

codex alimentarius commission



FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD
HEALTH
ORGANIZATION



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CX 5/35

CL 2008/18-FFP
July 2007

TO: Codex Contact Points
Interested International Organizations

FROM: Secretary, Codex Alimentarius Commission
Joint FAO/WHO Food Standards Programme
Viale delle Terme di Caracalla, 00153 Rome, Italy

SUBJECT: **Request for Comments at Step 6 on the Draft Code of Practice for Fish and Fishery Products (Lobsters and relevant Definitions)**

DEADLINE: **31 January 2009**

COMMENTS:

To:	Copy to:
Secretary	Codex Contact Point
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BACKGROUND

1. The 29th Session of the Committee on Fish and Fishery Products agreed to advance the Draft Code of Practice for Fish and Fishery Products (Live and Raw Bivalve Molluscs and Lobsters and relevant definitions) to Step 8 for adoption by the 31st Session of the Commission¹.
2. At the 31st Session of the Commission, several delegations expressed the view that Section 13.1.2 Hygiene Control Programme did not reflect current scientific evidence and proposed that either the original text which allowed for in-factory chlorination while also indicating that such systems should follow the Draft FAO/WHO *Guide on the Use of Chlorination in Fish Processing* be reinserted or that Section 13 Lobsters be returned to the Committee on Fish and Fishery Products for further discussion.
3. In view of the discussion, the 31st Session of the Commission agreed to return the **Section 13 Lobsters and its relevant definitions** to Step 6 for comments and consideration by the 30th Session of the Committee on Fish and Fishery Products.²

Request for comments

4. Member Governments and interested International Organizations are invited to provide comments at Step 6 on the Draft Code of Practice for Fish and Fishery Products (**Lobsters and relevant Definitions**), in particular Section 13.1.2 and related provisions, and should do so in writing in conformity with the Uniform Procedure for the Elaboration of Codex Standards and Related Texts (see *Procedural Manual of the Codex*

¹ ALINORM 08/31/18, para. 62 and Appendix II

² ALINORM 08/31/REP, paras 31-35

Alimentarius Commission, Seventeenth Edition), preferably by an email to the addresses above by **31 January 2009**.

DRAFT CODE OF PRACTICE FOR FISH AND FISHERY PRODUCTS**(At Step 6 of the Procedure)****2.9 LOBSTERS**

Autolysis	is the breakdown or deterioration of lobster meat or viscera by means of indigenous enzymes
Black spot	is the appearance of dark pigments at the joints and injured parts of lobster segments, caused by oxidative enzyme reaction;
Butt end of the tail	is that part of the tail muscle of lobsters which extends into the cephalothorax;
Cephalothorax	is the body region of lobsters which is formed anatomically by the fusion of head and thorax;
Claw	means the pincer appendage at the end of the lobster arm;
Cooking	means boiling of lobsters in potable water, clean sea water or brine or heating in steam for a period of time sufficient for the thermal centre to reach a temperature adequate to coagulate the protein;
Deterioration	means those natural processes of quality reduction that occur after harvesting and that are quite independent of man's deliberate intervention;
De-vein	is to remove the intestine/vein from the lobster tail;
Enzymatic activity	is the catalytic action of enzymes on biochemical reactions;
Insensible	is the state of unresponsiveness as a result of thermal, electrical, or physical process imposed on lobsters prior to cooking;
Intestine/Vein	is used in this code to mean the posterior portion of the lobster alimentary tract;
Lobster	means commercially important species in the order Decapoda, and families Nephropidae, Palinuridae or Scyllaridae or other important economic taxonomic families;
Pasteurisation	means subjecting lobster meat to heat at times and temperatures, which inactivates spoilage and pathogenic micro-organisms without noticeable changes in appearance, texture and flavour of the product;
Pounding	refers to the holding of live lobsters in water tanks or floating crates for extended periods of time;
Shell	is the hard outer covering of lobsters;
Shucking	is the process of removing the meat from the shell and appendages of the lobsters;
Tail	is the abdomen or posterior part of the body;
Tailing	is the process of separating the tail from the cephalothorax;
Trimming	is the process of removing any signs of blood, membrane or remnants of the gut which may be attached to the shell or meat of lobsters;
Waste	means those lobster parts which remain after the meat removal operation is completed.

SECTION 13 - PROCESSING OF LOBSTERS

In the context of recognising controls at individual processing steps, this section provides examples of potential hazards and defects and describes technological guidelines, which can be used to develop control measures and corrective action. At a particular step only the hazards and defects, which are likely to be introduced or controlled at that step, are listed. It should be recognised that in preparing a HACCP and/or DAP plan it is essential to consult Section 5 which provides guidance for the application of the principles of HACCP and DAP analysis. However, within the scope of this Code of Practice it is not possible to give details of critical limits, monitoring, record keeping and verification for each of the steps since these are specific to particular hazards and defects.

This section applies to lobsters in the genus *Homarus*, and to rock lobsters, spiny lobsters, and slipper lobsters in the genera *Palinurida*, and *Scyllaridea*, and to squat lobsters in the genera *Cervimundia* and *Pleuronocodes*, and the Norwegian lobster, *Nephrops norvegicus*.

13.1 GENERAL – ADDITION TO PRE-REQUISITE PROGRAMME

In addition to the pre-requisite programme outlined in Section 3 of this document, the processing facility operators are encouraged to evaluate the design and construction of their facility and the maintenance and sanitation of their operation, specific to the processing of lobsters. Consideration should be given to the following:

13.1.1 Design and Construction of Equipment and Utensils

- in batch systems the inactivation tank, cooker and cooling tank should be located adjacent to each other and may be provided with an overhead hoist or gantry provided to transfer baskets from one to the other;
- cookers should be designed to provide constant and adequate supply of heat so that all lobsters could be given the same time/temperature exposure during the cooking operation;
- a chamber of adequate length, through which an open link conveyor passes and which is equipped with spray nozzles so that the lobsters are sprayed from all sides, may be used for the purpose.

13.1.2 Hygiene Control Programme

- When an establishment has its own supply of fresh water or seawater or other water sources, and chlorine is used for water treatment, the residual content of chlorine should not exceed that of potable water.
- water, which has been in contact with lobsters, should not be re-used unless reconditioned to avoid taint problems;
- it is undesirable for the same workers to handle the raw as well as the cooked product. If this is unavoidable, stringent precautions should be taken to prevent cross contamination of the cooked product by micro-organisms from raw material;

13.2 General Considerations for the Handling of Lobsters

Refer to Section 4 – General Considerations for the Handling of Fresh Fish and Shellfish.

13.2.1. Potential Hazards and Defects Associated with Lobsters

Refer also to Section 4.1 Potential Hazards Associated with Fresh Fish and Shellfish and Section 5.3.3.1 Identification of Hazards and Defects

13.2.1.1 Potential Hazards

Bacteria

Staphylococcus aureus is an aerobic or facultatively anaerobic gram positive spherical micro-organism. It is coagulase-positive and ferments glucose. Some strains can produce enterotoxins.

Staphylococcus is not found in the normal microflora on fish. The natural habitat for this organism is the skin and mucous membranes of animal and man. The presence of *Staphylococcus* on fish is an indication of post-harvest contamination due to poor personal hygiene. The organism is a poor competitor and will not multiply in fish. However, in fish or shellfish products, where the normal flora is reduced or eliminated (i.e. cooked peeled shrimp or crab meat), the presence of staphylococci indicates a potential for food poisoning.

Listeria monocytogenes is widely dispersed in the environment and foods. The organism is not exceedingly heat resistant and is killed by proper cooking. *L. monocytogenes* can grow in the presence or absence of oxygen and can survive in salt concentrations up to 10% NaCl. It can also endure frozen storage. An important factor in foodborne listeriosis is that the pathogen can grow to significant numbers at refrigeration temperatures when given sufficient time.

Despite the fact that a wide variety of foods may be contaminated with *L. monocytogenes*, outbreaks and sporadic cases of listeriosis are predominately associated with ready to eat (RTE) foods. Although the data is limited, surveys suggest that RTE seafood such as cooked lobster, cooked crab and smoked fish have been found to contain this bacterium.

Chemical Hazards

Veterinary Drugs

Medicated feeds or drugs may be used to control the spread of aquatic animal diseases where lobsters and/or crabs are maintained and fed in holding pounds. Residues of veterinary drugs in excess of recommended guidelines should be considered as a potential hazard.

Biotoxins

PSP toxins (saxitoxins) have been identified in the hepato-pancreas of lobsters.

13.2.1.2 Potential Defects

Black discoloration. Black discoloration is caused by melanin formation most commonly in the ventral tail segment joints and muscle surrounding the pericardium. It develops in the integumentary tissues and muscle surfaces, but does not occur in the muscle meat tissue. The use of sulfating agents to prevent this discoloration is a common practice and may result in unacceptable residues. The potential for residues of sulfating agents leads to labelling requirements because these chemicals are common allergens.

13.2.2 Minimise the Deterioration of Lobsters - Handling

Refer also to Section 4.3 – Minimise the Deterioration of Fish – Handling

- it is generally known that under similar conditions, the quality of lobsters deteriorate more rapidly than fish and therefore care in maintaining the lobsters live prior to processing is strongly recommended;
- since lobster legs and other appendages can be easily broken and the damage can cause the risk of infection and weakening of the lobster, care should be taken to handle live lobsters at all times;
- tanks and wells for pounding live lobsters should be so placed and constructed as to ensure survival of the lobsters;
- live lobsters should be carefully packed in clean tanks, wells, crates, open-weave bag, or in boxes covered with wet sacking and held at as low a temperature as practicable, as required of varying species;
- holding tanks are regarded as a better method of storage for long-term handling than well storage;
- the use of clean Hessian or jute bags, for transport, is preferred. Bags made of woven synthetic material should not be used;
- where bags open weave are used for transport, precautions should be taken to avoid suffocation of lobsters due to slime or mud;
- care also should be taken to maintain the necessary humidity in holding the lobsters live in bags for transport;
- species, which mutilate each other, should have the claws banded as soon as possible after catching;
- if it is not possible to keep lobsters alive until the time of processing, lobsters should be killed. Tails should be carefully separated and cleaned before freezing or cooling down to the temperature of melting ice, which should be done as rapidly as possible.

13.3 Processing Operations – Lobsters

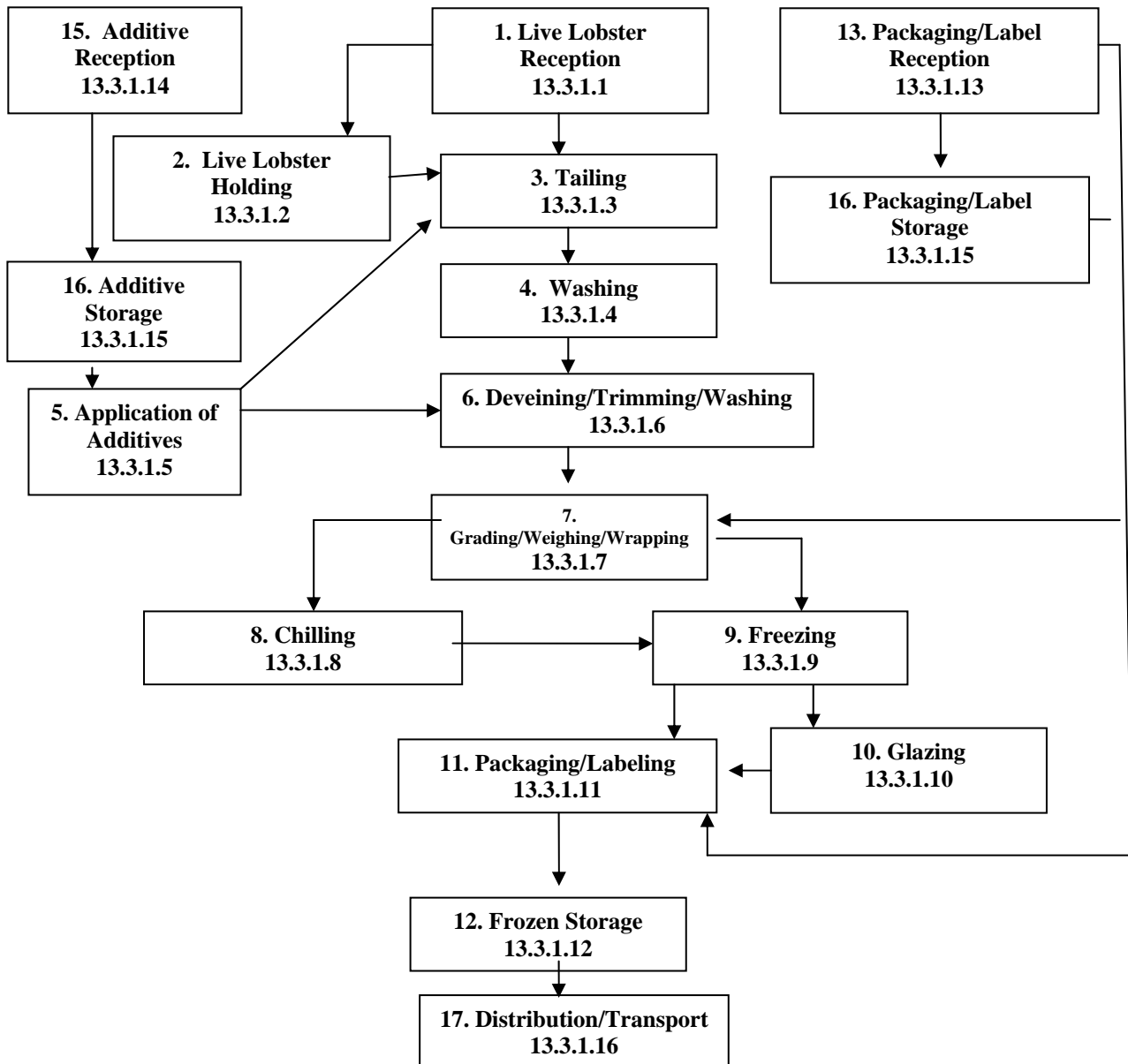
Once a processing facility has established a pre-requisite programme (Section 3) the principles of HACCP (Section 5) can be applied to each individual process within that facility.

This section provides two examples of products derived from lobsters. Special consideration was given to elaborate on products which involve heat treatment because of their potential impact on food safety (such as post processing handling). The products and their respective flow diagrams are as follows: Frozen Raw Lobster Tails (Fig. 13.1), Chilled Cooked Whole Lobster/Chilled Cooked Lobster Meat (Fig. 13.2). To provide an appreciation for other products of lobsters, a reference has been included in Appendix A and B.

This flow chart is for illustrative purposes only. For in-factory HACCP implementation a complete and comprehensive flow chart has to be drawn up for each process

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Figure 13.1 Example of flow chart for frozen raw lobster processing



13.3.1 Frozen Raw Lobster Tail

13.3.1.1 Live Lobster Reception (Processing Step 1)

Potential Hazards:

Potential Defects: Reception of weak or injured lobsters, lobster decomposition

Technical Guidance:

- live lobsters should be inspected upon receipt to ensure that they are alive, which can be demonstrated by active leg movement and the tail of lobsters being curled lightly underneath the body when the lobster is picked up. Dead lobsters have a high probability of decomposition due to a high autolysis rate and should not be processed
- weak lobsters should be processed immediately;

- since lobster legs and other appendages can be easily broken and the damage can cause to risk of infection and weakening of the lobsters, care in handling should be applied to live lobsters at all times. The necessary skills should be acquired by lobster handlers;
- lobsters should be rejected if they are known to contain harmful or extraneous substances and/or defects which will not be eliminated or reduced to an acceptable level by normal procedures of sorting or preparation. An appropriate assessment should be carried out to determine the reason(s) for loss of control and the HACCP or DAP plan should be modified where necessary.

13.3.1.2 Live Lobster Holding (Processing Step 2)

Refer also to Section 13.2.2 – Minimise the Deterioration of lobsters – Handling, of this document. Refer also to “Section 6.1.2 – Growing Water Quality” and Section 6.3.2 Veterinary Drugs.

Potential Hazards: *Veterinary Drug Residues*

Potential Defects: *Lobster decomposition*

Technical Guidance:

- all live lobsters should be processed as soon as possible;
- storage time should be monitored where appropriate and should be as short as practical;
- to minimise damage, black discoloration (melanosis) and mortality losses during captivity, especially for the moulting stage of lobsters, over-crowding should be avoided and this can be achieved by controlling the stocking density;
- for short-term storage, live lobsters should be held in suitable containers and in land-based tanks and wells that should be supplied with running sea water, or in dry crates;
- dead whole lobsters should not be processed and should be rejected and disposed in a proper manner. An appropriate assessment should be carried out to determine the reason(s) for loss of control and the DAP plan should be modified where necessary.
- If drugs are used, appropriate withdrawal times must be followed.

13.3.1.3 Tailing (Processing Step 3)

Potential Hazards: *Microbiological contamination*

Potential Defects: *Improper tailing, decomposition*

Technical Guidance:

- when lobsters are not landed alive, the tail and cephalothorax should be separated immediately after catching. This practice is strongly recommended as they are brought on board. Tails should be carefully separated and cleaned before freezing or cooling down to the temperature of melting ice, which should be done as rapidly as possible;
- tailing should be carried out as rapidly as possible;

13.3.1.4 Washing (Processing Step 4)

Refer also to section 8.1.5 – Washing and Gutting.

Potential Hazards: *Unlikely*

Potential Defects: *Poor cleaning*

Technical Guidance:

- lobster tails should be washed in plenty of running potable water, or clean sea water, or water as outlined in 13.1.2, to remove all impurities;

13.3.1.5 Application of Additives to Lobster Tails (Processing Step 5)

Potential Hazards: *The use of non-approved additives; incorrect application of Sulphites³.*

³ List of additive names for “sulphites” and “phosphates” can be found in the Codex Standard for Quick Frozen Lobsters (Codex Stan. 95-1981.)

Potential Defects: *Physical contamination, black spots due to inadequate application of Sulphites⁷, incorrect application of Phosphates⁷.*

Technical Guidance:

- Mixing and application of appropriate additives should be carried out by trained operators;
- Regular checks of the additive levels should be carried out.
- Tails with black spots should be discarded.
- Non-approved additives should not be allowed in the processing facility.
- sulphites should be used in accordance with manufacturer's instructions and Good Manufacturing Practice.

13.3.1.6 De-veining/Trimming/Washing (Processing Step 6)

Refer to Section 8.1.5 – Washing and Gutting

Potential Hazards: *Microbiological contamination*

Potential Defects: *Incomplete de-veining, decomposition, dark membrane attached to the shell, physical contamination*

Technical Guidance:

- the intestine should be removed immediately and consideration should be given to use methods such as ejection by water pressure, vacuum, or physical removal by appropriate utensils (such as scissors, knives or extractors);
- skills should be acquired by lobster handlers with particular attention being given to the removal of membrane and blood from the front end of the tail where the meat is exposed;
- an adequate supply of clean water or potable water should be available for the washing of de-veined and trimmed lobster tails to ensure that no remnants of the gut or its contents remain;
- the de-veined or trimmed lobster tails should be washed and well iced or appropriately chilled in clean containers and stored in specially designated and appropriate areas within the processing facility;
- the de-veining process should be carried out quickly to prevent product spoilage. Tails waiting for de-veining should be kept on ice or refrigerated at 4°C or less.

13.3.1.7 Grading/Weighing /Wrapping (Processing Step 7)

Potential Hazards: *Microbiological contamination*

Potential Defects: *Incorrect net weight, inadequate wrapping, inappropriate packaging material, incorrect grading*

Technical Guidance:

- lobster tails should be graded into species, sizes and weights for the relevant market, to assure the economic integrity of the final product;
- calibrated balances should be provided for accurate grading;
- balances should be calibrated periodically with a standardized weight to ensure accuracy;
- packaging material should be clean, sound, durable, sufficient for its intended use and of food grade material;
- the wrapping and packaging operation should be conducted in a sanitary manner to avoid contamination of the product;
- care should be taken to ensure that the front end of tail where the meat is exposed is completely wrapped to protect against dehydration;
- weights of finished packages should be monitored at regular intervals to assure that they are the proper net weight.

13.3.1.8 Chilling (Processing Step 8)

Refer to sections 4.2 – Time and Temperature Control.

Potential Hazards: *Microbiological contamination*

Potential Defects: *Decomposition*

Technical Guidance:

- for lobster tails, chilling in refrigerated sea water is not recommended because excessive salt penetration into the muscle will take place rapidly. However, refrigerated clean water systems can be used for rapid pre-cooling before freezing or storage in ice;
- chilling should take place as rapidly as possible to prevent microbiological growth and deterioration.

13.3.1.9 Freezing (Processing Step 9)

Refer to section 8.3.1 – Freezing Process

Potential Hazards: *Unlikely*

Potential Defects: *Poor texture*

Technical Guidance:

- air blast, liquid nitrogen, or other freezing methods should be rapid to produce high quality tails and to ensure that the textural qualities of the product are retained;

13.3.1.10 Glazing (Processing Step 10)

Refer to Section 8.3.2 – Glazing

Potential Hazards: *Microbiological contamination*

Potential Defects: *Incomplete glaze, foreign matter*

Technical Guidance:

- glaze water should be replaced regularly to ensure that a high bacterial load does not occur and to prevent build-up of foreign material;
- chilling of glaze water will result in a more uniform application of glaze that will better protect the product;

13.3.1.11 Final Packaging/Labelling (Processing Step 11)

Refer to Section 8.2.3 – Labelling.

Potential Hazards: *Absence of labelling of allergenic additives*

Potential Defects: *Subsequent dehydration, incorrect labelling.*

Technical Guidance:

- packaging material should be clean, sound, durable, sufficient for its intended use and of food grade material;
- care should be taken to ensure that the front end of tail where the meat is exposed is completely wrapped to protect against dehydration.
- where sulphites were used in the process, care should be taken to ensure that this additive is properly declared on the label.

13.3.1.12 Frozen Storage (Processing Step 12)

Refer to Section 8.1.3 – Frozen Storage

Potential Hazards: *Unlikely*

Potential Defects: *Freezer burn, dehydration.*

Technical Guidance:

- products should be properly packaged to protect against freezer burn and dehydration;
- glaze is recommended as a further measure to ensure against dehydration;

13.3.1.13 Packaging and Label Reception (Processing Step 13)

Refer to section 8.5.1 – Reception – Packaging, Labels & Ingredients

Potential Hazards: *Unlikely*

Potential Defects: *Contaminated packaging, incorrect labels.*

Technical Guidance:

- packaging materials should be examined for signs of contamination;
- labels should be examined for accuracy and to adherence to applicable regulations;

13.3.1.14 Additives Reception (Processing Step 15)

Refer to section 8.5.1 – Reception – Packaging, Labels & Ingredients

Potential Hazards: *Biological, chemical and physical contamination*

Potential Defects: *Contamination, mislabelling*

Technical Guidance:

- Additive shipments should be examined to ensure that they are not contaminated and that the container integrity is sufficient;
- Additive shipments should be examined to ensure that they are the correct chemical and meet purchase specifications;

13.3.1.15 Additives, Packaging and Label Storage (Processing Steps 14 and 16)

Refer to Section 8.5.2 – Storage – Packaging, Labels & Ingredients.

Potential Hazards: *Unlikely*

Potential Defects: *Contaminated additives or packaging material.*

Technical Guidance:

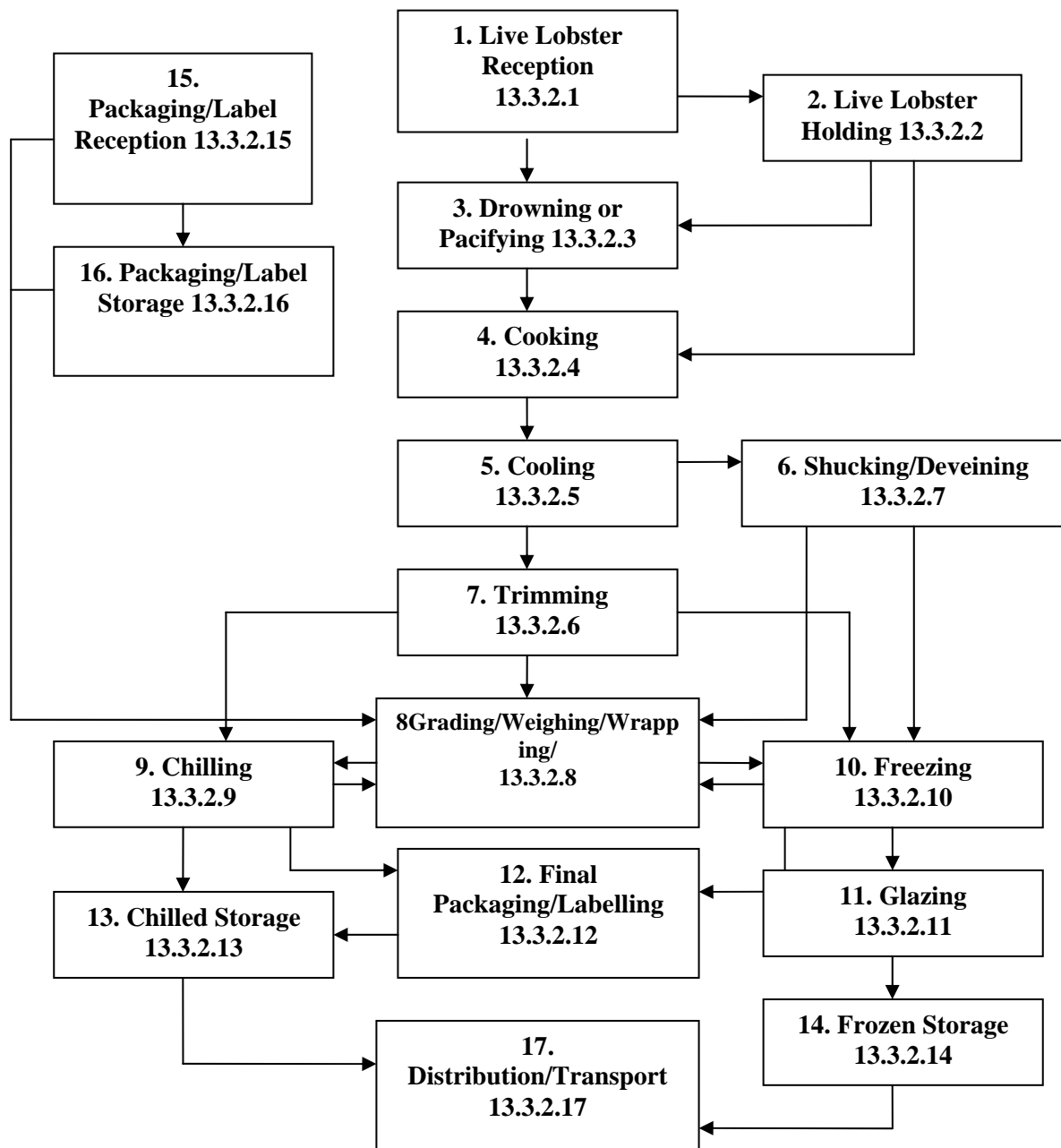
- food additives and packaging material should be protected from dust, dirt and other sources of contaminants;
- pests and insects should be excluded from the packaging storage area;

13.3.1.16 Distribution and Transport (Process Step 17)

Refer to Section 17 – Transport

This flow chart is for illustrative purposes only. For in-factory HACCP implementation a complete and comprehensive flow chart has to be drawn up for each process

Figure 13.2 Example of Flow Chart for Processing of Cooked Lobsters



13.3.2 Chilled and Frozen Cooked Whole Lobster and Cooked Lobster Meat

This section is designed with additional operation steps pertaining specifically to Cooked Whole Lobster and Cooked Lobster Meat.

13.3.2.1 Live Lobster Reception (Processing Step 1)

Refer to Subsection 13.3.1.1 of this document.

13.3.2.2 Live Lobster Holding (Processing Step 2)

Refer to subsection 13.3.1.4 of this document

13.3.2.3 Drowning or Pacifying (Processing Step 3)

Potential Hazards: Unlikely

Potential Defects: Unlikely

Technical Guidance:

- some species (not *Homarus*) are prepared for cooking by drowning suffocation in clean water with a low oxygen content or by immersing in chilled clean water;
- another possible process is an electric shock (pulse) in potable water, clean water or brine.

13.3.2.4 Cooking (Processing Step 4)

Potential Hazards: Microbiological contamination

Potential Defects: Over / undercooking

Technical Guidance:

- a cooking schedule for boiling or steaming should be designed which takes into consideration the appropriate parameters which can affect the cook such as time/temperature and size of the lobster;
- cooking should be carried out by appropriately trained personnel who have acquired the necessary skills to monitor and ensure that all lobsters are given the same time/temperature exposure and adequate heat penetration during the operation ;
- each cooker should be equipped with a suitable thermometer to show the cooking operation temperature. Fitting of a recording thermometer is strongly recommended. A simple device to indicate time of cooking should be supplied.
- lobsters should be cooked according to size until the shell is uniformly orange-red in colour, and depending on the product, until the meat can be easily removed from the shell. Overcooking causes the meat to shrink excessively, lower yields and undercooking makes it difficult to remove the meat from the shell;

13.3.2.5 Cooling (Processing Step 5)

Potential Hazards: Microbiological contamination

Potential Defects: Unlikely

Technical Guidance:

- cooling times should be kept as short as possible and every effort should be made to avoid contamination of the product during this period;
- cooling should be done in a proper manner, immediately after cooking, to end it uniformly throughout the batch and to avoid holding at temperatures which would encourage the growth of bacteria;
- cooling should be done in cold circulated air, running potable water or clean sea water;
- where lobsters are cooked on a continuous basis, cooling is also best done on a continuous basis;

- the same water should not be used for cooling more than one batch;
- shell removal should not be performed until the product has adequately cooled;
- care should be taken to ensure that cross contamination of cooked lobsters does not occur;
- cooked lobsters should be handled as a ready-to-eat product that has its normal microflora destroyed which can allow pathogens to proliferate.

13.3.2.6 Trimming (Processing Step 7)

Potential Hazards: *Microbiological contamination*

Potential Defects: *Unlikely*

Technical Guidance:

- an adequate supply of clean sea water, potable water or water as outlined in section 13.1.2 should be available to remove adhering coagulate protein. Spray washing on a conveyor is sometimes sufficient but it may be necessary to brush by hand. These methods can be combined;
- all surfaces and brushes should be frequently cleaned during operation in order to minimise the microbial activity of contact surface and utensils;

13.3.2.7 Shucking, De-veining and Washing (Processing Step 6)

Potential Hazards: *Microbiological contamination*

Potential Defects: *Presence of shell fragments*

Technical Guidance:

- the shucking and de-veining of cooked lobsters should be done quickly and carefully, in order to provide an attractive product;
- care should be taken to prevent cross-contamination of cooked product with raw lobster or any questionable material;
- depending on the vessel or processing facility product flow pattern and where a prescribed critical limit for staging time and temperature regime has been established for the control of hazards, the shucked or de-veined cooked lobster should be washed and appropriately chilled in clean containers and stored in specially designated and appropriate areas within the processing facility;
- lobster meat should be thoroughly washed on all surfaces in cold potable water, clean sea water or water as outlined in section 13.1.2;

13.3.2.8 Grading/Weighing/Wrapping (Processing Step 8)

Potential Hazards: *Microbiological contamination*

Potential Defects: *Incorrect grading, inadequate wrapping, inappropriate packaging material, incorrect net weight*

Technical Guidance:

- lobster should be graded into species, sizes and weights for the relevant market, to assure the economic integrity of the final product;
- lobster meats should be uniform in size;
- calibrated balances should be provided for accurate grading;
- balances should be calibrated periodically with a standardized weight to ensure accuracy;
- wrapping material should be clean, sound, durable, sufficient for its intended use and of food grade material;

13.3.2.9 Chilling (Processing Step 9)

Refer to sections 4.2 – Time and Temperature Control.

Potential Hazards: *Microbiological contamination*

Potential Defects: *Deterioration*

Technical Guidance:

- chilling lobsters in refrigerated sea water is not recommended because excessive salt penetration into the muscle will take place rapidly. However, refrigerated clean water systems can be used for rapid pre-cooling before freezing or storage in ice;
- chilling should take place as rapidly as possible to prevent microbiological growth and deterioration.

13.3.2.10 Freezing (Processing Step 10)

Refer to section 8.3.1 – Freezing Process

Potential Hazards: Unlikely

Potential Defects: Unlikely

Technical Guidance:

- air blast, liquid nitrogen, or other freezing methods should be rapid to produce high quality whole lobsters and lobster meats to ensure that the textural qualities of the product are retained;

13.3.2.11 Glazing (Processing Step 11)

Refer to Section 13.3.1.10 of this document

13.3.2.12 Final Packaging/Labelling (Processing Step 12)

Refer to Section 8.2.3 – Labelling.

Potential Hazards: Absence of labelling of allergenic additives

Potential Defects: Subsequent dehydration, incorrect labelling.

Technical Guidance:

- packaging material should be clean, sound, durable, sufficient for its intended use and of food grade material;
- care should be taken to ensure that exposed lobster meats are completely wrapped to protect against dehydration.

13.3.2.13 Chilled Storage (Processing Step 13)

Refer to Section 8.1.2 – Chilled Storage

Potential Hazards: Microbiological contamination

Potential Defects: Decomposition, foreign matter

Technical Guidance:

- temperatures in chilled storage should be 4° C or less;
- product should be properly protected to avoid contamination by condensates and splashing water;

13.3.2.14 Frozen Storage (Processing Step 14)

Refer to Section 13.3.1.12 of this document.

13.3.2.15 Packaging/Label Reception (Processing Step 15)

Refer to Section 13.3.1.13 of this document.

13.3.2.16 Packaging/Label Storage (Processing Step 16)

Refer to Section 8.5.2 – Storage – Packaging, Labels & Ingredients.

Potential Hazards: Unlikely

Potential Defects: Contaminated Packaging Material.

Technical Guidance:

- packaging material should be protected from dust, dirt and other sources of contaminants;
- Pests and insects should be excluded from the packaging storage area;

13.3.2.17 Distribution and Transport (Process Step 17)

Refer to Section 17 –Transport