficiency to category C and record it under Item G3.

Item G12—Feeding Equipment – Vitamins, etc. (58.128a, 58.223).

Dry blending operations may have provisions to add a variety of small volume, nondairy ingredients to mixers or flowing product streams. These ingredients may be vitamins, flow promoting ingredients, flavorings, colorants, etc. The equipment used for adding these food chemical ingredients do not have to meet dairy construction criteria, except for the piece (nozzle, chute, auger, etc.) which comes in contact with the dry blended product or from which liquids may drip, drain or be drawn into the dry blended product. This piece shall comply with product contact surface construction criteria.

The same policy as above applies to feeding equipment for liquid nondairy ingredients. In addition, they shall be constructed in a way that would not adversely affect product sanitation or wholesomeness.

The equipment used for the addition of dairy ingredients shall comply with either the *3-A Sanitary Standards for Belt-Type Feeders, Number 75-* or with the *USDA Equipment Guidelines*. Check the sanitary condition of the unit. Regular dry brushing or vacuuming is a satisfactory cleaning practice for dry products feeding equipment. Feeders shall be equipped with tightly fitting covers to protect the products from contamination with extraneous materials.

Feeders that utilize air to convey the ingredients to the main body of the product shall use air that is supplied following the criteria in the *3-A Accepted Practices for Supplying Air Under Pressure in Contact With Milk, Milk Products and Product Contact Surfaces, Number 604-* .

Item G13—Blending Equipment (58.128a, 58.228).

The most common style of blending equipment used for dry blending operations is the ribbon blender. Other styles of batch and continuous blenders, however, may be employed. Refer to the *Accepted Equipment List*, if the equipment is not listed there, follow the guidelines for Item A3—Pumps, Pipelines, & Valves.

Ribbon blenders consist of a horizontal, cylindrical or half moon shaped body with a horizontal shaft running through it. Welded to the shaft are a series of support arms connected by one or more metal ribbons. The rotation of the shaft and the spiral configuration of the ribbons results in a vigorous mixing action of the various dry ingredients. Some models may incorporate secondary, high speed agitator or cutting blades mounted on the side wall of the body. Ribbon blenders shall be equipped with dust tight covers and sanitary discharge valve assemblies. Discharge valves may be located on either the bottom or end plates of the blenders.

Inspect the blender carefully for sanitation deficiencies. Product contact surfaces shall be free of product encrustation or wet product. Dry surfaces covered with a light film of product dust should not be criticized. Disassemble and inspect the discharge valves and shaft seals for evidence of improper or infrequent cleaning. While wet cleaning is not recommended for routine, daily cleanup, all dry blending equipment will be periodically wet cleaned. When a wet cleaning is conducted, carefully inspect that the cleaning has been thorough and that no wet product residue remains. Particular attention should be placed on the discharge valve and shaft seal assemblies.

Inspect the blender carefully for maintenance and design deficiencies. Support arms and ribbons shall be free of cracks and pits, be fully welded, ground, polished and have the proper radii. End plates may be either welded or bolted to allow for the removal of the ribbon shaft. Bolted end plates shall be fully gasketed. The gasket juncture shall provide a tight, pinch seal with the gasket material. Bent flanges that do not have sharp 90 degree sealing edges are unacceptable.

Shaft bearings are to be mounted outboard (a minimum of 1 inch between the bearing and the outer surface of the seal assembly is required) with sufficient space to allow cleaning and servicing of the sanitary shaft seal. Shaft seals shall be of a sanitary design and be easy to disassemble without the use of special tools. Dry products blenders may use solid plastic "V" or square shaped packing rings or air purge seals. Braided style packing may be used for dry products blenders provided they are discarded whenever the blenders are wet cleaned. The air supply for air purge seals must comply with the requirements of the *3-A Accepted Practice for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-* except that a sanitary check valve is not required and plastic air hoses and fittings can be used.

Inspect the cover to assure that it is tight fitting. There shall be no damaged or cracked areas on the cover. Cover gaskets may be removable or bonded. If bonded, there shall be no voids or crevices at the glue joints. Gasket material shall be of solid or closed cell rubber or rubber-like material.

When products are conveyed to the blender by pneumatic means, inspect the air exhaust filters or dust collectors for proper cleaning and maintenance. Product dust collected from ingredient dump hoppers shall not be discharged into the blender. These dust collectors draw substantial quantities of unfiltered air.

Tumbler type blenders mix ingredients by revolving the entire vessel. This style of blender may be cylindrical with internal baffles or "V" shaped. These are usually batch blenders, with the ingredients and finished product entering and exiting through the same valve assembly. Inspect the product contact surfaces as any other style blender.

For very large blenders it may be necessary to enter the blender to properly inspect the surfaces. Extreme caution is to be exercised whenever entering equipment. Follow the safety guidelines in Section I. P (which requires lock out/tag out, etc.). Also, do not enter without a plant representative present. If these requirements are not met, do not enter the equipment and recommend the plant initiate a confined space safety program. If the blender is only dry cleaned special boots or shoe covers, and protective clothing shall be used when entering. The plant shall provide sanitized rubber, plastic or disposable boots or shoe coverings and protective clothing. In addition, the plant shall provide a sanitized step, platform or mat to facilitate putting on the boots or shoe covering prior to entering the blender. Check that these sanitary items are kept clean and stored in a special cabinet. If these items are dirty, make the appropriate recommendations. A satisfactory alternative is to wet wash the blender after entering it.

Inspect exterior surfaces and support structures also for excessive product residue and exterior cracks and crevices.

Item G14—Fluidizers or Other Conveyors (58.128a,o, 58.221, 58.223, 58.246).

See the guidelines for Item D24—Product Removal & Conveying Equip.

Products may be conveyed from the blending equipment by air, vacuum, augers or belt type conveyors.

Item G15—Stationary Bulk Bins (58.226, 58.246).

See the guidelines for Item D28—Storage Bins & Conveyors.

If the bulk bin is equipped with automatic level control sensors, check that these are of sanitary design and construction. Mounting connections or flanges shall comply with sanitary fitting criteria. Paddle-style level sensors, such as "bindicators" shall not have twisted cable flexible shafts or threaded connectors. All paddles shall be fully welded with the proper radii. When unsatisfactory conditions are observed, recommend repair or replacement.

Item G16—Portable Bulk Bins (58.226, 58.246).

See the guidelines for Items D39—Portable Bin Filling Equipment, D40—Portable Bulk Bins, and D45—Tote to Bag Packaging.

Describe any deficiencies in container identification, condition or sanitation and make the appropriate recommendations.

Item G17—Dust Control (58.211, 58.230).

See the guidelines for Item G6—Dust Control.

Item G18—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Packaging

Item G20—Room Construction (58.126, 58.212, 58.213).

See the guidelines for Item D34—Room Construction.

There shall be a separate room for packaging operations and it shall meet all the requirements for construction and facilities for a bulk packaging room.

The location of doors or adjacent operations shall not cause excessive or unnecessary personnel traffic through the packaging area.

There shall be properly trapped floor drains provided and the floors shall be pitched to the drain points. While the dry products packaging areas may not require regular or frequent wet cleaning, floor drains are required for times when wet cleaning will be necessary. Because of their infrequent use, floor drains may be equipped with a removable cap or seal or nonevaporating liquid. Open drains shall not be in the vicinity of air intakes for processing or conveying air.

Item G21—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

The room may be air conditioned to regulate temperature and humidity. Air systems drawing air from outside sources shall be filtered. Air ducts shall not blow directly on exposed product or contact surfaces of product vessels. Check air filters for proper placement and cleanliness. The room should be maintained at a slight negative pressure to limit dust drift throughout the plant.

Item G22—Product Conveyors (58.128a, 58.228, 58.246).

See the guidelines for Item D24—Product Removal & Conveying Equip.

Item G23—Sifter (58.224, 58.246).

See the guidelines for Item D37—Sifter.

It is a USDA requirement that dry blending and packaging operations be equipped with a sifter at some suitable location following the dumping and blending operations and before the final packaging. A sifter is required to ensure all plastic and paper that may enter the product from the dumping operation are removed prior to packaging. The sifter shall comply with the *3-A Sanitary Standards for Sifters for Dry Milk and Dry Milk Products, Number 26-* . A sifter is not required when the plant is dumping powder from super saks, tote bins, or other bulk bins.

If the ingredients are mechanically or pneumatically conveyed from the dump hopper to the blender, the sifter may be placed just before entrance to the blender.

The size of sifter screen openings may be dictated by the type of product being processed. However, they shall be sufficiently small to cull out oversized particles and extraneous materials from the dumping operations such as pieces of paper bag, plastic liners, string, etc. See the appendix of the 3-A Sanitary Standards for general guidance on screen openings.

Item G24—Packaging Machine (58.229).

Check that the filling equipment is of sanitary design and construction. New or replacement equipment shall comply with the *3-A Sanitary Standards for Equipment for Packaging Dry Milk and Dry Milk Products, Number 27-* .

Filling equipment may vary depending on the size and style of package for the finished product. Finished products may be packaged in bulk bags (50lb. or 25Kg.), consumer size bags or pouches, consumer size boxes, single serving pouches or packets, cans, jars, envelopes, etc. Filling equipment configurations may therefore vary considerably.

Generally the filling equipment for small packages has been manufactured for the general food industry and not the dairy industry. Carefully check the machines for cleanability and ease of disassembly. While frequent wet washing of dry product packaging equipment is not recommended, wet washing will occasionally be needed, therefore ease of disassembly is important. Product contact areas shall be free of cracks, crevices, and exposed thread. The equipment shall protect the product from contamination.

Item G25—Conveyors, Scales, Vibrators (58.128a, m, 58.241).

Equipment used for handling packaged product such as conveyors, scales and vibrators are not considered product contact surfaces. They should be checked, however, for general cleanliness. The equipment shall be free of accumulations of spilled product that provide breeding places for insects or contribute to the growth of mold.

Item G26—Sealing Equipment (58.128).

Sealing equipment for dry blending operations may vary according to the size, type, and style of the finished product container (bags, pouches, packets, cans, or over wrapped fiberboard boxes).

Regardless of the size or style or package used, the sealing equipment must be constructed so that the products are protected at all times from the entrance of extraneous materials from the environment or from the sealing equipment itself. Recommend protective shields and guards as appropriate.

Check the equipment for cleanliness. The equipment shall be free of accumulations of old or encrusted product residues. If the equipment utilizes heated surfaces for sealing purposes, the surfaces shall be in good repair and free of accumulations of charred product, glue, or wax.

Whenever possible, observe the equipment in operation to check that the containers are being properly sealed. Closures shall be tight, and free of wrinkles or voids to prevent the product from leaking out. Any over wrap shall completely envelope the interior box, be tightly sealed to the box and be free of wrinkles that would allow insects to enter the container.

Check the interior drive and control areas of the equipment for excessive product accumulation or evidence of insects.

Item G27—Packaging Workmanship (58.241 a, b, c).

Observe actual packaging operations when assessing packaging technique. If packaging is not in process during the survey, arrange to have two or three boxes of packaged product opened so that the packaging can be evaluated.

Workmanship items to be checked include the neatness and readability of markings and coding, absence of product residues on the exterior of the packages, no product spillage during packaging, proper sealing of the containers, protection of empty containers before they are filled, and handling of filled containers.

When package weights are adjusted manually, check that the "makeup" product is stored in a clean, covered container and that a clean, sanitary, plastic or metal utensil is used for this operation. Also, the product in the "makeup" container shall be the same as that being packaged.

When unsatisfactory workmanship factors are observed, make appropriate recommendations for improvement.

Item G28—Facilities to Clean Equipment (58.128a, 58.146a, 58.246).

Dry blending and packaging equipment is normally cleaned by dry methods. Wet cleaning should be reserved for changeovers to different products or special cleaning activities (e.g., after Salmonella or Listeria contamination had been detected). Check that adequate brushes made with molded plastic heads and with plastic or metal handles are used for cleaning purposes. Separate brushes shall be used to clean product contact surfaces and nonproduct contact surfaces. Brushes used for the product contact surfaces shall be identified and stored in a sanitary storage cabinet. If air is used for cleaning, make sure dust control is maintained during the cleaning procedures so that other plant operations are not adversely affected by dust drift.

Although wet cleaning is reserved for special cleaning activities, adequate facilities for wet cleaning shall be present. Hot and cold water shall be readily available. Floors shall be

equipped with adequate floor drains and be constructed with a proper slope so that the entire room environment can be effectively cleaned. When wet cleaning is conducted at the time of the survey, carefully check that all product residues have been removed. Check for pockets of wet or caked powder in the equipment or in hard to reach areas of the rooms. All areas or pieces of equipment that have been wet cleaned should be allowed to dry completely before reassembly.

Item G29—Vacuum Cleaner (58.230).

See the guidelines for Item D30—Vacuum Cleaner.

Item G30—Other Products Processed (58.151, 58.152, 58.241, 58.242).

Check that all other products processed or packaged are fit for human consumption. If animal feed or nonfood products are packaged, except as noted below and allowed by Item D43—Waste Products Handling, recommend the assignment of the INELIGIBLE status.

If the plant blends and packages other dairy products for which it has not requested approval, the plant shall have operating procedures that will prevent the intermixing of these unapproved products and products subject to inspection and approval. Check that there are efficient dry cleaning procedures for all equipment. The approved products should be run first. Alternately, the unapproved products shall be taken out of the system prior to processing approved products. Unapproved products shall not be "flushed out" with approved product.

A plant that blends and packages human food products that have an offensive odor or that are incompatible with dairy operations, such as meat or poultry broths, gravies, etc., shall provide totally separate blending and packaging equipment. There shall be no cross utilization of any equipment between the two operations. If shared equipment is observed, the INELIGIBLE status shall be assigned (category A deficiency).

A plant that blends and packages nondairy human food products that are incompatible with dairy operations because of color or odor shall provide a comprehensive quality manual detailing the steps that will be taken to prevent cross contamination between dairy products and other products. A copy of the quality manual shall be sent to the Washington Office. If you encounter this situation during a survey, contact the National Field Office or the Washington Office to determine if this requirement has been met. If this requirement has not been met assign the deficiency to category C.

Item G31—Waste Products Handling (58.127f, 58.241c).

See the guidelines for Item D43—Waste Products Handling.

Item G32—Dust Control (58.212, 58.230).

See the guidelines for Item G6—Dust Control.

Item G33—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Product Storage

Item G35—Tanker Unloading & Equipment (58.126, 58.128a, o, 58.221, 58.246).

If the plant receives bulk dairy ingredients, try to inspect at least one transport truck trailer or railroad car during the survey.

A. Room Construction.

See the guidelines for Item A2—Lighting & Ventilation and A10—Room Construction.

Check if the location of doors or adjacent operations is causing excessive or unnecessary personnel traffic through the unloading area. If excessive personnel traffic is observed, recommend that management take steps to reduce or limit access to this area.

Truck drivers should not be allowed inside the processing area.

Hot and cold water and hand washing facilities shall be available in the unloading area.

B. Unloading Equipment, Lines and Valves.

Bulk tankers or railroad cars are routinely unloaded pneumatically. These unloading systems shall comply with criteria in the *3-A Sanitary Standards for Pneumatic Conveyors for Dry Milk and Dry Milk Products, Number 39-* .

Rotary airlocks, whether supplied by the plant or which are integral parts of the bulk tankers/trailer, shall be reviewed and accepted by the Dairy Grading Branch.

Check that filters for conveying air are the correct types and are installed properly to prevent the entrance of unfiltered air during unloading. All pipelines, flexible hoses, valves and fitting shall be of sanitary design. Unloading hoses shall be tightly capped when not in use.

Equipment that is not routinely wet washed must be adequately protected from moisture during cleanups of the unloading facilities or when high humidity conditions exist. Check that unloading hoses are properly stored in clean cabinets or racks. If the unloading hose is transported with the truck, it should be protected inside a sealed tube.

Inspect product contact surfaces of the unloading equipment for evidence of encrusted product or moisture.

C. Unloading Procedure.

Whenever possible, observe tanker or railroad car unloading procedures. Check that all connections are adequately cleaned and sanitized or are capped prior to unloading. If the tankers or railroad cars have vents, check that vents are properly covered by filters.

D. Inspection procedure.

Inspect (with a flashlight if necessary) the interior of the truck trailers or railroad cars to determine if the trailer is of sound construction, has no protruding nails or broken internal walls, is free of debris or spilled product from damaged containers and is free of mold, insect, or rodent infestation. Describe any deficiencies in truck or trailer condition, sanitation, or housekeeping practices and make the appropriate recommendations. Record on the report the truck's identification number or name so that the plant can follow-up on deficiencies.

If dry products are received in bulk tanker trailers, check if the tanker design and fabrication have been reviewed and accepted by the Dairy Grading Branch. Refer to the *Accepted Equipment List*. If it is not listed there, see the guidelines for Item A3—Pumps, Pipelines, & Valves.

If the bulk tanker trailers are routinely wet cleaned after unloading, inspect one trailer following the inspection guidelines for a liquid tanker in the Bulk Receiving Section (Item A13—Truck Tanks, Pumps, & Fittings). When a tanker is entered for inspection purposes, instruct plant management to have the tanker rewashed after the inspection.

If the bulk tanker trailers are not wet cleaned and are left in a dry condition instead, follow the inspection guidelines for a box type spray dryer as outlined in Item D22—Drying Chamber and Item D29—Dryer Dry Cleaning Methods. These require special boots or shoe covers, a sanitized step, platform, or mat to ease putting on the boots or shoe coverings and entering the tanker, a special cabinet for storage of these sanitary items, etc.

The interior surfaces of the tanker may be dusty but are unacceptable if they show areas of heavy or encrusted product buildup, discolored product, or dampness. Door openings, inlets and outlet valves and hoses shall be of sanitary design and maintained in a clean condition. If the trailer is equipped with an onboard rotary airlock valve, it shall comply with the *USDA Equipment Guidelines*. Describe any deficiencies in tanker condition, sanitation or housekeeping practices and make the appropriate recommendations. Record on the report the truck identification number or name so the plant can follow-up on the deficiencies.

Item G36—Room Construction - Raw Ingredients (58.126).

See the guidelines for Item D46—Room Construction - Warehouse.

Products should be stored in an orderly fashion to simplify inventory control and proper identification. Bulk ingredients may be received in a variety of packaging styles such as bulk bags (50 lb. or 25Kg.), portable bulk bins (metal, cardboard, or woven fabric), or over-the-road tankers. In all cases the condition and identification of the containers shall be checked.

Carefully check that the ingredients are stored in an orderly way for easy identification. Ingredients shall not be stored in close proximity with nonfood materials such as cleaners, pesticides, etc.

Carefully check for damaged or torn containers, sifting or exposed product, and insect, rodent, or other infestation. If rodent or insect infestation is observed, follow the guidelines for Item A37—Pest Control and record the deficiency under item G50—Pest Control with the appropriate recommendations. Also, recommend that infested or contaminated products be removed immediately from the plant.

Item G37—Lighting & Ventilation (58.126d, e).

See the guidelines for Item B54—Lighting & Ventilation.

Item G38—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item D48—Housekeeping.

Item G39—Room Construction - Finished Products (58.126).

See the guidelines for Item D46—Room Construction - Warehouse.

Item G40—Lighting & Ventilation (58.126d, e).

See the guidelines for Item B54—Lighting & Ventilation.

Item G41—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item D48—Housekeeping.

General Items

See the guidelines for Page A — General Items.

Page H. Inspection of Instant Products Operations. (Form DA - 151 - 7)

When referring to other section items for inspection guidance, make appropriate interpretations of terminology which do not alter the intent of the guidance provided.

Product Dumping

Item H1—Room Construction (58.126, 58.212).

See the guidelines for Item G1—Room Construction.

Item H2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item H3—Dump Hopper & Screen (58.228).

See the guidelines for Item G3—Dump Hopper & Screen.

Item H4—Bulk Dumping Equipment (58.128, 58.212).

See the guidelines for Item D45—Tote to Bag Packaging.

Item H5—Conveyors (58.128a, 58.221, 58.228, 58.246).

See the guidelines for Item D24—Product Removal & Conveying Equip.

Item H6 —Sifter (58.224 and 58.246).

See the guidelines for Item D37—Sifter.

If the base product is received in bulk (tote bins or super saks) and the product was sifted at the place of manufacture, a sifter is not required at this stage of the instantizing process. However, bagged product should be sifted to prevent pieces of paper, plastic, or string from entering the product.

Item H7—Dust Control (58.212, 58.230).

See the guidelines for Item G6—Dust Control.

Item H8—Housekeeping (58.126d, 58.127f, 146d).

See the guidelines for Item G7—Housekeeping.

Agglomerating & Redrying

Item H10—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

The location of doors or the adjacent operations shall not cause excessive or unnecessary personnel traffic in the agglomerating area.

Carefully check for deficiencies in floor drains and traps that are located in the areas of air intakes for processing or conveying air.

Item H11—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

The room which houses the agglomerating system may be ventilated with air movement induced by the agglomerator itself and the redrying air intakes. Outside air is drawn into the area opposite the system intake air filters. As the air circulates it picks up some heat as it passes over warm surfaces of the equipment. Generally room ventilation is not a problem because of the large volumes of air being used in the process.

For systems that use steam as the agglomerating media, check the areas around the steam pipes for leaks that may cause humid conditions sufficient for mold growth.

When systems are used only intermittently or have been shut down for extended periods, check them more closely for condensation and mold.

Item H12—Conveyors & Metering Equipment (58.128a, 58.228 58.246).

See the guidelines for Item D24—Product Removal & Conveying Equip.

If a new system utilizes a rotary airlock valve as the metering device, the valve shall be reviewed and accepted for use by USDA. Make recommendations as appropriate. Installed rotary valves which do not meet the established USDA criteria but have been under continuous USDA inspection may continue to be used. However, when a new valve has to be installed, it shall comply with the USDA requirements.

Item H13—Feeding Equipment - Vitamins, etc. (58.128a, 58.223).

See the guidelines for Item G12—Feeding Equipment - Vitamins, etc.

Item H14—Moistening Equipment (58.128 a, 58.223).

Some instantizing systems do not use special wetting and redrying equipment. These "single pass" systems may use a variety of methods of air or gas (usually nitrogen) injection to foam the condensed product as it is atomized in the drying chamber. These systems shall be inspected using the dry products inspection criteria covered by Items D15 through D31.

Systems that utilize a moistening medium shall meet the *3-A Accepted Practices for Instantizing Systems for Dry Milk and Dry Milk Products, Number 608-* . These systems may be designed to operate either pneumatically or mechanically.

Pneumatic systems generally consist of a high volume air stream containing the dry product and other dry ingredients such as the vitamins, which blows past or through an injector or nozzle which introduces the steam or liquid wetting medium. The equipment is designed so that the interface area of the air stream and the liquid medium creates high turbulence completely wetting the dry products and the individual particles begin to agglomerate (clump together). The agglomerated particles are then carried through the rest of the system by the air stream.

Mechanical systems work on the same principle, but make use of a high speed agitator blade assembly to create the necessary turbulence for wetting the dry product stream.

Pneumatic and mechanical systems can use the same wetting media. Generally, the wetting medium is saturated steam, water, or a mixture of water and other liquid ingredients such as lecithin, or pasteurized skim milk.

When skim milk or other dairy products are used as the moistening medium, all tanks, pipelines and valves shall meet product contact surface requirements for fabrication and sanitation.

Unlike other dry products systems, portions of an agglomerating system require daily wet washing. This is because of the moisture added during the agglomeration process. Generally, daily wet cleaning of the system up to the redrying equipment is required. Product conveying lines, airlock valves, collectors, sifters, and the rest of the system may be wet cleaned only occasionally.

All moistening medium injectors, nozzles, venturi, rings, etc. which are within the product contact zone shall be of sanitary construction. These components shall be accessible for inspection and cleaning. They shall be designed for daily disassembly and hand cleaning. They shall be free of cracks, crevices, and exposed threads.

If the equipment is cleaned by mechanical means, all product contact surfaces are to be designed so they can be cleaned effectively while fully assembled or they shall be designed so that they can be easily detached for hand cleaning. Adequate cleaning facilities (i.e., COP tanks, drying racks, mats, brushes, cleaning compounds, etc.) shall always be available for general cleaning purposes. Mechanical cleaning devices which are permanently installed in the equipment shall meet all product contact surface requirements for design and construction.

Mechanical devices which are inserted into the equipment for cleaning purposes only and are removed during production do not have to meet product contact surface requirements.

Inspect the mechanical cleaning system to check that provisions have been made to automatically control the cleaning process. Rinse and solution temperatures, cleaning cycle durations, and cleaning compound additions are to be automatically controlled. To determine the effectiveness of the cleaning regimen, disassemble some components of the system and check for product residues. If ineffective cleaning is noted, make the appropriate recommendations on the survey report.

Item H15—Moistening Medium.

Check that the moistening medium is prepared and handled carefully to prevent the contamination of the product stream. Dry nondairy ingredients that are used in water mixtures shall be prepared using the same procedures and techniques as dry dairy ingredients. Bags are to be cleaned and the outer plies shall be removed prior to dumping the ingredients. Dump hoppers and blending equipment are to be kept clean and shall not contribute to unsatisfactory housekeeping conditions in the plant.

Dump rooms, hoppers, and conveyors shall comply with the inspection guidance of Items H1 through H8. Liquid or reconstituted dairy products shall be pasteurized before injecting them as the moistening medium.

Steam, if used, shall be of culinary quality (see the guidelines for Item A36—Culinary Steam).

When water or water mixtures are used, check that the water supply is a potable supply or State accepted process water (see the guidelines for Item A38—Water Supplies & Handling). Cow water, condensate or RO permeate are not acceptable moistening mediums. If any of these are used, recommend the INELIGIBLE status. Check that water supply lines have the proper check valves and back-flow preventers. If provided, check mixing tanks for cleanliness. These items do not require sanitary dairy construction but they should be clean. Iron pipes and vessels with threaded fittings may be used up to the introduction into the product contact area provided that a sanitary check valve separates the nonsanitary and sanitary pipelines, and that the product contact fittings are of sanitary design.

Item H16—Redryer Air Filters & Heaters (58.128a, 58.220c).

See the guidelines for Items D20—Dryer Air Supply and D21—Dryer Air Heating System.

Check that the design and fabrication of redryer air filters and heaters meet the requirements in the *3-A Accepted Practices for Instantizing Systems for Dry Milk and Dry Milk Products, Number 608-* .

Air heating coils or finned radiators shall be clean and free of product and dust accumulations. If placed downstream from air filters, the heating coils shall be made of stainless steel, be of

sanitary design and fabrication and shall be accessible for cleaning and inspection. Access doors are to be tight fitting with good-condition gaskets. Piano style hinges should not be used.

Fans located downstream from air filters shall be made of stainless steel and be of sanitary design and fabrication.

Check that air filters are properly placed and that the filter housings, fan shaft annular space openings, plenums and ducts are tight-fitting and properly gasketed to prevent the entrance of unfiltered air into the system.

Item H17—Product Redrying Equipment (58.128a, 58.220c, 58.223).

Redrying equipment for an instantizing system is often quite different from redryers found on conventional spray dryers. The agglomerated (instantized) product is very fragile so it must be treated gently to minimize the creation of excessive fines which will require further reclaiming and reprocessing and reduce the efficiency of the operation.

The most common style of redryer in an instantizing system is the fluid bed redryer. The product is continuously fed onto the screen bed. Warm or cool air is introduced into the air plenum chamber below the screen. As the air travels upward through the screen, it dries or cools the product and "fluidizes" it as well. The product is then gently moved along the screen from the inlet to the outlet by a shaking or vibratory action. This drying equipment may come in different sizes and may be designed for either manual disassembly and hand cleaning or for mechanical cleaning.

Air chambers below the screen shall have continuously welded joints and seams. The joints may be of any radius. The welds need not be polished but shall be relatively smooth and snag-free without any pits or voids.

Screens which are bolted between flanges are acceptable. Screens which are intended for mechanical cleaning shall form a tight, gasketed seal with no decreasing angles formed by the construction of the flanges. When screens are welded, access shall be provided above and below the screen for inspection and cleaning.

Like other drying equipment, fluid bed redryers do not require daily wet cleaning. The interior of the units may be cleaned by brushing or vacuuming. However, when wet cleaning is performed, all product and air contact surfaces must be completely and effectively cleaned.

Equipment that is designed to be cleaned without disassembly shall have all product and air contact surfaces cleaned by mechanical means. Components that cannot be mechanically cleaned shall be disassembled and hand cleaned. Spray balls and other cleaning devices that are left in the equipment during production shall be of sanitary design. Spray cleaning devices that do not have a sanitary design are acceptable if they are removed during production and inserted only for the cleaning process.

Item H18—Star Valves, Connectors, Fittings (58.128).

See the guidelines for Item D24—Product Removal and Conveying Equip.

Connections, sensors or other devices attached to the product contact surfaces shall be of sanitary design. Check the units for possible entry points of unfiltered air into the system. A Cherry-Burrell system requires careful inspection because its design has many potential sites for the entrance of unfiltered air. Make recommendations as appropriate.

Item H19—Product Fans & Ducts (58.221).

See the guidelines for Item D24—Product Removal and Conveying Equip.

Note:

> If you make recommendations about fans or ducts, indicate their location in the instantizing system. Many systems do not have product fans and ducts between the redryer and the cooler. The redried product often enters a cooling section within the same fluid bed or is dropped by gravity into a separate fluid bed cooling unit.

Item H20—Dust Control (58.211, 58.230).

See the guidelines for Item G6—Dust Control.

Item H21—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Product Cooling

Item H23—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Item H24—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item H25—Cooling Air Filters & Ducts (58.222, 58.223).

In most systems, the dry instantized product is cooled by cold air in fluid bed style equipment (see the guidelines for Item H17—Product Redrying Equipment).

Inspect the air filters, conveying fans, and ducts for compliance with the *3-A Accepted Practices for Instantizing Systems for Dry Milk and Dry Milk Products, Number 608-* . Use a strong flashlight to inspect the interior surfaces of filter housings and ducts. Check for gaps, openings, or improperly positioned filters that allow the entrance of unfiltered air into the system. Check cooling coils and condensate drains for proper construction and sanitation. Make recommendations as appropriate. Long air ducts shall be constructed to allow easy access for cleaning and inspection.

Ducts utilizing Morris style clamps are acceptable provided that every clamp is taken apart when the duct systems are wet washed.

Check for badly dented conditions on the cooling components which may cause difficulty in cleaning. The use of tape to seal cracks, and improperly gasketed or misaligned joints in product or air ducts are unacceptable. When these conditions are observed, recommend repair or replacement.

Item H26—Product Cooling Equipment (58.222, 58.223).

Systems may utilize the air within the plant, external air, or air which has been mechanically cooled to cool the product.

To improve cooling efficiency, most systems use chilled water or mechanical refrigeration to cool the air supply. These air cooling units usually have coil and fin type construction which may be very difficult to clean. Remove the air inlet filters and any access doors so that both sides of the coils can be inspected. If the coils are dirty, recommend cleaning. Try to determine why they are dirty (improper placement or missing filters, entrance of unfiltered air, back draft of product, etc.) and make recommendations as appropriate. Dirty cooling systems are a potential source of Listeria or Salmonella bacteria contamination and should be considered a critical control point.

Condensate drains from the mechanical refrigeration coils shall be properly trapped and directed to a sanitary sewer. Sewer connections are to be designed to be protected from negative pressures which could result in drawing air from the sewer into the cooling air stream.

Item H27—Fines Collectors & Handling (58.128a, 58.221, 58.223).

Systems that collect fines for animal feed do not require further inspection but check that the containers are properly labeled and that the fines do not create sanitation problems in the plant.

Only instantizing systems that are completely enclosed or which are designed and operated to control air flows and prevent the entrance of unfiltered air may reclaim fines for human food use.

Evaluate all parts of the instantizing system to determine if the fines may be reclaimed as human food. If unsatisfactory conditions exist and the fines are being reclaimed as human food, recommend that the operation be discontinued immediately and recommend the INELIGIBLE status.

Since the fines system handles only dry product, the related piping and ducts do not require frequent wet cleaning. Because the rest of the system is wet cleaned regularly, there must be some means of keeping the fines section of the system from getting wet. This can be done by making a physical break in the duct system. Check that the fines system is clean and free from evidence of condensate accumulation.

Fines are often immediately mixed with base product and subjected to rewetting as recycled product. This is a satisfactory practice if the fines are properly collected and handled.

Item H28—Product Sizing Equipment (58.223).

Single pass instantizing systems generally do not use any specialized sizing equipment other than conventional sifters. Agglomerated products may require some method of size reduction to break up the large clumps of product. Depending on the systems design, the sizing equipment may be a hammermill, a rotary mill, or sizing rolls.

Hammermills or rotary mills shall comply with the requirements of the *USDA Equipment Guidelines*. Follow the guidelines for Item A3—Pumps, Pipelines, & Valves if the equipment is not on the *Accepted Equipment List*.

Inspect the sizing rolls for sanitation and maintenance. The rolls shall be smoothly surfaced and be free of nicks, scratches or gouges. Bearing assemblies and adjustment screws shall be located outside of the product zone. Check that covers are tight fitting and prevent the entrance of unfiltered air. Check the rolls for cracks. If deficiencies are noted, make the appropriate recommendations.

Item H29—Sifter (58.224, 58.246).

See the guidelines for Item D37—Sifter.

In many operations, the sifter is located prior to the sizing rolls so that only oversize product is directed to the rolls.

Item H30—Handling of Oversized Product (58.223).

The objective of the agglomeration process is to clump dry particles together to improve their wetability. It is therefore common to end up with some oversized clumps when the agglomerated products are passed through a screening process. Unlike traditional "tailings" from other dry products sifters, oversized products from instantizing systems can be used for human food, provided that these particles are not excessively scorched, "off grade," unwholesome, or mixed with extraneous materials. Generally these oversized products are directed to sizing rolls or some other size reduction equipment.

If collection containers are used for the oversized product, check that they are clean, that the products are protected from contamination from unfiltered air or other contaminants, and are not mixed with any "not-for-human-food" materials. All collection containers must be properly labeled. If contamination of the oversized product is noted, recommend disposal of the oversized product. If this is not done, recommend the INELIGIBLE status (category A deficiency).

Item H31—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Packaging

Item H33—Room Construction (58.126, 58.212, 58.213).

See the guidelines for Item D34—Room Construction.

Item H34—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item H35—Dust Control (58.211, 58.230).

See the guidelines for Item D36—Dust Control.

Item H36—Product Hoppers & Fillers (58.151, 58.229).

See the guidelines for Item G24—Packaging Machine.

Hoppers which are not an integral part of a packaging machine shall also be of sanitary construction. They shall be fitted with tight covers to protect the product from contamination. External vibratory accessories may be attached to the hopper to assist in product flow. Any internal component of the hopper shall be of sanitary design. Check the hopper for cleanliness and dry conditions. Dry-product hoppers do not require daily wet cleaning. Their product contact surfaces may be dusty but shall be free of encrusted product buildup or evidence of wet product. If unsatisfactory conditions are observed, recommend that the hopper and filler be completely disassembled, and wet cleaned. It must then be thoroughly dried before it is reassembled and used again.

Item H37—Conveyors, Scales, Vibrators (58.128a, m, 58.241).

See the guidelines for Item G25—Conveyors, Scales, Vibrators.

Item H38—Product Packaging Temp. _____ ° F (58.240).

See the guidelines for Item D41—Product Packaging Temp. _____ ° F.

Item H39—Container Make-up (58.241a, b, 58.150, 58.151, 58.152).

Empty containers shall be protected from contamination at all times. Containers that are to be lined, shall not be prepared more than an hour before filling. Except for cleanable bulk containers, containers shall not be used again. Bulk container liners shall not be reused.

Unused containers and over wrap shall be properly protected from contamination in the packaging room. These packaging items shall be kept in boxes to prevent dust and debris from

collecting on them. These boxes shall be properly identified to guard against packaging products in mislabeled containers.

Check that the container-forming equipment protects the container's product contact surfaces from contamination. The forming equipment shall be relatively clean, free from grease, oil, or accumulations of paperboard lint. Check that the forming operation does not produce airborne paperboard lint that will contaminate the packaging room.

Item H40—Sealing Equipment (58.128, 58.150, 58.151).

See the guidelines for Item G26—Sealing Equipment.

Item H41—Packaging Workmanship (58.241).

See the guidelines for Item G27—Packaging Workmanship.

Item H42—Vacuum Cleaner (58.230).

See the guidelines for Item D30—Vacuum Cleaner.

Item H43—Facilities to Clean Equipment (58.128a, 58.146a, 58.246).

See the guidelines for Item G28—Facilities to Clean Equipment.

Item H44—Reclaim Product Handling (58.152, 58.241, 58.242).

See the guidelines for Item A34—Sanitary Practices.

Deformed, improperly filled, or improperly sealed containers are often encountered during packaging start-up or during switch-overs to different packaging styles, sizes or products. The reclamation of these products should not be criticized provided that the product is collected and maintained in a sanitary and wholesome manner.

When improper handling, labeling or processing of reclaimed products is observed, make appropriate recommendations. Depending on the seriousness of the deficiency, the INELIGIBLE status may be appropriate.

Item H45—Waste Product Handling (58.127f, 58.241c).

See the guidelines for Item D43—Waste Products Handling.

Item H46—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Product Storage

Item H48—Room Construction - Warehouse (58.126, 58.210, 58.241d).

See the guidelines for Item D46—Room Construction - Warehouse.

Item H49—Lighting & Ventilation (58.126d, e).

See the guidelines for Item B54—Lighting & Ventilation.

Item H50—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item D48—Housekeeping.

General Items

See the guidelines for Page A — General Items.

Page K. Inspection of Process Cheese Operations. (Form DA - 151 - 8)

Even though plants may have a USDA approved status, much of the equipment used in the manufacture of process cheese has not been subjected to detailed design review and acceptance procedures. Many contacts with equipment manufacturers have resulted in modification and improvements to equipment designs. However, a great deal remains to be done, so it is important that any additional new or unreviewed equipment is documented on the survey report so that the progress can continue. Some equipment is covered by a grandfather exemption. Exemptions should be verified with the National Field Office.

Storage & Tempering

Item K1—Room Construction (58.126, 58.154).

See the guidelines for Items B50—Room Construction - Tempering and B51—Room Construction - Cooler(s).

Cheese tempering shall be done in an area that is clean and properly maintained. If the area is dirty or otherwise unfit for use as a tempering room, recommend the area be cleaned or the tempering be moved to an appropriate area.

Item K2—Lighting & Ventilation (58.412).

See the guidelines for Item B54—Lighting & Ventilation.

Item K3—Storage Temperature (58.126d, e, 58.412).

See the guidelines for Item B55—Temperature Control.

Bulk cheese coolers should be maintained at a temperature of 45° F or lower. If the cooler is at a higher temperature recommend it be kept at or below 45° F, also show the current temperature on the survey report. The temperature of rooms used for tempering or for the forced curing of cheese is at the discretion of the management.

Item K4—Pallets & Floor Racks (58.154).

For cheese in metal barrels and 640 pound containers with legs, it is not necessary to use pallets provided the cheese is removed from the cooler or tempering room regularly and the floor is maintained in a clean condition. All other cheese shall be stored off the floor such as on pallets, floor racks, etc. The pallets or racks are to be maintained in good condition to prevent damage to the product or containers and the storage area is to be kept clean.

Item K5—Housekeeping (58.126d, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Clear space around the perimeter of the cooler or tempering room is not required. Usually bulk cheese is kept in storage for only a limited time. This affords an opportunity for access for cleaning, maintenance, and pest control activities. After a cooler bay has been cleared, it shall be inspected by the plant, and cleaned if necessary, before reuse.

Inspect the condition of the cheese containers in the cooler. All the containers shall be properly closed and sealed. If an excessive number of containers are damaged or exposed product is present, make the following recommendations: 1) Segregate the damaged containers, and 2) Dispose of any unwholesome product.

Do not criticize the storage practices if only a limited number of containers are damaged. Such damage (from fork lift tines, etc.) is common, but recommend prompt disposal of the damaged containers. Also, do not criticize surface mold on cheese if it can be thoroughly cleaned off before processing. Product with imbedded packaging material or mold throughout (especially trim from a natural cheese cutting operation or rework from the slice department) shall be considered unwholesome. The presence of improperly stored or handled products in the plant can be a serious deficiency but should be assigned to category D if the unwholesome product is disposed of promptly (also see the guidelines for Item K19—Adequacy of Cheese Cleaning).

Optional Ingredient Handling

Item K7—Room Construction (58.126, 58.154).

See the guidelines for Item A1—Room Construction.

Item K8—Lighting & Ventilation (58.412).

See the guidelines for Item A2—Lighting & Ventilation.

Item K9—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item K10—Dairy products tanks (58.128d, 58.146).

See the guidelines for Item A29—Storage Tanks - Horizontal.

If concentrated milkfat, anhydrous milkfat, plastic cream, frozen cream, etc. is melted by the direct injection of steam, see the guidelines for Item A36—Culinary Steam. Also, the steam injectors shall comply with *3-A Sanitary Standards for Steam Injection Heaters for Milk and Milk Products, Number 61-* .

Item K11—Reconstituting Equipment (58.128, 58.146).

It is a satisfactory practice to dump a small quantity (50 pounds or less) of dry ingredients directly into the blenders, provided this is done in a sanitary manner. If a dump hopper is used, check the product handling practices and sanitation of the equipment involved using the guidelines for Item G3—Dump Hopper & Screen. Also, check the following items.

1. When dry ingredients are reconstituted, the process shall be done in a processing area or its equivalent.

2. The outer ply of the bags shall be stripped off before being dumped. If laminated bags are used, they shall be vacuumed or brushed clean before being dumped.

3. Only potable water or milk shall be used as the reconstituting liquid.

4. Pasteurization and cooling of reconstituted products is required if it is stored for more than two hours even though the cheese is later pasteurized.

5. Waste material shall be disposed of promptly and properly.

If reconstitution equipment is used, pay particular attention to the pump and valve below the funnel. Check for pitting on the impeller or pump housing, unclean backplate, seals, gaskets,

etc. If a butterfly valve is used below the funnel check it for sanitation and fabrication. If it is found unclean recommend it be replaced with a valve that meets the criteria in the 3-A Sanitary Standards.

Item K12—Storage of Other Ingredients (58.126e, 58.210, 58.241d2, 58.311).

All ingredients shall be stored on pallets, racks, or in bins and kept in a clean and orderly manner. All open bags shall be effectively closed or sealed and protected from contamination while being stored.

Clear space around the perimeter of the storage area is not required (see the guidelines for Item K5—Housekeeping).

Item K13—Operating Procedures (58.101r).

Do not criticize the normal industry practice of keeping a quantity of ingredients near the point of use. However, check to see that these ingredients are protected from contamination and are kept off the floor on pallets, racks, or in bins, etc.

All optional ingredients shall be handled in a sanitary manner and cleaned of any mold or other inedible portion before being added to the blender, melt tank or cooker. If any excessively moldy or dirty containers are noted assign the deficiency to category C. If unwholesome products are processed, assign the deficiency to category A.

Cleaning & Grinding

Item K15—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Encourage plant management to have the boxes stripped in a different room or area from where the cheese is cleaned. For bulk cheese, this may not be practical. In such cases, recommend that the air flow be from the cleaning and processing areas toward the stripping area.

To facilitate cleaning, there shall be an annular opening of at least 2-inches of clear space around hoppers, transfer chutes, etc. that pass through the floor. In addition, there shall be at least a 4-inch high curb or kick plate all the way around the opening.

Item K16—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Light protectors and at least 50 F/C of light are required where the cheese is cleaned (careful examination of the cheese surfaces is required). 30 F/C of light is required in other areas.

Item K17—Cheese Dumping (58.127e, 58.128a).

If forty pound blocks are being stripped, the cardboard boxes and the plastic liners should be removed by separate employees. The same employee can alternate between the two tasks provided hand wash facilities or a hand dip sanitizer station is readily available, and used.

A hoist is usually used to remove barrel cheese from the shipping container and to put it in a cart or on a conveyor. The plastic liner should be left in place until the cheese is ready to be cleaned (an exception to this is the bottom, which needs to be cleaned before the cheese is placed on the conveyor). The plastic liner should protect the cheese from the unsanitary areas of the motor, gear box, and chain. There shall be a bucket or catch pan under the chain drive to contain the extra chain. The chain and gear box shall be relatively free of oil. If oil is dripping onto the cheese assign the deficiency to category A. Carefully check the fabrication and maintenance of the hoist, chain, rails or tracks, and gear box. The frame and other areas shall be easily cleanable and in good repair.

If air is used to force the cheese from the shipping container (usually barrels), it shall comply with the *3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number* 604-, except that the check valve is not required. If the shut off valve is downstream from the filter required by the 3-A Accepted Practice, it shall be a sanitary design. Check the air lance for cleanup and construction. Both the interior and the exterior shall meet product contact surface requirements. The lance shall be stored in a sanitary manner between uses. If the lance is on the floor recommend it be

washed and sanitized before reuse, that proper storage be provided, and assign the deficiency to category C. If this is a repeat recommendation from a previous report assign the deficiency to category B.

Item K18—Tables & Conveyors (58.128a, 58.707).

All belt-type conveyors used as product contact surfaces shall have an endless belt (no metal stitching or lacing). All conveyors with product contact surfaces (belts, whether endless or linked plastic, bucket conveyors, auger conveyors, etc.) shall comply with the applicable 3-A Sanitary Standards or shall be reviewed and accepted by the Dairy Grading Branch (see the guidelines for Item A3—Pumps, Pipelines, & Valves).

If the conveyor discharges into a hopper or vessel or is over exposed product, all unsanitary areas shall be shielded to prevent contamination of the product below.

Product contact surfaces of tables and carts shall be made of stainless steel. Check the general cleanup and construction of the tables, carts, and conveyors. If rough welds, cracks, etc., are noted, recommend repair or replacement. Also, check the nonproduct contact surfaces. These surfaces should not contribute to unsanitary conditions and should be free of mold, crevices, open seams, unsealed holes drilled into hollow frames, etc.

Item K19—Adequacy of Cheese Cleaning (58.725).

See the guidelines for Item A34—Sanitary Practices.

The natural cheese shall be cleaned of all inedible portions. Paraffin and bandages as well as surface rind, mold, soft spots, soiled areas, or any other part which is unwholesome or deteriorated in quality shall be removed. Product with imbedded inedible material or mold throughout (especially trim from a natural cheese cutting operation or rework from the slice department) shall be considered unwholesome. If the cheese is not adequately cleaned before processing, make an appropriate recommendation. If cleaning of the cheese remains inadequate assign this deficiency to category A.

Item K20—Disposition of Scrap (58.127f).

See the guidelines for Item A34—Sanitary Practices.

Item K21—Grinder Feeding Equipment (58.128a, 58.707).

See the guidelines for Item K18—Tables & Conveyors if a conveyor is used.

Include all harps, knives, hydraulic pushers, etc. under this item. The product contact surfaces of these pieces of equipment shall be of sanitary construction, in good repair, and be easily cleaned. Recommend correction of any deficiencies such as cracks, rough welds, exposed threads, improper radii, etc.

Pay close attention to any pneumatic or hydraulic cylinders. To protect the cheese from contamination, any part of the shaft that enters the cylinder and extends over exposed product or a product contact surface shall be provided with sanitary shields or comply with sanitary design requirements. The sanitary shielding can be accomplished with a long drip plate (so that all exposed product and product contact surfaces are shielded when the shaft is fully extended), or any other shield arrangement that protects the surfaces and cheese. Sanitary designs include; double seals (with 1-inch of clear space between them, provided the space between the seals is not in the product zone); doubling the length of the shaft so the part that enters the cylinder never extends over the product zone; and other options. If you have any doubts or questions concerning the design, contact the National Field Office for assistance. This deficiency does not have a grandfather exemption. If the cylinder shaft is clean, assign this deficiency to Category D. If the cylinder shaft is not clean, assign it to Category C.

Steel wires are often used in harps because of breakage problems with stainless steel wires. Such nonstainless steel wires should not be criticized if maintained in a clean and rust free condition (a light coating of mineral oil after cleaning will prevent rust). Dirty or rusty wires are unsatisfactory, recommend cleaning or replacement.

Item K22—Grinders or Extruders (58.128a, 58.708, 58.726).

Even though grinders may be large, heavy pieces of equipment, arrange for dismantling to the extent necessary to determine if it is clean and in good repair. Pay particular attention to rotary knives, augers, extruder plates, and drive seals. Look for cracks, crevices, nicks, or pits in the screen, knives and augers. Grinders with cast iron end plates and bolted screens do not have a grandfather exemption. If this type of grinder is noted, recommend replacement and assign the deficiency to category B.

Item K23—Conveyor for Ground Cheese (58.128a, 58.418b, 58.707).

See the guidelines for Item K18—Tables & Conveyors if a mechanical conveyor is used.

See the guidelines for Item C47—Hooping Equipment if the ground cheese is conveyed pneumatically.

Look carefully at the discharge end of the conveyor. This area is often in a product zone and must meet all the requirements of a product contact surface or be adequately shielded.

Item K24—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese knives, scrapers, etc. should be stored neatly and in a sanitary manner when not in use.

Paper, plastic, cardboard, and other waste shall be picked up and removed regularly. The floor should be relatively clean and free of cheese scrapings during production. When excessive buildup of cheese is noted, recommend the floor be cleaned and assign the deficiency to category D.

Blending & Cooking

Item K26—Room Construction (58.126, 58.146d).

See the guidelines for Item A1—Room Construction.

Check areas above exposed product in blenders, conveyors, hoppers, etc. (ceilings, pipelines, service lines, duct work, exhaust fans, etc.) for peeling paint or condensation that might drop or drip into the cheese or on the equipment. If condensate is dripping from ceiling air conditioners or fans recommend that catch pans be provided. If condensate is observed dripping onto product or product contact surfaces assign the deficiency to category A and assign the INELIGIBLE status until the deficiency is corrected.

To facilitate cleaning, there shall be an annular opening of at least 2-inches of clear space around hoppers, transfer chutes, etc. that pass through the floor. In addition, there shall be at least a 4-inch high curb or kick plate all the way around the opening.

Item K27—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Light protectors and at least 30 F/C of light are required.

All openings to the outside shall be screened except that exhaust fans shall have screens or self closing louvers.

Item K28—Ground Cheese Blenders (58.128a, 58.727).

Dismantle and inspect the ribbon shaft seals for cleanup and condition. The seals shall be accessible for cleaning. This will usually require split seals that are removable for hand cleaning. Adequate manual cleaning can sometimes be obtained with seals that are not split by pushing them along the shaft away from the blender to clean them. Seals made of braided material are not acceptable (category C).

The ribbon flights and blender interior will sometimes rub together which leaves the interior of the blender scored and the ribbons with knurled or wire edges. If this has happened, recommend these areas be polished. Depending on the extent of the damage the deficiency can be assigned to category B, C, or D (use your judgement based on the potential contamination of the product by metal). Also, recommend checking and, if necessary, replacing the bearings.

Blenders are often placed directly above the cooker or a transfer hopper so that when the doors open the cheese flows by gravity out of the blender. If this is the case, the doors and all areas directly above the exposed product areas shall meet product contact requirements (No. 4 finish, no rough welds, threads, or crevices, etc.) or be adequately shielded. Older blenders that have

a grandfather exemption may require some modifications to meet this requirement. If the deficiencies are related to the obsolete design assign them to category D. However, if the deficiencies are related to a lax sanitation or maintenance routine, or constitute a possible public health hazard, assign them to category A, B, or C as appropriate.

Item K29—Conveyor - Blender to Cooker (58.128a, 58.707).

See the guidelines for Item K18—Tables & Conveyors if a mechanical conveyor is used.

See the guidelines for Item C47—Hooping Equipment if the ground cheese is conveyed pneumatically.

Look carefully at the discharge end of the conveyor. This area is often in a product zone and must meet all the requirements of a product contact surface or be adequately shielded.

Item K30—Positive Cut-off to Cooker (58.728).

Means shall be provided to prevent the entrance of cheese particles or ingredients after the cooker batch of cheese has reached the final heating temperature.

Show N/A for this item if the plant has a continuous cooker.

Item K31—Cheese Cookers (58.128a, 58.709).

Continuous cookers shall meet *3-A Sanitary Standards for Scraped Surface Heat Exchangers, Number* 31-. Other types shall be reviewed and accepted by the Dairy Grading Branch.

Steam that is injected into the product at the cookers shall comply with the *3-A Accepted Practice for a Method of Producing Steam of Culinary Quality, Number* 609-. This requires stainless steel tubing and fittings from the outlet of the last filter to the sanitary check valve and sanitary construction (tri-clamps, no threads) from the sanitary check valve to the processing equipment. This standard does not allow for flexible plastic lines covered with exposed braided stainless steel. If a plant is using this type of flexible connector, recommend they be replaced with acceptable connectors.

Remove and dismantle the steam injectors and check for cleanup, condition, and compliance with *3-A Sanitary Standards for Steam Injection Heaters for Milk and Milk Products, Number* 61-. Most process cheese cookers have steam injectors that are also check valves. Therefore, the steam line can be threaded between the filter and the steam injectors.

Check the auger bushings, auger flights, hanger bushings, seals, and discharge area for cleanup and condition. The auger flights and cooker interior will sometimes rub together which leaves the interior of the cooker scored and the auger with rough or wire edges. If this has happened, follow the guidelines for Item K28 —Ground Cheese Blenders.

If the cooker discharges directly into a hopper, the outlet doors and all other areas over the exposed product shall meet the criteria of product contact surfaces, and there shall be proper shielding for the air cylinders and any other unsanitary area. Follow the guidelines for Item K28—Ground Cheese Blenders.

If the plant has a continuous cooking system, ask that a representative number of the cylinders be opened and pull the rotors (dashers) out. If excessive pitting or scoring of the cylinder walls is noted assign this deficiency to category C. Check the cleanup of the rotor and seals, and that the scraper blades are made of an approved material and are in good repair (use caution when inspecting stainless steel scraper blades as these may be very sharp). Some scraper blades are made of 400 series stainless steel, and will be slightly magnetic.

Item K32—Vapor Exhaust at Cookers (58.126d2).

The hot vapors are sometimes piped to the outside through ducts. Check the cleanup and condition of these ducts. Pay special attention to any areas above exposed product or product contact surfaces. The product contact surface extends from the beginning of the duct to the point where the duct slopes downward, away from the product. The product contact surfaces of the ducts should be designed to be easily cleanable and inspectable.

The discharge end shall have a screen or self-closer. If possible, check the discharge area for unsanitary conditions such as product residues and foul odors.

Item K33—Control of Cheese Cooking (58.728).

See the guidelines for Item B—6 HTST or Vat Pasteurizer.

An indicating thermometer and a recording thermometer are required to ensure the cheese is pasteurized (a digital thermometer is acceptable provided it has a separate well in the cooker). Check current processing charts, 158° F for 30 seconds is required in USDA approved plants. The charts should be marked as outlined for vat pasteurizers in Item B6.

Item K34—Cheese Hoppers (58.128a).

Often the cheese flows by gravity from the cooker into a hopper directly below. The hopper may or may not have a scraper or agitator but it shall have a tight fitting cover. If an agitator is used, it shall have a slinger or other protection for the opening. Also, the opening shall have a ⅜-inches upward flange. Check the connection between the agitator shaft and the scraper blades for sanitary construction (no threads, bolts, cracks, rough welds, etc.) and for cleanup.

Item K35—Cheese Pumps, Pipes, Strainer (58.128, 58.710).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

A positive displacement pump is often used to pump the hot cheese from the hopper to the packaging machine. The pump shall comply with the *3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps for Milk and Milk Products, Number 04-.*

Item K36—Misc. Equipment & Utensils (58.128a).

Scrapers, knives, brushes, green pads, etc. shall be clean, in good condition, and shall be stored in a sanitary manner when not in use (steel wool or metal sponges shall not be used in the cleaning of dairy equipment or utensils). If wooden handles are noted, recommend replacement with utensils that have handles made of plastic or other impervious material. Hollow handles shall be sealed at both ends.

Item K37—Hand Washing Facilities (58.127f).

See the guidelines for Item B21—Hand Washing Facilities.

Item K38—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Filling & Packaging

Item K42—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Pay particular attention to the ceiling above the slice line (if applicable), the packaging machine hopper, and anywhere there is exposed product. Check for loose paint, condensate, mold, etc.

To facilitate cleaning, there shall be an annular opening of at least 2-inches of clear space around hoppers, transfer chutes, etc. that pass through the floor. In addition, there shall be at least a 4-inch high curb or kick plate all the way around the opening.

Item K43—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item K44—Fillers & Hoppers (58.128a, 58.710, 58.730).

New or replacement fillers shall comply with the 3-A Sanitary Standards for Equipment for Packaging Viscous Products, Number 23-.

Most fillers require disassembly for hand cleaning. Carefully check the shutoff valve, agitator, piston, and other parts for sanitation and cleanup. Many of these parts may be made of plastic. However, all product contact surfaces, whether they are stainless steel or plastic, shall be as smooth as a No. 4 finish with no cracks or crevices, and with the proper radii.

All the conveyors of the filler and caser shall be easily cleanable. Recommend the use of an endless-type belt to facilitate cleanup of any spills.

Item K45—Wrapper Sealing & Package Coding (58.150, 58.152, 58.731).

Pouches, liners, or containers having product contact surfaces, shall be folded after filling or closed and sealed in a sanitary manner, preferably by mechanical means, so as to protect the product from contamination. Equipment shall be provided for coding the containers with lot or sublot numbers when required.

Item K46—Slice Line Operations (58.128a, 58.730, 58.731).

Look carefully at the header where the cheese flows onto the belt or drum, and at the system used to spray anti-sticking agents on the belt or cheese. These are often in the product zone. Therefore, the exterior must meet the requirements of a product contact surface or be adequately shielded. Because the anti-sticking agents are not dairy ingredients (usually lecithin or mineral oil is used) the interior of the system does not have to meet product contact requirements.

Also look at the scraper blades, cutters, guide rollers, etc., for sanitation and condition. Make appropriate recommendations. These pieces shall be made of stainless steel or approved plastic. Many slice line machines have a large amount of exposed product as the cheese travels across the top belt. Because of this added risk of contamination check the room (especially the area directly above the slice line) for mold and other unsanitary conditions.

Visually check the cooling media for signs of debris or other contamination. Also, check for areas where the cooling media can drip or drain onto the lower belts.

Clean and sanitary containers, carts, or single service poly liners shall be provided to collect the rework cheese during start-up, shutdown, and breakdown periods (see Item A34—Sanitary Practices and Item N28—Handling of Trim).

Item K47—Handling of Damaged Packages (58.124, 58.730).

Misshapen or leaking packages may be salvaged into sanitary containers or single service poly liners and added back to the cooker. If the rework is not added to the cooker promptly, it shall be covered and placed in refrigerated storage.

If the damaged containers are contaminated with embedded packaging material, extraneous material, or have come into contact with unsanitary surfaces, they shall be disposed of, in clearly marked containers, as waste (see the guidelines for Items A34—Sanitary Practices and K5—Housekeeping). Observe the reclaim operations during production if possible to determine if they are carried out in a sanitary manner. Make recommendations as necessary.

Item K48—Hand Washing Facilities (58.127c).

See the guidelines for Item B21—Hand Washing Facilities.

Item K49—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Check that all areas are kept relatively neat and clean with adequate dust control. Do not criticize the practice of having extra pouches, labels, film, etc. in the packaging room if the supplies are kept neat, protected from contamination, and limited to about one days production or less.

Misc. Items

Item K51—Handling of Trim & Rework (58.124, 58.725, 58.730).

In order for cheese trim generated by a USDA approved cheese cutting operation to be used in the manufacture of other approved cheese products, the cutting operation must be listed in Section I of the *Approved Plant Book* with the product code for "Natural Cheese Trim" (see the guidelines for Item N28—Handling of Trim). Alternately, the cheese trim shall be produced under continuous inspection and be covered by a certificate.

Item K52—Barrel Washing & Storage (58.418e).

The washer, if provided, shall be constructed so that it can be satisfactorily cleaned. It shall also be equipped with temperature and pressure controls to insure satisfactory cleaning of the barrels. The washer should be adequately vented to the outside. The wash water should be changed frequently enough to prevent debris from accumulating in the tank.

The empty barrels or 640's (plastic or wood) shall be stored in an enclosed, clean, dry area. When barrels are not properly stored make a recommendation for correction.

Item K53—Condition of Barrels (58.128a, 58.150).

When applicable, check the condition of the barrels or 640's in use.

Some barrels are constructed of steel, are poly lined, contain approximately 500 pounds of cheese, and require cleaning and paraffining after each use to be maintained in good condition. When barrels are rusty, in poor repair, not clean, or in need for reconditioning, make a recommendation for correction. Indicate how many barrels were inspected and how many were found unsatisfactory.

When plastic 640's are noted with cracks, missing legs, etc., recommend they be removed from service.

Item K54—Carton Make-up Equipment (58.729).

Lined containers shall be protected from possible contamination prior to filling. When lined boxes are not used the same day, check that the liners are removed and discarded.

A separate room should be provided for the carton make-up equipment to control contaminates and lint. Equipment outside the processing area does not need to meet the same requirements as equipment in a processing room but it should not contribute to any unsanitary conditions in the plant. The equipment should be clean and in good repair.

Product Storage

Item K56—Room Construction - Coolers (58.126, 58.154, 58.412).

See the guidelines for Item B51—Room Construction - Coolers.

There should be adequate facilities to cool the cheese to less than 100° F within 24 hours. Do not criticize slow cooling practices when the plant is processing slow melt or no melt cheeses.

Item K57—Lighting & Ventilation (58.126d, e, 58.412).

See the guidelines for Items B54—Lighting & Ventilation and C58—Lighting & Ventilation.

Item K58—Temperature Control (58.412, 58,510d).

See the guidelines for Item B55—Temperature Control.

Item K59—Housekeeping (58.126e, 58.127f, 58.146d, 58.154).

See the guidelines for Item C60—Housekeeping.

General Items

See the guidelines for Page A — General Items.

Page L. Miscellaneous. (Form DA - 151 - 9)

Page M. Inspection of Membrane Processing Operations. (Form DA - 151 - 10)

These guidelines are to be used for the inspection of all membrane processing systems. However, recommendations concerning the salty whey should be listed under the appropriate item on Page W on the report. Also, additional Inspection guidance for salty whey membrane processing is provided on Page W.

Processing

Item M1—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

A separate room for membrane processing is not required. Membrane processing may be conducted in any processing area where the equipment can be installed in such a fashion as to permit proper operation and cleaning of all the equipment and facilities in the room. Membrane processing may be in the same room as pasteurization, cheese making, whey processing, etc.

Item M2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item M3—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item M4—Separator (58.128e).

See the guidelines for Item B4—Separator.

Item M5—HTST Sealed _____ at _____ sec, _____ ° F (58.128, 58.809).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec, _____ ° F.

Products emanating from membrane processing systems shall be pasteurized at a suitable location to destroy pathogenic organisms and safeguard the public health. The pasteurization

step may be prior to or following the membrane processing equipment. The location is at the option of the processor. Regardless of the location, pasteurization shall be accomplished at the processing plant. If pasteurization is not conducted in timed and sealed equipment recommend the INELIGIBLE status be assigned (category A deficiency).

Plant management should be advised that some regulatory and inspection agencies require the pasteurization step always be located prior to membrane processing. They may wish to consider this aspect when modifying their system.

Item M6—HTST Equipment (58.128 58.809).

See the guidelines for Item B6—HTST or Vat Pasteurizer.

Item M7—Product Cooler (58.128i, j, k).

See the guidelines for Item A27—Product Cooler. See the guidelines for Item A38—Water Supplies & Handling if nonpotable heat exchange media is used.

If products are membrane processed within two hours, special cooling may not be required. However, if products are held for longer periods or if the specific process requires cooling, product coolers prior to processing or storage shall be present.

If products are held for longer than two hours and no coolers are provided, or if not cooled to below 45° F recommend that product coolers be provided. When products are being run continuously, an alternative is to provide dual tanks that can be alternately used and cleaned.

Item M8—Storage Tank(s) (58.128d).

See the guidelines for Item W10—Storage Tank(s). When used as the surge (feed) tank(s) for the system see the guidelines for Item M14—Surge Tank.

The product shall be cooled to below 45° F or heated to above 145° F, or two tanks shall be provided and alternated so that they are cleaned and sanitized after approximately 4 hours of use. In-out storage of products between these temperatures is not acceptable.

Item M9—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Membrane Processing

Item M11—Room Construction (58.126).

See the guidelines for Items A1—Room Construction and M1—Room Construction.

Item M12—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item M13—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Butterfly valves have commonly been used on membrane processing systems. Recommend replacement with valves that meet the 3-A Sanitary Standards when unsatisfactory conditions are observed or when the valves are included in a CIP system without daily disassembly and hand cleaning.

All membrane systems operate at elevated pressures. UF systems operate in the 30 – 300 PSI range whereas RO systems operate at pressures of 600 PSI and above. Therefore, all systems utilize a pressure regulator valve.

When bladder style pulsation dampeners are used in conjunction with high pressure systems, ensure that all of the pressure has been released from both sides of the bladder before asking that the dampener be disassembled for inspection. For safety, request that the air line be disconnected.

When a recirculation line is provided that continuously takes some finished product back to the surge tank or the first stage in a multistage system, recommend the INELIGIBLE status until the flow pattern is corrected (if the product is pasteurized prior to the membrane system this deficiency can be assigned to category B). Although this line is needed during start up, shut down, and the CIP cycle, it is not necessary to use such a loop during normal production, which increases average residence time significantly. Finished product concentration can be controlled by other means, such as control of the product in-feed and removal from the system.

During the survey, verify that no product is recirculated during production. The plant can disconnect the line or use a divert valve that is programmed to bypass the system during production. Contact the National Field Office if other methods are used. In addition, these lines, when used, shall be close-coupled to the balance tank or removed during production. If removed, the line shall be kept as short as possible and be hand washed prior to reconnecting and reuse (see the guidelines for Item M17—Product Processing Temperature).

Item M14—Surge Tank (58.128d).

The surge tank is generally the beginning of the membrane processing system. The "system" shall meet the criteria in the *3-A Accepted Practices for The Sanitary Construction, Installation, and Cleaning of Cross Flow Membrane Processing Systems for Milk and Milk Products, Number 610-* . As appropriate, follow these 3-A criteria for the evaluation of subsequent component parts of the system.

Typically the temperature in the surge tank will be between 45° F and 145° F. At this temperature bacterial problems develop in the foam in the tank. Therefore, two tanks shall be provided and alternated so that they are cleaned and sanitized after approximately 4 hours of use. In-out storage of products between these temperatures is not acceptable.

When storage tanks are used as the surge (feed) tanks, see the guidelines for Item M8—Storage Tank(s).

Some membrane manufacturers supply an integrated system that includes a single small balance tank at the beginning. This is acceptable provided that it meets the requirements of Section F.1 of the *3-A Accepted Practices for the Sanitary Construction, Installation Testing and Operation of High-Temperature Short-Time and Higher-Heat Shorter-Time Pasteurizer Systems, Number 603-07*. The main points to check during a routine survey are:

1. the average residence time shall be less than 4 minutes (i.e., a small tank such as those used for HTST balance tanks). Membrane systems that require a much larger flow during the CIP cycle can have a dual level control to maintain an average residence time of less than 4 minutes during production.

2. the inlet effectively minimizes the development of foam (e.g., an inlet that enters below the level of the product in the tank or a "gooseneck").

3. the contents drain to the outlet before the outlet is uncovered.

Systems with a balance tank that develops a thick layer of foam, or with an average residence time of greater than 4 minutes during production, are not acceptable.

Note:

A single, small balance tank cannot replace the two storage (surge) tanks that are required when the processing temperature is between 45° F and 145° F.

The design of the float assembly shall be easy to disassemble without the need for special tools or the use of nuts and bolts, cotter pins, snap rings or similar hard to remove fastening devices. Inspect the surge tank and level control parts for sanitation and condition. If the tank has a mechanical float control assembly, take it apart for inspection. The tank shall be provided with covers, which shall be in place during operation and be easily removable for cleaning or designed to clean in place.

All inlets into the surge tank shall be stainless steel and of sanitary construction. Black iron, copper, and threaded fittings for water are not acceptable. Water lines shall be installed in accordance with local plumbing codes, with an effective backflow preventer or an air gap equal to at least two pipe diameters, to protect the potable water supply. Steam shall comply with the criteria of the *3-A Accepted Practices for a Method of Producing Steam of Culinary Quality, Number 609-* . Steam inlets shall comply with the *3-A Sanitary Standards for Steam Injection Heaters for Milk and Milk Products, Number 61-* . The steam injector can be the check valve required by the Accepted Practice. Therefore, the steam line can be threaded into the injector. Have the injectors dismantled and check for sanitary construction and cleanup of the interior.

Item M15—Prefilter(s) (58.128a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item M16—High Pressure Pump (58.128, 58.219).

When a piston type high pressure pump is used, follow the appropriate guidance of Item D19—High Pressure Pump.

Often the high pressures required for membrane processes can be obtained by special centrifugal type pumps. Two primary methods are used to achieve the pressures required, two or more standard centrifugal pumps in series, and multistage centrifugal pumps. When connected in series, the discharge of one standard centrifugal pump is connected directly to the intake of the next pump to obtain the desired pressures. Multistage pumps accomplish the same pressures within a single pump housing. The pumps used in either configuration shall meet the criteria of the *3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps for Milk and Milk Products, Number 02-* . See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Disassemble and check the pumps for sanitation and condition. Pumps shall be specifically designed for CIP applications or be disassembled for daily hand cleaning. Carefully check multistage pumps for ease of disassembly and cleaning between the various stages.

Note:

Piston style high pressure pumps (homogenizers) are not suitable for CIP applications.

Item M17—Product Processing Temperature (58.810a).

Unless processed within 2 hours, the product shall be cooled to 45° F or lower or heated to 145° F or higher. Some whey products are exempt from this requirement, see the guidelines for Item W8—Whey Heating or Cooling. Salty whey shall be cooled to 45° F or lower or heated to 125° F or higher and processed at a minimum of 125° F. There is no heating or cooling requirement for acid whey with a pH of 4.6 or below or titratable acidity of .40 or above (whey from cottage cheese, cream cheese, etc.).

It is common practice to operate dairy membrane systems continuously at warm temperatures because of the higher flux rates that can be obtained. When processed promptly, these temperatures should not be criticized provided the system is designed and sized to provide as short a residence time as possible for the product being processed. Do not criticize intra-stage recirculation loops in multistage systems. Such recirculation loops are necessary to achieve the required cross-flow velocity at the surface of the membranes to prevent fouling. See the guidelines for Item M13—Pumps, Pipelines, & Valves.

Do not criticize recirculation loops for batch processing systems. These systems utilize full recirculation of all product back to the batch tank over a period of several hours in order to achieve the desired final concentration. Batch systems generally require very long residence times. Therefore, bacterial control measures are required. Do not criticize the use of safe and suitable pH adjustment chemicals or the addition of benzoyl or hydrogen peroxide in batch systems as processing aids.

Item M18—Membrane Modules (58.128 a, o).

All membranes shall comply with the criteria of the *3-A Sanitary Standards for Cross-flow Membrane Modules, Number 45*- . Refer to this standard for component part descriptions and diagrams of construction of the various types of membrane modules.

Membrane modules can be classified by pore size. Three types are common in the dairy industry, reverse osmosis (RO) (water removal), nanofiltration (NF) (salt and water removal), and ultrafiltration (UF) (lactose, salt, and water removal leaving concentrated protein). In addition, membrane systems can be classified by the configuration of the modules. These configurations include tubular, spiral wound, plate and frame, parallel leaf, hollow fiber, and ceramic. All these configurations are generally designed similar to a plate type heat exchanger. Product flow is directed into a series of “passes.” The flow will proceed through a group of membrane surfaces (the modules) and then be directed to the next grouping of surfaces. This is most clearly demonstrated on the plate and frame styles but is also used in other styles by arranging the manifold piping.

General Instructions for Selecting a Membrane for Inspection.

All evaluations of membrane surface cleanability may result in damage to the membrane module. Fortunately, some membrane module designs can be inspected without destroying the membrane. Ceramic, plate and frame, and parallel leaf are resistant to damage. However, in the case of the spiral wound and tubular membranes, some will require cutting in order to inspect the internal permeate transport materials.

A. Plants with a Single Membrane System.

When selecting membrane modules for examination, refer to the membrane log (see the guidelines for Item M28—Membrane Module Log) and select from among the membrane modules at the end of each “pass” that have been in service for the longest period. These

lower flow areas have a greater potential for inadequate cleaning. Pay special attention to the final stages of multistage systems as these areas have the highest product concentrations and associated, potential cleaning problems.

Select a minimum of 3 modules. Pay special attention to identified problem areas that have been observed on prior inspections. Visually inspect all surfaces available without damage or destruction of the three modules. If defects such as folds, irregular glue lines, holes, etc., are noted on one of the modules, select that module for further inspection. If no visible defects are noted, select one of the three at random for further destructive inspection. Record any deficiencies noted during the inspection of the module, no further action is required on the other modules from this system. When a plant has established a history of satisfactory cleaning and fabrication, destructive inspection of the modules can be reduced to one module every other survey. A visual inspection of 3 modules is still required each survey and any module with visible defects should be subjected to destructive inspection techniques.

B. Plants With Multiple Membrane Systems.

Following the guidelines for a single system above, select a minimum of 3 modules from each system.

When a plant with two systems has established a history of satisfactory cleaning and fabrication, destructive inspection of the modules can be reduced to not less than 1 module each survey. A module shall be selected from each system with an unsatisfactory history. When a satisfactory history has been established, select a module from alternating satisfactory systems for destructive inspection. However, be prepared to increase the number of modules if the following circumstances are encountered:

1. If the module scheduled to be cut is not clean.

2. If the module scheduled to be cut is found to have interior fabrication deficiencies that were undetectable during the visual, nondestructive examination.

3. If any of the modules from the system not scheduled to be cut appear to have fabrication deficiencies.

4. If flux rate tests indicate possible fouling of the membranes (see the guidelines for Item M27—Flux Test Reports).

A module from another system shall be selected to be cut to determine whether the deficiency is isolated or involves more than the initial system.

When the above circumstances are encountered in plants with three or more systems, a minimum of 2 membranes shall be cut. Select 3 modules from each system for visual inspection. However, only 2 modules need to be subjected to destructive inspection techniques. If both modules are satisfactory, the systems can be alternated on future surveys with the system not selected during this survey being 1 of the 2 selected during the next survey.

Any system that does not have a satisfactory history shall have a membrane cut each survey until a satisfactory history is reestablished.

Example 1: (If the membrane systems are on a single Page M)

M18. — RO and UF modules satisfactory this survey.

These systems have a satisfactory history. During the next survey 3 modules shall be selected from each system. A minimum of one module shall be cut. The next survey should have a comment such as:

M18. — RO module satisfactory this survey, visual inspection of UF module was satisfactory.

Example 2: (If the membrane systems are each on a separate Page M)

(Page M for the UF system)
M18. — UF modules satisfactory last survey. Visual inspection was satisfactory this survey.

(Page M for the RO system)
M18. — RO modules satisfactory this survey

Because these systems have a satisfactory history, during the next survey 3 RO and 3 UF modules shall be selected for inspection and a UF module shall be cut.

Example 3: (If the membrane systems are each on a separate Page M)

(Page M for the UF system)
M18. — Provide modules that meet the 3-A Sanitary Standards. Numerous blisters with clear liquid noted on glue seams (C).

(Page M for the RO system)
M18. — Modules satisfactory this survey.

In this example, the UF system does not have a satisfactory history while the RO system has established a satisfactory history. Therefore, during the next survey 3 modules shall be selected from each system and a module from the UF system shall be cut.

Example 4: (If the membrane systems are each on a separate Page M)

(Page M for the UF system)
M18. — Provide modules that meet the 3-A Sanitary Standards. Holes in the membrane surface have been repaired with glue (C).

(Page M for the RO system)

M18. — Provide modules that meet the 3-A Sanitary Standards. Numerous blisters noted on glue seams (C).

In this example both systems have a fabrication deficiency, therefore, a module from each system shall be cut during the next survey to reestablish a satisfactory history. If the plant had an additional system with a satisfactory history, a module from it would not have to be cut.

General Guidelines for all Membrane Systems Concerning Cleaning Deficiencies.

Membrane systems are extremely difficult to clean. The basic design of the membranes results in their ability to capture soil and impurities from the water supply and cleaning compounds. It is important, therefore, to use extremely clean water to make cleaning solutions. The cleaning solution compounds for membrane system cleaning are usually specially formulated to specifications provided by the membrane manufacturer or by the company which provides cleaning expertise. The choice of cleaning compounds and cleaning temperatures are at the discretion of the plant and the membrane supplier.

Membrane systems do not lend themselves to manual cleaning operations. Therefore, an automated CIP system shall be provided to clean the membranes, manifold, permeate collection system and the retentate collection system. The CIP cycle shall be controlled automatically to regulate temperatures, times, cleaning solution addition and rinse sequences.

In addition, the plant shall provide and post for the operator a detailed cleaning procedure. The procedure shall include the manufacturers recommended cleaning compounds, times and temperatures to be used during cleaning and sanitizing of the membrane system.

Check the system to determine that the necessary controls are present and used. If it is found that the cleaning is dependent on the manual adjustment of times, temperatures or cleaning compound addition, Item M41—CIP System(s) is unsatisfactory, recommend the APPROVED 3-MONTHS status (category B deficiency). Make the recommendation that automatic controls be provided and used to control cleaning. This should not be taken to preclude a manual titration of enzyme strength, pH, etc. to verify the automatic controls.

Membrane surfaces shall be clean. They shall be free of yellow or white slimy residues, milk or milk product residues, off odors such as sour, fermented, or yeasty, etc. (category A deficiencies) Even though the oldest membranes are selected for examination there shall be no allowances for observed defects. Regardless of their age, membranes in use are expected to be clean.

During inspections of RO and UF installations a grayish to light brown or tan film has been observed on the membrane surfaces. They may originate from the water supply or the cleaning compounds. This film has been analyzed as an inorganic deposit consisting primarily of silicates. Although not as serious as organic soil, such mineral films should not be present on the membrane surfaces (category B deficiencies). They can be eliminated by alteration of the cleaning procedures or compounds. Even though there are not high bacterial levels in this film,

it is our policy that the membranes are to be physically cleaned of all deposits during the CIP cycle.

When deposits are noted on RO and UF membrane systems during inspections, it is appropriate to recommend that the cleaning cycle be modified to eliminate the film deposits and to inform the plant that the manufacturer should assist them in making the necessary corrections.

When cleaning or rinsing problems are noted, describe them accurately and in detail so the plant can take effective corrective action and the deficiencies can be reevaluated during the next survey.

Inspection of Membrane Systems.

Following is inspection guidance for the various styles of membrane modules.

A. Tubular.

The inside diameter of membrane tubes shall be no smaller than 0.2 inches. Tubes may be either singular or installed in multiple groups within the membrane housing. The tubes may be inserted within a metal or plastic support tube or have the support material as an integral part of the tube.

Disassemble the membrane support housing. This will include some type of end cap or elbow arrangement. Check for product residues and deteriorated or improperly installed gaskets, O-rings, membrane retainers, etc. Using your flash light, look down the length of the membrane tube. Make appropriate recommendations if product residue, stains, discolorations, sediments, films, buckled or torn membranes, or other improper conditions are observed. Select and remove designated tubes from the housing and cut them lengthwise so that they may be opened flat to examine all surfaces. Check for the defects listed above as well as for blisters, or delamination of the membrane surfaces and improper cleaning of the membrane attachment areas. Smell the membranes for any off odors indicative of improper cleaning.

B. Spiral Wound.

These are the most popular type of dairy membrane modules in use. They are manufactured by a variety of companies. Check that the module meets the *3-A Sanitary Standards for Crossflow Membrane Modules, Number 45* - .

Disassemble the membrane support housing and remove the membrane modules. Check the end caps for proper design and construction, product residues, deteriorated or improperly installed gaskets, O-rings, anti-telescoping devices (ATD), interconnectors, and seals. As the membrane modules are removed, observe if the operating conditions have caused the rolled membranes to telescope (push out of alignment) or caused the outer shrouds to wrinkle or bunch up. Do not criticize minor telescoping or wrinkles. Wrinkles or bunched up shroud

material that impede product or cleaning solution flow is unsatisfactory (category D). The permeate tube shall be free of rough cut edges, cracks, and burrs.

Check the condition of the interconnectors. Interconnectors may have the ATD as an integral part. Check for product residues on interior surfaces, cracks, torn or missing surfaces and deteriorated or missing O-rings.

Take the selected membrane(s) to a flat table where they can be cut open. If there is an outer shroud, remove it and unroll the membrane leaves. Spiral wound membrane modules generally have more than one layer of membrane surfaces rolled into the spiral. Carefully check the membrane surfaces for product residues, sediments, films, and indications of improper cleaning or low flow areas, especially in the area of the permeate tube. Older membranes may crack or deteriorate as they are unwound. Do not criticize this unless there is evidence that the membrane failed while in its normal operating configuration (rolled). Evidence of deterioration prior to unrolling shall be considered a category C deficiency. Smell the surfaces for off odors indicative of improper cleaning.

When checking the workmanship of the modules look for the following items:

1. The glue lines attaching the membrane to the support and permeate transport material should be generally uniform and shall not create hooks, folds, recesses or other areas that will impede liquid or cleaning solution flow. Wide glue areas that are free of defects do not have sanitary significance and should not be criticized. They only reduce the module efficiency by reducing effective membrane surface area.

   The glue lines shall be smooth, with no blistering, crevices or delamination. Blistering and other problems with the glue lines indicate that the membrane manufacturer experienced problems during production. Therefore, to give the plant time make the necessary corrections, blisters in the glue seams that contain only clear liquid should be noted on the report as a category C deficiency. However, blisters that contain discolored liquid or product shall be considered a category A deficiency.

2. Holes or defects in the membrane surface (except when located on a glue seam) decrease the efficiency of the module but have no sanitary significance. However, look for glue spots in the middle of the membrane sheet as small imperfections will sometimes be repaired in this manor. These repairs do have a sanitary significance because they create "shadow" that may restrict flow of CIP solutions. Therefore, defects that have been repaired by gluing the membrane material to the permeate carrier below, and holes in the membrane material on the glue seams, shall be noted on the report and assigned to category C. Repairs that cause the membrane surface or the permeate carrier material to be unclean shall be assigned to category A.

3. Check the area where the open weave membrane spacer materials ends near the crease in the membrane surfaces. These may be loose, glued, or fastened into place by various means.

If loose, they are to be as close as possible to the permeate collection tube at the center to avoid any dead flow areas created by two membrane surfaces touching each other. Check these areas carefully because the flow is sometimes restricted, which can create a hard to clean area.

If glued, check that the glue lines are properly applied and that they do not obstruct any of the permeate drain holes in the permeate tube.

Other methods of attachment may be acceptable, if you have any questions contact the National Field Office for assistance. Check the permeate tube for rough cut edges, cracks and for residue remaining from drilling the permeate drain holes.

4. The crease in the membrane material is usually strengthened with crease protection materials such as glue or tape.

   If tape is used, check that the bond is continuous and tight across the entire length. Tape that has come loose should be assigned to category D. If product is present under the tape, assign the deficiency to category A.

5. Cut the membrane surfaces so the permeate surfaces and transport material can be examined. The permeate carrier material will end at the permeate tube. The 3-A Sanitary Standard allows the permeate carrier materials to be stitched together. It also allows these materials to be attached to the permeate tube by intermittent ultrasonic attachment (i.e., the permeate material will be melted to the tube at several points).

If any deficiencies are noted, but the membrane is clean, assign them to category D with a recommendation to provide modules the meet the 3-A Sanitary Standards.

C. Plate and Frame.

Plate and frame style membrane systems can be inspected using essentially the same techniques as a plate and frame heat exchanger. After the clamping bolts have been removed, the individual membrane elements can be separated and inspected.

As stated earlier, the product flow through these systems is based on a series of “passes.” Carefully inspect the membrane elements located at the end of the “passes.” They have the greatest potential for product residues or evidence of improper cleaning as the internal pressures and flow rates are lowest for these areas.

Check for product residue, debris, rust stains or any type of off color films or deposits on the membrane surfaces. Membrane material is transparent. Therefore, the white of the backing material is the predominant color of a clean membrane element surface. Pay particular attention to the edges of the elements, and along the ridges of the various flow channels. Inspect the permeate discharge ports and spacer plates.

D. Parallel Leaf.

This style, when used for dairy application, has stacks of membrane elements that are assembled in brick shaped groups which are then inserted into a square, stainless steel module housing. Each of these membrane cartridges has a permeate discharge connection. Prior to the inspection, designate the membrane cartridges to be inspected. In order to be inspected, membrane cartridges preceding the designated membrane cartridge will have to be removed from the module housing. This is similar to the removing of unselected spiral wound membranes modules in order to reach the module that was selected for inspection.

Once removed, the membrane cartridge can be disassembled to inspect the individual membrane elements and surfaces. Carefully check each membrane as it is removed from the module for product residue, debris, rust stains or any type of off color films or deposits on the membrane surfaces. Pay particular attention to the edges of the elements, and along the ridges of the various flow channels. Inspect the permeate discharge ports and spacer plates.

E. Hollow Fiber.

These modules do not allow for detailed inspection of the membrane surfaces. The membrane surface is on the interior of the hollow fibers which are usually sealed within a permanently bonded, transparent plastic housing. The bore of an individual hollow fiber is too small for visual inspection. You can, however, hold the module in front of a strong light source to observe if the tubules are plugged.

Check the modules for proper workmanship of the potting resin securing the fibers in place at the ends of the housing. The surfaces shall be smooth and be free of pits, bubbles, folds or crevices. Also, examine the module to determine if there is a product film or other residue visible inside the module housing. Carefully review cleaning and module flux records to determine if any significant variations or drop in flux rates have been recorded. Concentrate inspection on any modules which indicate reduced flow rates.

F. Ceramic.

Monolithic ceramic membranes are extremely brittle and will shatter if subjected to sharp blows or other stresses. Care must be taken when handling and inspecting these elements. Generally these are designed similar to tubular membranes. The ceramic membrane may be a series of single tubes or a series of cast multi-tubes within a module housing. Gasketing or self-vulcanizing potting material can be removed in order to remove a membrane element for inspection.

Using a flashlight, carefully inspect the interior surfaces for product residue, debris, rust stains or any type of off color films or deposits on the membrane surfaces. Pay particular attention to the ends of the elements.

Note:

> The SFEC membrane is a black carbon matrix with a grayish, alumina oxide interior membrane surface. The light grey color is normal and not a residue film.

Inspect the permeate discharge ports, lines and the inside of the module housing after the membrane elements have been removed.

Item M19—Diafiltration Water (58.127a).

Diafiltration is the process during which water is introduced into the concentrated product stream to facilitate the removal of the remaining water soluble components such as residual lactose and minerals.

All water used for diafiltration shall be from the potable plant supply or from a supply of plant process water that has been treated and approved according to the USDA guidelines for process water (see the guidelines for Item A38—Water Supplies & Handling for the proper handling of process water). Untreated cow water or RO permeate is not acceptable for use as diafiltration water (category A deficiency).

Item M20—Permeate Piping (58.128a, l, o).

As the permeate passes through the membrane surface, it is collected within the modules. From the modules, it is generally transported through a variety of small diameter plastic tubes or pipes to a manifold system. The manifold system may also be of plastic or it may be of stainless steel. Do not criticize the use of plastic for permeate collection integral with the modules and their permeate manifolds. Subsequent piping, however, shall be stainless steel using “3-A” sanitary connections or sanitary welds. The small diameter tubes may be slip on fittings, or held in place with clamps or special fittings. Screw driver type clamps are unacceptable. Remove several of the fittings or slip on tubes and examine for product residue or other evidence of improper cleaning.

Follow the appropriate inspection guidance for Item A3—Pumps, Pipelines, & Valves for the larger diameter tubes, manifolds, valves, and pumps. If the fittings and tube sizes equal or exceed 1 inch in diameter, they shall comply with all applicable 3-A Sanitary Standards.

Flow meters shall comply with the *3-A Sanitary Standards for Flow Meters for Milk and Liquid Milk Products, Number 28-* .

Permeate lines are seldom found dirty. RO permeate is essentially water and UF permeate is essentially sugar water. Do not spend a lot of time inspecting these areas. Spot check several areas to confirm that the permeate system is clean.

Item M21—Storage Tanks (58.128d).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

Item M22—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Records

Item M25—Recording Charts (58.146a, 58.148).

Examine the recorder charts on file to see that they match the procedures for time and temperatures of the various cleaning cycle steps. If charts are not available, this item is unsatisfactory, recommend that charts be provided and retained on file for a period of three months.

If no provision is made for recording the cleaning cycle recommend the INELIGIBLE status.

Also check the recording charts for product storage tanks, and the processing system where specific temperatures are required. Make recommendations as appropriate.

Item M26—Processing Log (58.148).

The plant shall maintain a daily processing log which details the daily operation. The log shall include at least the following items:

1. The date and hours of operation.

2. Operating pressures.

3. Stream temperatures.

4. Feed, retentate, concentrate and permeate flow rates.

5. Element replacement.

6. Unusual occurrences.

7. Operator's signature or initials.

Review the processing logs to see if they are properly maintained and complete. Be particularly alert to notations of unusual occurrences. Question plant management or the operators about the nature of the occurrence and the follow-up response made by the plant.

If no records are maintained, recommend they be implemented immediately and recommend the assignment of the APPROVED-3 MONTHS status (category B deficiency).

Item M27—Flux Test Reports (58.148).

Flux tests are an important method to monitor the sanitary condition of the membrane modules. Flux is the rate of extraction of permeate measured in liters per square meter of membrane

surface per hour. As membrane surfaces age or become fouled the flux rates decrease. This test is used to evaluate the effectiveness of the cleaning regimen.

Check that the plant is running daily flux rate tests or some other test to evaluate the membrane modules within the system. If wide variations in daily flux rates are observed, recommend that the cleaning system be reviewed and evaluated. A sight decrease in flux rates over time is normal as the membranes age and should not be criticized. Dramatic changes indicate a problem that should be investigated and resolved.

If no records are maintained, recommend they be implemented immediately and recommend the assignment of the APPROVED-3 MONTHS status (category B deficiency).

Item M28—Membrane Module Log (58.148).

Most membrane modules in a spiral wound system bear a serial number. Other systems also identify individual membranes or membrane bundles or groupings. Check that the plant maintains a log of when the membranes were placed into service and their location in the system. This log is used when selecting membranes for inspection.

If no records are maintained, recommend that they be implemented immediately and recommend the assignment of the APPROVED-3 MONTHS status (category B deficiency).

Retentate and Permeate Handling

Item M31—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Item M32—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item M33—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item M34—Retentate Storage (58.128d, 58.810).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal and Item W8—Whey Heating or Cooling for special considerations for the handling of whey, whey products, and whey fractions.

Item M35 – Permeate Storage (58.128d, 58.810).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

If the permeate is to be used as animal feed or disposal, check that the handling and storage do not adversely impact on the cleanliness of the plant or surroundings. Make recommendations as appropriate.

Item M36—Permeate Use.

Have plant management declare the intended use of the permeate. Record the utilization on the report.

If it is intended for further processing as a human food and inspection is requested, complete the appropriate plant survey pages. If it is shipped to another facility for processing as human food, record the destination plant on the report.

If it is intended for animal feed or disposal, record the specific uses.

The RO permeate is essentially water and shall be handled and inspected under the same procedures as for evaporator cow water. See the guidelines for Item A38—Water Supplies & Handling.

Item M37—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

General Items

See the guidelines for Page A – General Items.

Page N. Inspection of Natural Cheese Cutting and Shredding Operations. (Form DA - 151 - 11)

Storage & Tempering of Bulk Cheese

Item N1—Room Construction (58.126, 58.412).

See the guidelines for Item B50—Room Construction - Tempering.

Item N2—Lighting & Ventilation (58.126d, e, 58.412).

See the guidelines for Item B54—Lighting & Ventilation.

Item N3—Storage Temperature (58.126d, e, 58.412).

See the guidelines for Item B55—Temperature Control.

Bulk cheese coolers should be maintained at a temperature of 45° F or lower (do not criticize higher temperatures in tempering rooms). If the cooler is at a higher temperature recommend the temperature be kept below 45° F, also show the current temperature on the survey report.

Item N4—Pallets & Floor Racks (58.126e).

See the guidelines for Item K4—Pallets & Floor Racks.

Item N5—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item K5—Housekeeping.

Cheese Dumping & Stripping

Item N7—Room Construction (58.126, 58.413).

See the guidelines for Item A1—Room Construction.

When consumer-sized packages of cheese are cut and wrapped or shredded, separate rooms shall be provided for the dumping and stripping of the bulk cheese and for the cutting and wrapping operation. Separate rooms are required because of the unsanitary nature of dumping the cheese. Also, recommend that the cardboard boxes and the plastic liners be removed by separate employees (see guidelines for Item K17—Cheese Dumping).

Item N8—Lighting & Ventilation (58.126d, e, 58.413,).

See the guidelines for Item A2—Lighting & Ventilation.

Light protectors and at least 50 F/C of light is required where the cheese is cleaned (careful examination of the cheese surfaces is required). 30 F/C of light is required in other areas.

The dumping and stripping (and the cutting and packaging) room shall be provided with filtered air. Air movement shall be outward from the packaging room toward the dumping room to minimize the entrance of unfiltered air into the cutting and packaging room. This requirement of the *General Specifications* can be satisfied with one air filtering system in the cutting and packaging room if there is sufficient air movement through the rooms. It is not necessary to check the efficiency of the filters, only that the air is filtered.

Item N9—Tables & Conveyors (58.128a).

See the guidelines for Item K18—Tables & Conveyors.

If the plant is dumping barrels of trim for use in a shredding operation, inspect the table, hoist, lance, conveyor, etc. for cleanup and condition (see the guidelines for Item K17—Cheese Dumping). Whenever possible, to be present during production to ensure the dumping is done in a sanitary manner.

Item N10—Hand Washing Facilities (58.127c).

See the guidelines for Item B21—Hand Washing Facilities.

Item N11—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese Cutting & Shredding

Item N15—Room Construction (58.126, 58.151, 58.413).

See the guidelines for Item N7—Room Construction.

A separate room is required for the cutting and packaging operation. If other production activities occur in the cutting and packaging room, check that there is no chance of contaminating the exposed product or product contact surfaces.

Item N16—Lighting & Ventilation (58.126d, e, 58.413, 58.444).

See the guidelines for Item N8—Lighting & Ventilation.

The air entering the cutting and packaging room shall be filtered.

Item N17—Tables & Conveyors (58.128a).

See the guidelines for Item K18—Tables & Conveyors.

Item N18—Equipment for Cutting (58.128a).

See the guidelines for Item K21—Grinder Feeding Equipment.

Check the cutter and any precutters for cleanup and condition. Plastic push plates shall be as smooth as a No. 4 finish with no exposed threads, cracks, or crevices. Also, check for the proper radii in wire grooves to assist cleaning. When plates with damage are observed (cuts, gouges, nicks, etc.) recommend replacement. Plastic push plates with bolted construction should be dismantled for inspection, make appropriate recommendations.

Item N19—Equipment for Shredding (58.128a).

If the plant does not have any shredding equipment or does not request the code for shredding, grating, crumbling, or dicing of cheese show this item as NA. Otherwise, use this item to make recommendations covering all the equipment used in these operations.

Check the *Accepted Equipment List.* If the shredding equipment is not listed, follow the guidelines for Item A3—Pumps, Pipelines, & Valves.

Use caution when inspecting shredders or dicers, special woven metal gloves are usually worn to protect against injury when handling the knives. Shredders require extensive disassembly for manual cleaning (no accepted models are suitable for mechanical cleaning). Carefully check the knives, feed chute, outlet, and other product contact surfaces for cleanup and condition and make appropriate recommendations. Also, check the underside of the frame and

shrouds. Nonproduct contact surfaces should be clean and in good repair and should not contribute to any unsanitary conditions within the plant.

Item N20—Equipment Sanitizing (58.444).

All product contact surfaces shall be subjected to an effective sanitizing treatment prior to use. Equipment which has been used and then sits idle for 2 hours or more should be rewashed and sanitized prior to being reused.

Item N21—Conveyor to Packaging (58.128a).

See the guidelines for Item K18—Tables & Conveyors.

Item N22—Disposition of Scrap (58.124b, 58.127f, 58.413).

See the guidelines for Item A34—Sanitary Practices.

Cheese Packaging

Item N24—Wrapping Machine and Item N25—Shredded Cheese Packaging (58.128a).

Check the *Accepted Equipment List.* If the packaging machine model is not listed, follow the guidelines for Item A3—Pumps, Pipelines, & Valves.

Packaging machines for shredded cheese shall comply with the *3-A Sanitary Standards for Equipment for Packaging Dry Milk and Dry Milk Products, Number 27- .*

Inspect the product contact surfaces for cleanup and condition and make appropriate recommendations. Nonproduct contact surfaces should be clean and in good repair and should not contribute to any unsanitary conditions within the plant.

Some block-type packaging machines for small consumer cuts (such as Hayssen and Cryovac) utilize index chains for the in-feed. These chains should be removed from the machine and cleaned in a COP tank or with a high pressure washer. Carefully check the many crevices for cleanup and condition but do not criticize the use of roller link chains if they are clean.

If the plant is using a shrink tunnel, the exhaust should be vented outside the plant. Check the cleanup and condition of these ducts. The ducts should be designed to be easily cleanable and inspectable. The discharge end shall have a screen or self-closing louvers. If possible, check the discharge area for unsanitary conditions such as product residues and foul odors.

Item N26—Miscellaneous Equipment & Utensils (58.128).

See the guidelines for Item K36—Misc. Equipment & Utensils.

Include any ingredient feeders under this item. The FDA standards of identity allow the use of anticaking agents (sometimes called flow agents) on shredded cheese. These agents are usually sprinkled over the top of the shredded cheese as it travels to the packaging machine. Because these compounds are not dairy ingredients, the interior of the ingredient feeder does not need to meet product contact surface requirements. However, it shall have a cover and any parts that extend into or over the product zone shall meet product contact surface requirements. Also, check the area for dust control, the flow agents shall be dumped in a sanitary manner, the outer ply of the bags shall be striped, or if laminated bags are used they shall be vacuumed or brushed clean, before being dumped. The ingredient feeder should be wet washed each time the shredding equipment is washed. However, do not criticize the practice of dry cleaning provided the product contact surfaces are clean and they are stored in an area that is dry while the other equipment is being washed.

If an antimycotic (mold inhibitor) is used see the guidelines for Item C54.

Item N27—Scales and Coders (58.128m).

Record any deficiencies concerning construction, maintenance, and cleanup if the scale platform is a product contact surface. Otherwise, check that the scale does not contribute to any unsanitary conditions in the production area. It is not necessary to check the accuracy during plant surveys.

Item N28—Handling of Trim (58.124).

See the guidelines for Item A34—Sanitary Practices.

In order for cheese trim generated by a USDA approved cheese cutting operation to be used in the manufacture of other approved cheese products (regardless of whether the trim is used within the plant or shipped to another USDA approved plant), the cutting operation must meet the same requirements as one listed in Section I of the *Approved Plant Book* with the "Natural Cheese Trim" code. The cheese trim shall be properly classified, handled and stored. The term "cheese trim" shall apply only to good condition, clean cheese which is collected, packaged and stored in a sanitary manner. It is to be free of defects such as dirt, mold, and soft spots, and be suitable for human consumption. The most common sources of cheese trim are from natural cheese cutting and packaging operations.

The following guidelines apply to both Section I plants that request the "Natural Cheese Trim" code and all other plants that save cheese trim which is intended for use in the production of pasteurized process cheese or other products.

A. Collection Equipment.

Collection equipment shall be constructed of stainless steel, plastic materials which meet 3-A and FDA requirements, steel barrels with plastic liners, or other suitable containers accepted by the Dairy Grading Branch. The catch bins may be built so they can slide into the framework or hang off the side of the conveyor or table. They shall not be placed on the floor unless they have legs. Alternately, they shall have sides a minimum of 6 inches high to protect the trim from contamination. If the collection pans do not adequately protect the trim from contamination, it shall be considered scrap and not for human consumption.

When cheese trim is saved for further processing, inspect the catch pans, collection barrels, pails, etc., for any deficiencies of construction, maintenance, or sanitation. Check carefully for hard-to-clean areas, milkstone, cheese remnants, broken seams, and exposed threads. All the areas above the collection pans shall meet product contact surface requirements or be provided with adequate shields.

B. Packaging.

Cheese trim shall be packaged in a sanitary manner which minimizes the opportunity for mold growth. To minimize the air in the container and reduce the opportunity for mold to develop, the cheese shall be pressed into the container and the liner folded to completely cover the surface. Containers which are partially filled at the end of the days operation may be finished the following day. This product shall be placed in the cooler and be adequately protected during overnight storage.

In the instances where cheese trim is utilized in the same operation pressing is not required. However, the cheese trim shall be collected and stored in containers meeting the criteria under paragraph A above. In addition, the cheese trim shall be effectively covered to adequately protect the cheese from contamination and surface drying and should be properly labeled (see the guidelines for Item N29—Disposition of Trim Paragraph C. Labeling). Check the trim containers for condition of the trim and make a recommendation for prompt processing if there is mold development on the cheese.

C. Storage.

See the guidelines for Items B51—Room Construction - Coolers, B54—Lighting & Ventilation, B55—Temperature Control (except that the temperature shall not exceed 45° F), and B56—Housekeeping. Storage times for cheese trim shall be kept to a minimum. Check trim container labels for production dates (the cutting date). If any production dates are older than 20 days, make a recommendation for prompt handling and processing of cheese trim.

Item N29—Disposition of Trim (58.124).

In addition to compliance with the requirements of Item N28 for the handling of natural cheese trim, Section I plants that request the "Natural Cheese Trim" code shall meet the following criteria.

A. Approved Supply Plant.

For a cheese cutting operation to obtain approval for Cheese Trim, all cheese packaged at the operation shall originate from USDA approved dairy plants.

B. Returned Cheese.

Since the handling and storage conditions of cheese which has entered distribution channels cannot be evaluated, returned cheese is not eligible for inclusion with cheese trim in an operation approved for natural cheese trim. Because there is no way to monitor the trim for presence of returned cheese, the INELIGIBLE status shall apply to any cheese cutting operations (listed in Section I with the cheese trim code) which receive returned cheese.

C. Labeling.

The cheese cutting operation shall securely attach a tag which contains the following information to the cheese trim barrel or container.

1. "Natural Cheese Trim from Cheese Manufactured in USDA Approved Dairy Plants."

2. Plant Number of Cheese Trim Operation (for example "55-425").

3. Production Date(s) of Cheese Trim (for example "12/11/98" or "12-11-98")

4. Plant number of Cheese Manufacturing Operation(s) – Date of Cheese Manufacture – and types of Natural Cheese in Container.

5. Signature and Date by a Responsible Plant Official.

Example:

Mixed Cheese Trim

Natural Cheese Trim
From Cheese Manufactured in USDA Approved Dairy Plants
Plant #55-123

55-341	06/11/97	Cheddar
55-108	06/12/97	Colby
27-156	05/27-28/97	Edam

/s/ *Responsible Official* *06/18/97*

Item N30—Trim Press Room.

A press for edible trim shall be located in a processing room or area. If the plant presses scrap cheese into barrels a separate room or area and separate equipment should be provided for this purpose.

Item N31—Storage of Film.

Packaging film shall be protected from contamination at all times (taped box or poly bags). Do not criticize the practice of leaving enough packaging film for one day's production near the

point of use. However, during a cleanup the packaging film should be removed from the production area.

Item N32—Hand Washing Facilities (58.127c).

See the guidelines for Item B21—Hand Washing Facilities.

A hand wash sink shall be provided. Separate sinks in the dumping room and in the packaging room should be provided. However, one hand washing facility may suffice if it is convenient to both rooms, provided that foot traffic from the dumping and stripping room into the cutting and packaging room is limited.

Item N33—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese knives, scrapers, etc. should be stored neatly and in a sanitary manner when not in use. Paper, plastic, cardboard, and other waste shall be picked up and removed regularly and the floor should be relatively clean and free of cheese scrapings during production.

Casing Area

Item N35—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Item N36—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item N37—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Product Storage

Item N39—Room Construction - Coolers (58.126, 58.154, 58.412).

See the guidelines for Item B51—Room Construction - Coolers.

Item N40—Lighting & Ventilation (58.126d, e, 58.412).

See the guidelines for Item B54—Lighting & Ventilation.

Item N41—Temperature Control (58.126d, 58.412).

See the guidelines for Item B55—Temperature Control.

Item N42—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item B56—Housekeeping.

General Items

See the guidelines for Page A — General Items.

Page W. Inspection of Whey Collection and Processing. (Form DA - 151 - 12)

Use this page if the plant requests status for any whey products, including whey cream. All equipment used in collecting, storing, and separating the whey, starting at the cheese vats, should be included in the survey.

If the whey is to be membrane processed, use this Page for the whey collection and storage, then use Page M to cover the subsequent processing. When whey is condensed and dried at the same plant using an evaporator, inspect whey collection and handling using this page, then use Page D to inspect the subsequent processing operations. The code for "Whey" is optional but Pages W and D are required to assign the code for "Concentrated Whey" or "Dry Whey" (Page M is required also if the whey is preconcentrated using a RO system).

Collection, Handling, and Processing of Sweet Whey

Pay particular attention to the collection of whey from the various steps in the cheese making procedure. Whey drippings from nonproduct contact surfaces shall not be collected for further processing as human food.

Item W1—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Use this item to recommend correction of any deficiencies regarding construction, maintenance, etc., in the room where whey intended for human food is collected or stored. Preferably whey processing operations should be in a separate room or building from the cheese making operation, but this is not mandatory.

The unseparated whey tanks shall be in an area equivalent to a processing area. Pay particular attention to the condition and cleanliness of the floors.

Item W2—Lighting & Ventilation (58.126d, e, 58.443).

See the guidelines for Item A2—Lighting & Ventilation.

Item W3—Pumps, Pipelines, & Valves (58.128, 58.146a, 58.443).

See the guidelines for Item A3—Pumps, Pipelines, & Valves. The same requirements apply as for pumps, pipelines, and valves used for milk handling.

Item W4—Fines Saver(s) (58.428).

See the guidelines for Item C30—Fines Return & Fines Saver.

Use this item for deficiencies in whey collection. Use Item C30 to report deficiencies in the fines collection and return.

When a separator is used as the fines saver check the Accepted Equipment List to verify that the "desludging" section is acceptable for product contact. For Inspection guidance see the guidelines for Item B4—Separator.

Item W5—Collection of Sweet Whey (58.128, 58.443).

The whey must emanate from cheese handled in equipment designed to be sanitary not only for the cheese contact surfaces, but also for the whey contact surfaces. All equipment shall meet 3-A Sanitary Standards criteria. Equipment for which there are no 3-A Sanitary Standards will be inspected according to requirements outlined in the *USDA Equipment Guidelines*.

If the whey from any area is not intended for human food, it is recommended that the whey drain directly to the floor. However, if collection pans, troughs, or piping are employed, there shall be no cross connections with the whey collected for human food. Completely segregated systems shall be provided. If there is any potential for cross connection between the two systems recommend the INELIGIBLE status (category A deficiency).

Item W6—Miscellaneous Equipment.

In some cases, deficiencies in the cheese making equipment will also affect the whey codes. If this occurs, use this item to identify the equipment, the deficiencies, and the category classifications that need to be added to the whey code totals.

Sometimes the sweet whey is pumped from the cheese vats or tables directly to the unseparated whey tank or fines saver. Therefore, some deficiencies in the vats may affect the whey codes (cracked or unclean drain grates, etc.) and should be referenced here also.

Item W7—Unseparated Whey Tank(s) (58.128d).

See the guidelines for Items A28—Storage Tanks - Silo or A29—Storage Tanks - Horizontal.

The holding tank for unseparated whey shall be made of stainless steel or other equally corrosion-resistant metal and constructed for easy cleaning. Inspect the tank for condition and

cleanliness. Half-moon-type tanks used at some small factories are satisfactory. However, enclosed type conventional tanks should be encouraged whenever plant layout or expansion is planned.

The common industry practice of continuous in–out processing from a single unseparated whey storage tank is acceptable, provided that the amount in the tank is kept as low as possible (see the guidelines for Item W8—Whey Heating or Cooling).

When whey handling operations extend over long periods of time and might otherwise result in significant bacterial increases in the unseparated whey, the use of two tanks should be considered, or the whey should be heated or cooled. When two tanks are provided, they shall be cleaned and sanitized after approximately 4 hours of use. When the whey is either heated or cooled the storage tank shall be provided with an indicating thermometer and a recording thermometer (see the guidelines for Item W8—Whey Heating or Cooling).

Item W8—Whey Heating or Cooling (58.810).

If the whey is to be separated, this should be done as soon as practical after drawing to minimize the storage time at critical temperatures in the unseparated whey tank. When processing or separating cannot be carried out promptly, the whey must be either heated or cooled until processing commences. The General Specifications require that "Unless processed within 2 hours, all whey or condensed whey, except acid type whey with a titratable acidity of .40% or above, or a pH of 4.6 or below, shall be cooled to 45° F or lower, or heated to 145° F or higher." (§58.810a).

Questions have arisen about the "within 2 hours" requirement as it applies to plant survey work. This wording was not intended to preclude the common industry practice of continuous in–out processing from a single unseparated whey storage tank. A surge or supply tank is often used ahead of the whey separator to compensate between the rapid drawing of whey when the desired acidity is reached and the comparatively slower fixed rate of the separator.

In other words, if the plant survey reveals in–out sweet whey storage that is kept at minimum levels so as to promote processing as rapidly as practical, the practice is satisfactory. It is impossible to present guidelines regarding the amount of whey to be considered satisfactory for in–out storage; it would depend on equipment processing rates and individual plant circumstances. Whey retention time in such tanks can also be minimized by the manner of setting up the inlet and outlet piping. With a long horizontal tank, for instance, it would be best to pipe the whey in at one end and to remove it from the other end (in–out piping at the same end would tend to cause relatively static fluid flow conditions in the other end).

The use of two tanks should be considered for whey handling operations that extend over long periods of time and that might otherwise result in significant bacterial increases in the unseparated whey. See the guidelines for Item W7—Unseparated Whey Tank(s).

The last sentence of §58.810a permits other whey temperatures for essential technological reasons, such as lactose crystallization and membrane processes, provided that the quality and

wholesomeness of the product is not impaired. Accordingly, do not criticize temperature variations employed to induce lactose crystallization in condensed whey for either drying or lactose production. Similarly, different temperatures may be utilized for membrane processing (ultrafiltration, reverse osmosis, electrodialysis, gel fractionation, ion exchange, etc.), provided that the combination of temperature and processing residence time do not impair product quality or wholesomeness. Consult with the National Field Director about questionable whey handling practices with respect to temperature.

§58.810b also requires that "Recording thermometers shall be required and so located to assure that cooling or heating requirements in §58.810a are met."

Temperature recorders are not required for those special technological processes that are exempted from the heating or cooling requirements. Secondly, they are not required for the whey that is promptly processed within 2 hours (including in–out tanks).

For the whey that is subject to the heating or cooling requirement, check that a recording thermometer is provided, and properly located, to monitor that the requirements are met. In addition, an indicating thermometer is required to check the accuracy of the recording thermometer.

When the whey is held at 145° F or higher, location of the recorder sensor may vary depending on the particular processing setup. They might be located in the storage tank, in the pipeline to the storage tank, after the heater, etc. Use your judgment in determining satisfactory placement of the sensors. Temperature recorders are also needed when the plant cools and stores the whey at 45° F or lower prior to processing. As with hot whey, the sensor locations shall assure that the cooling requirement is met. When recorders are absent or not properly located, make a recommendation for providing them and assign the deficiency to category B.

So-called "acid whey" from cottage cheese, cream cheese, etc., which has pH of 4.6 or below or titratable acidity of .40% or above will exhibit a natural inhibitory effect toward bacterial propagation. It is not necessary that acid whey be cooled to 45° F or heated to 145° F if there is delay before processing into human food. Such whey may be handled at drawing temperature, approximately 110–120° F without criticism.

For manufacture of modified whey products, artificial souring of sweet whey to a pH 4.6 or less by the addition of a suitable food grade acid, when used together with a suitable heat treatment of the whey to destroy lactic and staph bacteria, is a satisfactory practice. Acids such as vinegar (acetic acid), citric acid, lactic acid, malic acid, phosphoric acid, etc. can be used to approximate acid whey conditions and thus avoid the need for cooling to 45° F or heating to 145° F. Storage and shipment of such artificially acidified sweet whey at 135° F is satisfactory. The acidification should be performed as soon as practical after separation of the milkfat from the whey. This method of handling sweet whey may be useful where denaturation of whey proteins caused by excessive heating might be deleterious to the product or to subsequent processing operations, such as reverse osmosis or ultra-filtration.

Item W9—Clarifier or Separator (58.128e).

See guidelines for Item B4—Separator.

With the advent of whey fines savers and self-cleaning separators, there is less need for the centrifugal clarifiers. When present, inspect them in the same manner as outlined for separators. Also check that bowl sludge is disposed of in a way that does not create a nuisance.

When the plant has requested a code for whey cream and no other whey products, show NA for the rest of the Items in this section except for Items W15—Animal Feed Handling, W16—Load–out Facilities, and Item W17—Housekeeping.

Item W10—Separated Whey Tank(s) (58.128d).

See the guidelines for Items A28—Storage Tanks - Silo or A29—Storage Tanks - Horizontal.

When tanks are used for storage of separated “sweet” whey for more than 2 hours prior to processing, product shall be:

1. cooled to 45° F or lower or heated to 145° F or above, or

2. two separated whey tanks can be alternated every 4 hours as outlined in Item W7—Unseparated Whey Tank(s), when two tanks are provided, they shall be cleaned and sanitized after approximately 4 hours of use, or

3. when two unseparated whey tanks are alternated every 4 hours as outlined in Item W7—Unseparated Whey Tank(s), a small balance tank that has an average residence time of 4 minutes or less can be used.

Check that an indicating thermometer and a recording thermometer are provided to verify the proper storage of the whey if either of the heating or cooling options is practiced. When recorders are absent or not properly located, make a recommendation for providing them and assign the deficiency to category B.

These storage requirements do not apply to “acid whey” from cottage or similar type cheeses. The low pH of such whey, approximately 4.6, effectively restricts bacterial growth.

Item W11—HTST Sealed _____ at _____ sec. _____ ° F (58.128, 58.809).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec. _____ ° F.

Show NA for this item if the whey is shipped raw or heat-treated, or if the pasteurization step is at the evaporator or a membrane system.

If whey is received from other plants it shall be pasteurized at the receiving plant unless the solids content is 40% or greater.

Item W12—Heat-Treating or HTST Equipment (58.128, 58.809).

See the guidelines for Item C6—Heat-Treating or HTST Equipment.

Item W13—Heat-Treating at _____ sec. _____ ° F (58.128, 58.809).

See the guidelines for Item C7—Heat-Treating at _____ sec. _____ ° F.

Item W14—Utilization of Sweet Whey (58.808).

Show the human food utilization of the whey on the report (dry whey, lactose, dry whey-NDM blends, etc.). If shipped from the plant, show the name and address of the plant(s) that receives the whey.

Whey for processing must be fresh and originate from milk meeting §58.132 through §58.138 of the General Specifications. This requirement in satisfied if the whey originates from a cheese plant that is USDA approved for cheese and whey (approval of these operations involves review of plant milk quality and USDA analysis of milk samples for DMCC). The requirement is also satisfied if the whey originates from a Grade A cheese plant in which the entire milk supply is Grade A, and the whey handling after removal from the vat is inspected and approved by the Grade A authority. In this case the manifest or bill of lading must state that the product is Grade A and the plant must be on the IMS list with the product code(s) for whey. In such instances, determination of satisfactory Grade A inspection coverage on the whey will be made by the National Field Director through contact with the Grade A authority having jurisdiction over the cheese operation. If satisfactory arrangements cannot be made for Grade A inspection of the whey handling operations, USDA survey and approval is required.

The General Specifications §58.808 wording allows ingredients approved by the FDA to be added to whey during processing. Some ingredients the plant may be using include: neutralizers, phosphate compounds, peroxides for bleaching purposes (see paragraph B below), and defoamers (see paragraph C below). It is not our intent here to list all the FDA permitted additives. It is the plant management's responsibility to ascertain the legal status about any intended additives, to use required food grades of such materials, to use them in accordance with any applicable FDA limitations or guidance, and to ensure the labeling of the final product meets applicable FDA requirements.

Notwithstanding this responsibility on the part of plant management, if you should observe additive uses that appear to conflict with these guidelines, discuss the matter with the plant manager and then bring the details to the attention of the National Field Director for guidance.

A. Neutralizing of whey.

The acidity of whey may be adjusted by the addition of safe and suitable pH adjusting ingredients. When sodium hexametaphosphate is encountered during a plant survey it should not be marked as unsatisfactory or influence the plant status assignment provided its use is within the following parameters.

1. It is used at a level of less than 1.0%.

2. Its use level is at the absolute minimum level necessary to accomplish the purpose for which it is intended.

3. If there is any functional or technological reason for the sodium hexametaphosphate in the food (i.e., bakery goods, ice cream) in which the whey is used it must be declared on the label as an ingredient.

It will be necessary for the survey inspector to ask sufficient questions to determine that the above parameters are being followed.

B. Bleaching of whey.

Although hydrogen peroxide and benzoyl peroxide may be used to bleach whey, the FDA does not permit the use of these chemicals as preservatives. The intended purpose can usually be distinguished by the manner of use. Whey bleaching for the production of white color, dry whey is commonly carried out by adding the peroxide to preheated whey in a storage tank (where the plant alternates between two tanks) or to the hot well prior to condensing. Its bleaching effect is greatly reduced at lower temperatures, therefore, improper use as a preservative should be suspected if the peroxide is added under any of the following circumstances:

1. Prior to the separator or at any point upstream of the preheating stage to the evaporator.

2. Prior to holding the whey for extended periods (more than 2 hours) at temperatures between 45° F and 145° F.

Examples:

> Whey is processed in an RO system then stored in a silo overnight prior to condensing in an evaporator. Peroxide is added just prior to the silo and the temperature of the whey in the silo is 125° F. In this example the peroxide is being used as a preservative.
>
> If, in the above example, the peroxide was added prior to the silo but the temperature in the silo was lower than 45° F or higher than 145° F, the use of peroxide is acceptable. In this example the temperature in the silo is the means of quality control.

Call the National Field Director if you need guidance regarding proper bleaching practices. Collect relevant details first, such as the name of the chemical, the amount added, where it is added in the process, product temperature, and method of peroxide dissipation (whether by addition of a catalase enzyme, release during subsequent drying process, etc.). Since hydrogen peroxide and benzoyl peroxide shall not be used for preservative purposes, the details of their use are important to determine proper use for bleaching purposes only.

C. Defoamers.

The use of defoamers is allowed in whey. The defoamer should be added to the whey after the separator. For more information on defoamers see the guidelines for Item C33.

Item W15—Sweet Whey Storage Tank(s) (58.128d).

See the guidelines for Items A28—Storage Tanks - Silo or A29—Storage Tanks - Horizontal and Item W10—Separated Whey Tank(s).

Use this item to record deficiencies in any whey tanks, after the pasteurizer or heat treatment, used to store the whey for load–out or further processing.

Item W16—Animal Feed Handling (58.443a).

See the guidelines for Item D43—Waste Products Handling.

Show NA when the whey is intended for human food.

Item W17—Load–out Facilities (58.131).

See the guidelines for Item B31—Load–out Facilities.

Item W18—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Collection, Handling, and Processing of Salty Whey

In most plants, much of the same facilities and equipment are used for both sweet whey and salty whey. In this case, put "Same as W {item number}" next to the items in this section and put a "✓" or an "✘" in the appropriate column, it is not necessary to repeat the recommendations. When salty whey is not collected for human food use, mark this section NA.

Item W20—Room Construction (58.126).

See the guidelines for Item W1—Room Construction.

Item W21—Lighting & Ventilation (58.126d, e, 58.443).

See the guidelines for Item A2—Lighting & Ventilation.

Item W22—Pumps, Pipelines, & Valves (58.126, 58.146a, 58.443).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Also, if probes are used, use this item to record any deficiencies noted in the vacuum-whey pipelines .

Item W23—Collection of Salty Whey During Hooping (58.128, 58.443).

Since salty whey is quite corrosive, it is cautioned that type 316 stainless steel would be more suitable for constructing tanks and equipment instead of the more commonly employed type 304. Equipment that is pitted is unsatisfactory, recommend polishing the rough surfaces. When definite or pronounced pitted conditions are observed recommend that the equipment be repaired or replaced. Continued use of definite or pronounced pitted equipment that is not clean will result in a reduction or loss of approved plant status.

Equipment operated on a batch or vat basis shall be cleaned or thoroughly rinsed between vats. Make recommendations as appropriate. For equipment operated on a continuous basis, inspect the salty whey collection pans and pipes for accumulations of a product residue. Pay particular attention to the wet/dry interface areas where residues may not be removed by the normal flushing action of the whey. When accumulations are noted recommend that the areas be rinsed periodically (at least once every 2 hours of operation) with potable water or approved process water. Recirculated whey, permeate, and cow water are not acceptable rinsing media.

Include the salty whey collected during the first application of salt under this item. The following equipment, commonly used at this stage of cheese making, is satisfactory provided it is clean, in good condition, and has received USDA acceptance of design and construction: Enclosed mellowing conveyors; Cheesemaker III; Open or closed drain tables; Open cheese vats.

A. Manual filling of Hoops.

Manual filling of hoops with curd pails or shovels is now used only at small factories. Nevertheless, the manual system of curd hooping is satisfactory if the whey collection procedures are conducted in a sanitary manner. These hooping operations are usually conducted with the hoops located on the bottom of the make vat or drain table. The salty whey runs across the bottom of the vat or drain table to a collection container at the vat outlet. The collection method must be sanitary and assure no intermingling with the sweet whey.

B. Stainless Steel 40 lb. Block Hoops.

The hoop construction shall be designed on both the interior and the exterior for product contact. Check for cracks, crevices, bolted areas, etc. which do not meet product contact surface criteria. Make recommendations as appropriate.

C. Perforated Hard Plastic 40 lb. Block Hoops or Moulds.

Plastic moulds shall be made of suitable plastic material and be reviewed and accepted by the Dairy Grading Branch. In addition, effective hoop washing equipment shall be provided. If the plastic mould has a supportive stainless steel frame, the frame must have sanitary construction as it is considered as a salty whey contact surface.

Check the Accepted Equipment list. If the hoops are not listed, follow the guidelines in Item A3—Pumps, pipelines, & Valves.

D. Miscellaneous Hoops (daisies, longhorns, etc.).

Stainless steel construction is recommended. However, well-tinned iron hoops utilizing proper fabrication (no spot welds, rough welds, cracks, crevices, etc.) are acceptable. Plastic construction is also satisfactory if effective washing equipment is provided, and the design has been reviewed and accepted by the Dairy Grading Branch. Pay additional attention to the exterior surfaces that come into contact with the salty whey (see the guidelines for Item C46—Hoops, Forms, & Press Cloths).

E. Barrels.

Barrel lines usually incorporate a pneumatic conveying system. Guidelines for inspecting the lines, filters, cyclone, barrel extensions, etc. are on Page C. Deficiencies in these areas should not be repeated here.

Barrels may be stainless steel, painted iron that is paraffin coated and lined with a single service polyethylene liner, or fiberboard (solid or corrugated) lined with a single service polyethylene liner. Check that the salty whey is protected from contamination from the exterior of the barrel, supports, monorail system, etc.

Note:

> The perforated draining cover must also be of sanitary construction. Threads are allowed on the draining cover clamps provided they are taken apart and cleaned effectively after each days use.

The greatest quantity of salty whey is withdrawn shortly after filling (hooping) operations using perforated probes and a vacuum whey handling system, which is similar to a milking machine. Such systems are acceptable provided inspection reveals sanitary construction and good sanitation. Disassemble and inspect the interior construction of the probe system. Pay special attention to attachment of flexible hoses to stainless steel stub ends. All stubs are to be removed for cleaning. Vacuum systems generally are not designed for mechanical cleaning yet are frequently circulated with cleaning solutions. When vacuum probe systems are not clean make appropriate recommendations. Deficiencies in sanitation or fabrication of the exterior of the probes should be listed under Item C48—Probes and should not be repeated here.

Subsequently, the barrels are pressed or tipped slightly downward and more salty whey drains out into open catch trays or into individual containers. Generally, protecting the salty whey collected in these containers is very difficult. When this salty whey is to be used for human food, the collection equipment must be well sloped for drainage and protected against contamination from the environment (air cylinders, exterior of the barrels, monorail system, etc.). This may require special shields or methods of attachment of the polyethylene liner to the collection system. These areas will be assessed at the time of the initial inspection. The collection equipment must be stainless steel; tinned metal or plastic construction is not acceptable.

F. 640 Containers.

Guidelines for inspecting the lines, filters, cyclone, barrel extensions, etc. of a pneumatic conveying system are on Page C. Deficiencies in these areas should not be repeated here.

The vacuum probing and draining methods are approximately the same as for cheese in barrels, and the same inspection criteria will apply, in addition to the following guidelines.

1. Stainless Steel Construction.

Welded construction is satisfactory if the welds are continuous and polished to a number 4 finish.

Knockdown type construction is satisfactory if reviewed and accepted by Dairy Grading Branch. Check the *Accepted Equipment List*. If the hoops are not listed, follow the guidelines in Item A3—Pumps, Pipelines, & Valves.

2. Hard Plastic Construction.

Plastic construction is satisfactory if effective washing equipment is provided, and the design has been reviewed and accepted by the Dairy Grading Branch. Pay additional attention to the exterior surfaces that come into contact with the salty whey

Note:

> There are at least two Arena designs. The moulds date stamped after 2/92 are designed and accepted for the collection of salty whey. Boxes prior to that date are acceptable, provided the salty whey is not collected and utilized for human food.

3. Solid or Corrugated Fiberboard, Lined with Single Service Polyethylene Liner.

Satisfactory, provided the salty whey is protected from contamination from the exterior of the 640 forms or box, supports, carts, monorail system, etc. This may require special shields or methods of attachment of the polyethylene liner to the collection system.

4. Wooden Construction.

These containers are usually knockdown type made of paraffined plywood panels and using painted iron angle-shaped frame and corners, held together with tensioned and clamped steel or plastic bands. Salty whey withdrawn by vacuum probes may be separated or desalted for human food use. All salty whey recovered through subsequent pressing or draining operations shall be diverted to the floor or for uses other than human food unless the system is reviewed and accepted by the Dairy Grading Branch. Acceptance is based on the *Structural Standards and Sanitary Guidelines for Wood 640 Boxes (first or second edition)* and *Guidelines for Whey Collection from 640 Boxes (original edition).* Both Guidelines are available from the National Cheese Institute. The plant should have a letter from the Dairy Grading Branch if the system has been accepted. When the plant is collecting salty whey from wooden 640s after the probes, the following items shall be checked:

1. The 640 components shall be reconditioned after each use and inspected according to *Structural Standards and Sanitary Guidelines for Wood 640 Boxes* before using. The inspection shall include examination for cheese mites and condition of the boards. Boards with frayed or splintered edges, gouges, or peeled plywood sections shall not be used. Inspect the components on hand and review the plant's log sheets.

2. The box assembly area shall be an area suitable for handling product contact surfaces. When the box assembly area is in a warehouse the boxes shall be lined in a production area. The components shall be prevented from coming in contact with the floor by the use of mats, pads, plastic pallets, etc.

3. The made up boxes shall be stored in a sanitary manner. Unlined boxes can be stored for use the next day provided they are protected from contamination. Lined boxes should be used within one hour.

4. The box and liner can be sanitized. When a sanitizer is used, it should be applied at least 5 minutes before filling so it has time to drain out of the liner and off the box to keep it out of the salty whey.

5. The liner shall prevent whey or curds from contacting the wooden box.

6. The entire salty whey collection system shall be designed to meet product contact surface requirements. Unsanitary surfaces shall be provided with a shield to protect the salty whey from contamination.

7. Salty whey troughs, collection equipment, and piping shall be rinsed at least once every 2 hours of operation with potable water or approved process water. Recirculated whey, permeate, and cow water are not acceptable rinsing media. Between uses, box extensions (hoop extensions), press plates, drainer knife assemblies, and dollies shall be rinsed clean of whey and curds.

When the plant has an acceptance letter, all the above items should be checked each survey. If the plant's system has not been accepted, and a thorough review of the system confirms that all the above items are satisfactory, and the plant is complying with all GMP's, assign the deficiency to category C↑. Have the plant contact the National Field Director to arrange a review of the system or the status of the plant will be reduced after the next survey.

When the plant has a letter and any of the above items are unsatisfactory, assign the deficiency to category B, except where contamination of the product is noted in which case assign the deficiency to category A. If the plant does not have a letter and any of the above items are unsatisfactory, assign the deficiency to category A.

Item W24—Collection of Salty Whey During Pressing (58.128, 58.443).

The most commonly used pressing systems for American type cheeses are:

A. 40 lb. Block forming Towers (Wincanton, etc.).

The salty whey is extracted through a combination of a vacuum and the pressure from the cheese mass in the tower. It passes through perforated drain plates and collects in a balance tank fitted with two level probes to control a pump at the tank outlet. It is then pumped to a plant supplied salty whey storage tank.

When the blocks of cheese emerge from the block former, they are immediately bagged and sealed. There is no further collection of salty whey.

B. Conventional Open Horizontal or Vertical Cheese Presses.

The press collection pan, rails, and press head must be of sanitary stainless steel construction and the press environment and overhead areas shall be satisfactory, so that nearby operations or overhead conditions do not allow contamination of the salty whey.

Collection containers for salty whey from open presses (both vertical and horizontal) shall be of sanitary design with stainless steel or other approved construction materials. Tinned metal or plastic containers are not acceptable.

Collection containers shall be stored on sanitary racks when not in use or following cleaning. The containers shall be emptied frequently, at least hourly. When this is not possible, as with overnight cheese pressing at small factories the whey shall be discarded. If the plant is collecting such salty whey recommend the INELIGIBLE plant status (category A deficiency). When troughs are used rather than pans, they shall be rinsed at least every 2 hours.

Whey draining operations should be placed so that employees do not have to step over open pans or troughs. If this is noted, recommend relocation or provision of covers and assign the deficiency to category B, except where contamination of the product is noted in which case assign the deficiency to category A.

Large drain pans, as often used with monorail draining systems, should be pitched slightly for self-drainage to the pump.

C. Enclosed Tunnel Presses and Vacuum Chambers.

With some of these systems, special moulds are used to press the cheese inside an enclosed tunnel using pressure from air cylinders or from air filled rubber bladders. The salty whey runs to one end of the press and is piped to a storage tank.

The filled moulds are mechanically conveyed to the pressing tunnels and some salty whey drips from the moulds. When this whey is recovered for human food use, the moulds, conveyors, catch pans, and piping system must be of USDA accepted sanitary design and construction and maintained in a sanitary condition. Thoroughly inspect all surfaces of the pressing tunnel.

When inspecting a conventional vacuum chamber follow the guidelines for B. Conventional Open Horizontal or Vertical Cheese Presses, above.

D. Miscellaneous Draining and Pressing Systems.

These will be individually inspected and evaluated. Follow appropriate inspection guidance for product contact surfaces and for the protection of the collected salty whey from contamination by the environment. All components are to be maintained in a sanitary condition. If questions arise concerning the inspection criteria, contact the National Field Office for guidance.

Item W25—Miscellaneous Equipment.

In some cases, deficiencies in the cheese making equipment will also affect the whey codes. If this occurs, use this item to identify the equipment, the deficiencies, and the category classification that need to be added to the whey code totals.

Item W26—Salty Whey Tank(s) (58.128d).

See the guidelines for Item A29—Storage Tanks - Horizontal.

The use of farm bulk tanks is an acceptable alternative, provided the tank meets the *3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-* or the *3-A Sanitary Standards for Farm Milk Storage Tanks, Number 30-* .

Item W27—Salty Whey Heating or Cooling (58.443).

Unless processed within 2 hours, the salty whey shall be heated to a minimum of 125° F or cooled to 45° F or lower and be stored at that temperature until it is separated, and subsequently held until membrane processing is started.

The 125° F storage and processing temperature was researched by Dr. S. R. Tatini of the University of Minnesota as being suitable from a bacteriological control standpoint. This recommendation is satisfactory to USDA.

The maximum age of salty whey before membrane processing shall be 60 hours, calculated from the time the first salty whey in the batch is produced until start-up of membrane processing of the batch. Check plant production records of collection and storage. Make recommendations as appropriate.

The heating may be accomplished by an in-line heater or by mixing with hot salty whey maintained at 125° F minimum in the storage tank(s). If direct steam injection heating is used, check that the steam is produced according to *3-A Accepted Practices for a Method of Producing Steam of Culinary Quality, Number 609-* . Also, check the steam injectors for sanitation and compliance with *3-A Sanitary Standards for Steam Injection Heaters for Milk and Milk Products, Number* 61-.

If there is heat loss during pumping, fines removal and centrifugal separation, the salty whey shall be immediately reheated so the contents of the batch tank and balance tank (if provided) of the membrane processing system is maintained at 125° F or higher.

Check for provision of automatic means of temperature control and recording thermometers on tanks for storage of salty whey prior to separation. Accurate indicating thermometers shall also be provided to allow correct adjustment of the recording thermometers. Sensors of the indicating and recording thermometers shall be located close to each other. If the controls and thermometers are not present, functioning, or properly located mark the report “unsatisfactory”

and recommend the INELIGIBLE status (category A deficiency). However, temperature recorders are not required for the whey that is processed within 2 hours (including in–out tanks) and is therefore also exempt from the heating or cooling requirements.

Item W28—Separator (58.128e).

See guidelines for Item B4—Separator.

When a plant has only one whey separator show “Same as W9” next to this item and put a mark in the appropriate column, it is not necessary to repeat the recommendations. The Salty whey shall be processed after the sweet whey, or the system shall be cleaned prior to running sweet whey.

Item W29—Salty Whey Utilization (58.128d, 58.810).

See the guidelines for Item W14—Utilization of Whey.

When the plant has requested a code for whey cream and no other whey products, show NA for this Item.

Item W30—Salty Whey Storage Tank(s) (58.128d).

See the guidelines for Items A28—Storage Tanks - Silo or A29—Storage Tanks - Horizontal.

Use this item to record deficiencies in any salty whey tanks used to store the whey for load–out or further processing.

Item W31—Animal Feed Handling

See the guidelines for Item W16—Animal Feed Handling.

Item W32—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Handling and Processing of Whey Cream

Item W34—Room Construction (58.126).

See the guidelines for Item A1—Room Construction.

Item W35—Lighting & Ventilation (58.126d, e, 58.443).

See the guidelines for Item A2—Lighting & Ventilation.

Item W36—Pumps, Pipelines, & Valves (58.128, 58.146a, 58.443).

See the guidelines for Item A3—Pumps, Pipelines, & Valves.

Item W37—Separator (58.128e).

See guidelines for Item B4—Separator.

Show “Same as W9 (or W28)" next to this item and list the category of the deficiency in the unsatisfactory column. It is not necessary to repeat the recommendations.

Item W38—HTST Sealed _____ at _____ sec. _____ ° F (58.128, 58.809).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec. _____ ° F.

Show NA for this item if the whey cream is shipped raw or heat-treated.

Whey cream can also be used to standardize the cheese milk in the plant where it was produced. The whey cream shall be pasteurized prior to the vats, either in separate equipment at a minimum of 166° F for not less than 15 seconds, or by addition to the balance tank of the HTST with the cheese milk.

Alternately, if the whey cream is added directly to the vat, the cheese shall be labeled as “raw milk cheese” or “cheese for manufacturing” (see the guidelines for Item C54 for labeling requirements).

Item W39—Heat-Treating or HTST Equipment (58.128, 58.809).

See the guidelines for Item C6—Heat-Treating or HTST Equipment.

Item W40—Heat-Treating at _____ sec. _____ ° F (58.128, 58.809).

See the guidelines for Item C7—Heat-Treating at _____ sec. _____ ° F.

Item W41—Whey Cream Tank(s) (58.128d, 58.443c).

See the guidelines for Item A29—Storage Tanks - Horizontal.

The use of farm bulk tanks is an acceptable alternative, provided the tank meets the *3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-* or the *3-A Sanitary Standards for Farm Milk Storage Tanks, Number 30-* .

Whey cream is a human food product and shall be handled accordingly, employing clean, properly constructed and maintained equipment. If shipped from the plant it may or may not be pasteurized or heat treated. When the cream is shipped from the plant and the plant mixes or blends whey cream with other cream in any proportions, the USDA status assigned shall be for whey cream. If used in the manufacture of butter it shall be pasteurized at the plant where churned.

The handling, cooling, and storage of whey cream in stainless steel, or well tinned, clean milk cans is a satisfactory practice. Check all the empty whey cream cans available using the inspection guidelines for Item A5—Condition of Producer Cans. When more than 10 percent are in an unsatisfactory condition, show a recommendation for correction and a summary of the inspection results.

Example:

W41. — Reduce off-condition whey cream cans below 10 percent (5 of 15 examined were rusty/dirty - 33 percent) (B).

Check that the whey cream in cans is cooled immediately after separation. Placing filled cans of whey cream in the cheese cooler without prior cooling is an unsatisfactory practice because of the very slow cooling that takes place. If such conditions are encountered, recommend that the plant cool the cream prior to filling the cans or cool the cans with a recirculating type spray cooler (this would only be practical at small cheese plants, with limited amounts of whey cream).

When separating directly into a cooler or pasteurizing vat, check that the cooling is continuous and the temperature maintained at 45° F or lower. Also check the cooler for sanitation, and for proper construction, covers, flush type valves, proper agitator seals, etc.

If the whey cream is shipped to another plant for butter making it shall be picked up frequently. Make applicable recommendation if cream is not shipped at least every 4 days.

If a plant that ships both sweet cream and whey cream desires to be approved for both products, check carefully to see that the plant keeps both products completely segregated. If a single processing system such as separator/clarifier, heat-treating system, HTST system, or vat pasteurizer is to be used for both products during a production run, the whey cream shall be processed last, unless all components in the common system(s) have been subjected to a complete CIP cleaning cycle or have been manually cleaned. Likewise, if common load–out

facilities are used for whey cream and cream, the whey cream shall be loaded out last unless all piping, pumps, valves, and associated fittings have been subjected to a full CIP cleaning cycle or manually cleaned. Whey cream and cream shall be stored in separate, clearly identified tanks.

Some plants standardize the milk for cheese making by the addition of whey cream. Do not criticize the practice when the whey cream is properly handled prior to addition, that is, it is added promptly after separation or is cooled and stored satisfactorily until it is used.

Item W42—Load–out Facilities (58.131).

See the guidelines for Item B31—Load–out Facilities.

If the same facilities are used for both the whey and the whey cream, it is not necessary to repeat the recommendation. Write “Same as W17” next to this item and list the category of the deficiency in the unsatisfactory column.

Item W43—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

General Items

See the guidelines for Page A — General Items.

Page Z. Determination of Plant Status. (Form DA - 151 - 13)

Show All Required Information in the Heading.

A. DMCC Log Averages.

Fill in the last three DMCC averages, if known.

B. Plant Status History.

List the status and date of the three previous plant surveys. If this information is not available from the previous report or the National Field Office, leave one or more of the boxes blank. Showing the products or operations which were approved is not necessary if the current survey covers the same products and operations.

C. Laboratory Results.

If salmonella surveillance samples or alternate fats are sampled in conjunction with the survey, fill in the DMS number(s) and leave the rest of this section blank. The National Field Office will report the lab results.

D. Status Recommendation Worksheet.

Use this section to list the codes that cover the processes and equipment included in the survey. Obtain the sum of the deficiencies in each category for each code and list the total on the worksheet under the appropriate deficiency column. Status for each code shall be determined individually (see Exhibit Z1).

1. List All the Codes on the Status Recommendation Worksheet.

Similar codes can be listed on the same line. For example, the code for American cheese and skim milk cheese for manufacture might be listed on the same line, if the equipment is the same, because the deficiencies in the cheese room will affect both codes.

Plants with multiple systems, requiring multiple Pages (see Section II. B), will have the same code listed more than once. In these instances, the systems shall be clearly identified (see Exhibit Z4).

Do not list codes that were not included in the current survey (if performing a partial survey), unless the cursory survey reveals conditions that cause a change in status.

2. Determine the Number of Deficiencies for Each Code.

After you have decided which Pages are required, obtain a total for each category on those Pages. List this total in the appropriate column. Status for each code is determined independently. For example in a cheese plant, the deficiencies in the cheese room are included in the cheese codes, but not the whey codes or the whey cream code.

E. Reference Table.

To the right of the Status Recommendation Worksheet is a box showing the highest status that should be recommended based on the total deficiencies in each category (see Exhibit Z2). Note that some areas are blank. This is because status has been determined by deficiencies in other categories.

The reference box should serve as a general guide when assigning status. This table lists the highest status that can be assigned considering the number of deficiencies noted in each category. The numbers in the parenthesis should be used when assigning status to the raw milk and cream codes (except whey cream, which requires Page W). This table is used with each code the plant requests (except as noted in Item D.1 above).

F. Deciding on a Status Recommendation.

Show your recommendation for status based on your judgement of survey observations and the allowable number of deficiencies in the Reference Table. Directly after the applicable status in the Status of Plant - This Survey table, list the codes for the products or processes for which the plant is being approved (see Exhibit Z3). If a code is to be added or deleted from the plant record, provide a special notation in the remarks section. Do not show a status for uninspected operations in a multi-product plant (i.e., after a partial survey, only list the codes included in the current survey on page Z).

Remember, the objective of this system is to have the Inspector document the deficiencies that led to the status recommendation. If the numbers in the Reference Table indicate that a higher status should be assigned than conditions within the plant seem to warrant, contact the National Field Office.

When the PROBATIONARY 10-DAYS status is assigned, or the APPROVED 3-MONTHS status is assigned on consecutive surveys, provide a short explanation in the remarks section.

1. Status for the Raw Receiving Area and Sweet Cream Codes.

The number of deficiencies in the parenthesis (in the Reference Table on Page Z) is used to determine the maximum status for the M1 and M2 codes. Therefore, a FULL STATUS milk receiving plant must have 4 or less category D deficiencies. A completed Page A is required at all plants that receive and process raw milk whether the plant requests status for raw milk or not. Page B, Page C, or Page D, can be used to assign the cream code.

2. Status for Other Codes.

The processes, facilities, and equipment of plants producing the same products will sometimes differ greatly, therefore, the Inspector will need to use good judgment when making the status recommendation.

Follow the guidance presented in the Reference Table. Generally, these numbers will be used to decide the status to assign, but the plant's response to previous survey recommendations should also be taken into account. For example, if a plant has made few or no improvements, a status lower than indicated in the table can be assigned. In some instances it is appropriate to assign a lower status to a code because of deficiencies in other departments. If only the milk and cream codes in a multi-product plant qualify for the APPROVED 6-MONTHS or FULL Status, these codes should be assigned the same status as the other codes.

3. Special Considerations for Plants With Multiple Systems.

When surveying plants with multiple systems that require multiple Pages (see Section II. B) the first step is to list the total deficiencies for each system separately on the Status Recommendation Worksheet (see Exhibit Z4). Next, determine the status for each system as outlined above. Then, list the lowest status for that code on the appropriate line in the Status of Plant - This Survey Table (see Exhibit Z5).

Exhibits

Exhibit Z1

Status Recommendation Worksheet from Page Z. In this example, the worksheet has been filled out with codes and the total number of deficiencies for each code.

STATUS RECOMMENDATION WORKSHEET					
CODES THIS SURVEY	TOTAL FOR EACH CATEGORY				
	A	B	C	D	E
M1			*1*	*0*	*3*
M2				*4*	*1*
C3, C6, C45			*6*	*10*	*2*
M3		*1*	*0*	*2*	*1*
W15, W20			*6*	*15*	*0*
W16, W21			*7*	*12*	*2*
W3			*8*	*14*	*1*

Exhibit Z2

Reference Table from Page Z.

REFERENCE TABLE					
HIGHEST STATUS RECOMMENDATION	TOTAL DEFICIENCIES IN EACH CATEGORY				
	A	B	C	D	E
FULL STATUS				8(4)	
APPROVED 6-MONTHS	ALL OTHER PLANTS				
APPROVED 3-MONTHS		1			
			7(3)		
			3	15	
INELIGIBLE	1				
		2(1)			
			8(4)		
			5	20	
( ) INDICATES NUMBER OF DEFICIENCIES ALLOWED FOR CODES FOR RAW RECEIVING FACILITIES AND SWEET CREAM					

Exhibit Z3

Status of Plant from Page Z. In this example, the codes have been assigned status based on the deficiencies in Exhibit Z1.

STATUS OF PLANT - THIS SURVEY *(Indicate Codes)*	
FULL STATUS	
APPROVED 6-MONTHS	C3, C6, C45, M1, M2
APPROVED 3-MONTHS	M3, W15, W16, W20, W21
PROBATIONARY 10-DAYS	
INELIGIBLE	W3
NO STATUS ASSIGNED	

REMARKS:

DA-151-13 (08-97)

In this example the M1, M2, C3, C6, and C45 codes receive the APPROVED 6-MONTHS status because there are no category A or B deficiencies and less than the number of category C deficiencies that requires status to be lowered to APPROVED 3-MONTHS.

The M3 code receives the APPROVED 3-MONTHS status because of one category B deficiency.

The W15 and W20 codes receive the APPROVED 3-MONTHS status because of an excessive number of category C and D deficiencies (3 or more C's and 15 or more D's required the APPROVED 3-MONTHS status to be assigned).

The W16 and W21 codes receive the APPROVED 3-MONTHS status because of an excessive number of category C deficiencies (less than 7 are required to assign the APPROVED 6-MONTHS status).

The W3 code is made INELIGIBLE because of 8 category C deficiencies.

Exhibit Z4

Status Recommendation worksheet from Page Z. In this example, the worksheet has been filled out with the total number of deficiencies for two process cheese lines.

STATUS RECOMMENDATION WORKSHEET					
CODES THIS SURVEY	TOTAL FOR EACH CATEGORY				
	A	B	C	D	E
P 9 Loaf		*1*	*2*	*4*	
P 9 Slice			*3*	*2*	

Exhibit Z5

Status of Plant from Page Z. In this example, status has been assigned based on the deficiencies in Exhibit Z4.

STATUS OF PLANT - THIS SURVEY *(Indicate Codes)*	
FULL STATUS	
APPROVED 6-MONTHS	
APPROVED 3-MONTHS	*P9*
PROBATIONARY 10-DAYS	
INELIGIBLE	
NO STATUS ASSIGNED	

REMARKS:

DA-151-13 (08-97)

The P9 code is assigned the lower APPROVED 3-MONTHS status because of the one category B deficiency noted on the loaf line (see Exhibit Z4).

Appendix A

The following table is provided to assist with status assignments for all codes except M1 and M2.

Status Assignment	Category				
	A	B	C	D	E
Full				8 or Less	
Approved 6-Months	All Other Plants				
Approved 3-Months		1			
			7	Less than 20	
			3-6	15 or greater	
Ineligible	1				
		2			
			8	Any number	
			5-7	20 or greater	

The following table may help with status assignments for the M1 and M2 codes.

Status Assignment	Category				
	A	B	C	D	E
Full				4 or Less	
Approved 6-Months	All Other Plants				
Approved 3-Months			3	Any Number	
Ineligible	1				
		1*			
			4	Any number	

* Except as noted in Item A5—Condition of Producer Cans, which permits the assignment of the Approved 3-Months status with one category B deficiency.

Index