Cattle and Swine Trucking Guide for Exporters



CONTENTS

Introduction

Preconditioning

Feeding and Watering

Veterinary Care

Stress Reduction

Transport Vehicles

Vehicles' Description

Vehicles' Construction and Accessories

Legal Limitations on Operation of Trucks

Preparation of Transport Vehicles to Carry Animals

Bedding

Ventilation and Temperature Considerations

Cleaning

Maintenance of Transport Vehicles

Loading

Loading Facilities

Loading Chutes

Minimize Stress During Loading

Stocking Densities

Separation of Animals When Loading

Qualifications for Livestock Handlers

Care During Transit

Good Practices For Drivers

What To Do During Adverse Weather

Maximum Transit Time

Use of Rest Stops

Unloading

General Considerations for Unloading

Unloading Chutes and Facilities

Post-transit Feeding, Watering, and Coordination

General Considerations

Cattle

Swine

In Summary

References

Appendix A: Handling Downed Animals

Appendix B: Nationwide List of Rest Stops

Appendix C: Livestock Weather Safety Index

Introduction

In 1998 over 180 million cattle, calves, swine, sheep, and lambs were marketed in the United States.⁽¹⁾ That same year, U.S. exports of these same species amounted to well over one million. Whether the animals are destined for domestic markets, border countries, or to airports and seaports for foreign offshore markets, highway transport plays a vital role in this marketing process. The keys to a successful outcome are careful and efficient planning and proper follow-through to assure maintenance of the stock throughout the handling and transportation process. Such measures will also help maintain the market value of stock and reduce claims due to injury and mortality. This guide will address many important aspects of livestock highway transport, from the planning stage, through loading procedures, and finally, unloading at final destination or port for onward journey. It is designed as a practical reference for use by shippers, carriers, receivers, and others in the livestock industry to help assure safe and efficient livestock highway transport.

Livestock export shipments are subject to numerous regulations; however, the focus of this guide is on technical aspects of transporting livestock over the road. Although many species of livestock are commonly carried by truck, the scope of this guide is limited to cattle and swine.

Preconditioning

The first step in livestock transport is getting animals ready for their trip. Treatment of animals before transit affects their ability to withstand the rigors of transport, which has a major influence on their condition upon arrival at final destination. Proper feeding and watering, appropriate veterinary care, and proficient handling before transport will help assure trouble-free transport and delivery of healthy stock.

Feeding and Watering

Appropriate pre-transit feeding and watering will help reduce transport stress and maintain the health of stock during transport. Factors such as what kind of feed animals are accustomed to, weather conditions, and species influence pre-transit feeding and watering requirements. Since these factors vary with each shipment, feeding and watering practices for individual groups of animals should be determined on a case-by-case basis. The following guidelines were developed from publications on livestock highway transport and from recommendations of persons who have extensive experience in carrying livestock over the road.

Pre-transit Diet

- Ship only animals that have been on a healthy diet. Well-nourished animals will have strength and body reserve that will help them withstand stresses brought on by the rigors of transport.
- Provide ample water before transport. How much water animals need before a trip is influenced by pre-transit diet. Animals that have been on green pasture or moist feeds get a substantial amount of their water from what they eat. However, once they are transferred to pens and placed on a diet of hay or dry feed, their water consumption will increase.
- Withhold feed from animals for a few hours before transport during extremely cold weather. This helps prevent wind chill caused by animals soiling each other when they are in transit.
- Prevent animals from consuming an excessive amount of feed before transport. Overfilled cattle are uncomfortable during transit and often become ill. This can bring on nervousness and excessive pushing and shoving.
- Avoid giving green feeds, succulent feeds,⁽²⁾ concentrated feeds⁽³⁾ and high energy feeds⁽⁴⁾ to mature cattle before transit. However, finished cattle for slaughter that are acclimated to a high-energy feed may remain on that diet. Green or succulent feeds will cause animals to have very wet manure, resulting in their soiling each other during transit. Concentrated feeds and high-energy feeds can cause mature cattle to have digestive problems.

- Condition cattle to good-quality hay⁽⁵⁾ or grain-based feed⁽⁶⁾ for 7 to 10 days before transport. This will enable them to better withstand transport and lose less weight. Cattle that have been fed on pasture will lose the most weight during transport. Also, cattle will not make best use of feed provided at rest stops unless previously conditioned to hay.
- Feed cattle 50 to 75 percent long hay⁽⁷⁾ and 25 to 50 percent grain-based feed for 24 hours before transport. Percentages of hay and grain depend on maturity of cattle. Older cattle get less grain and more hay. Hay will help to keep their rumination system functioning. If rumination stops, medication may be needed to restore normal digestion. Feeding grain-based feed will give cattle energy to help withstand transport.
- Provide cattle with water up to time of transport to help reduce weight loss. However, do not to let them drink excessively, as they may become sick during transport.

Special Considerations for Calves

- Condition newly weaned calves to hay and/or grain 3 to 4 weeks before transit. This will reduce transport stress and help prevent sickness during transport.
- If feeder calves will travel for more than 8 hours, feed them a grain-based concentrate for at least 24 hours before shipment. Grain is better than hay for feeder calves, because they perform better during long-distance shipment. However, if calves are accustomed to eating hay do not abruptly change their diet. Allow at least a 4- to 5-day gradual conversion to an all-grain diet.

Special Considerations for Swine

• Feed swine lightly with regular swine feed, consisting of ground corn with a soy base, prior to transport. If swine are not fed prior to transport they may lose considerable weight during the first part of the trip. Swine should not be fed too heavily before a trip, because they have a tendency to become ill during transport. Swine that have been off feed for more than 12 hours may lose weight excessively. However, they can be kept off feed before short trips to avoid their becoming sick during transport.

Water Quality

• Give good-quality water ⁽⁸⁾ to stock prior to transport. High salinity may cause excessive consumption. Water which has a hydrogen-ion concentration (pH) that is too high or low can cause digestive upsets. Water should be clean and free of contaminants. Do not give water to animals that contains algae, as some species of algae are toxic to animals. Animals that are not used to chlorinated water may shy away from it. Be sure to carefully follow instructions for use of any chemicals that are added to water for purification.

Animal Background

- Make sure that animals in holding areas are not reluctant to consume water. Some stock may need to be acclimated to feedlot conditions before they will drink freely. For example, range animals may be reluctant to drink from troughs or small water dispensers.
- Allow animals that have been through handling or sorting to rehydrate before being loaded.

Veterinary Care

Appropriate veterinary care helps to sustain health of stock during transport and is a legal requirement under some circumstances.

- Assure that animals in export shipment meet health requirements of the importing country. Examination must be done by a USDA Animal and Plant Health Inspection Service (APHIS) veterinarian or a veterinarian accredited by APHIS. Contact the APHIS Area Veterinarian in Charge (AVIC) in any State for information on examination of animals for export shipment. Addresses and phone numbers of AVICs can be found in section 6, Livestock Export Inspection Facilities.
- Check with appropriate State authorities to find if any regulations apply. Some States may have requirements concerning veterinary care for animals in transit through their jurisdictions.
- Give livestock medication for any potential diseases before export shipment.

Stress Reduction

Good handling will minimize stress caused by unfamiliar surroundings, frequent movement, examination, etc. For more information on handling, see <u>Minimize Stress</u> <u>During Loading</u> and <u>Qualifications for Livestock Handlers</u>. <u>Appendix A, Handling</u> <u>Downed Animals</u>, also contains information that pertains to handling.

• Precondition animals that are accustomed to isolated range and pasture to the presence of people. This is one of the ways to reduce transport stress that may prevent weight loss. The stock will be easier to handle and more willing to enter strange environments once they are acclimated to people.

Transport Vehicles

Livestock often spend an extensive amount of time in a vehicle during highway transport. Livestock in transit are under a great deal of stress because of constant changes in environment. Vehicle selection can help to reduce stress and greatly influence the success of any livestock highway shipment by facilitating handling and helping to maintain the comfort of stock during transport.

Vehicles' Descriptions

Five types of vehicles are commonly used for livestock transport. The following descriptions and illustrations of these vehicles will help shippers select vehicles that best suit their needs. Click on the hyperlink after each vehicle description to see illustrations.

Possum Belly Trailer

Length - 46-53 ft (14.0-16.2 m) in 6-in (15.2-cm) increments

Width - 96 and 102 in (243.8 and 259.1 cm)

Configuration - 2, 3, or 4 decks, depending on the species and size of animals to be hauled

Most common use - Long haul

Special Feature - Equipped with interior ramps for animals to walk to and from decks

Advantages - Designed to make maximum use of space

- Can easily and quickly be adapted to accommodate various size animals

- Can be custom built

- Generally considered best general-use trailer for carrying large lots of animals over long distances

Disadvantage - May not be well suited for hauling swine, because these animals tend to resist walking up and down ramps. This results in undue stress. Some possum belly trailers are constructed with gradual slopes to minimize this problem.

(See figures $\underline{1}$ and $\underline{2}$.)

Straight Trailer

Length - 46-53 ft (14.0-16.2 m) in 6-in (15.2-cm) increments

Width - 96 and 102 in (243.8 and 259.1 cm)

Configuration - 1, 2, or 3 decks, depending on the species and size of animals to be hauled

Most common use - Long haul

Special Feature - Equipped with interior ramps for animals to walk to and from decks

Advantages - Preferred by some swine shippers because they do not stress animals by requiring them to walk up and down as many ramps as some possum bellies

- Can be custom built

Disadvantage - Does not make maximum use of space

(See figure $\underline{3}$.)

Gooseneck Trailer

Length - 16-40 ft (4.9-12.2 m)

Width - 5-7 ft (1.5-2.1 m)

Configuration - One or two decks

Most Common Use - Short haul

Special Feature - Some are equipped with a ramp that is used for loading and unloading the upper deck

Advantages - Well suited for small lots of animals

- Does not require loading chute

- Some goosenecks with two decks have a ramp for loading the upper deck

- Can be maneuvered in tight spaces

- Can be pulled by a pickup or truck much smaller than a semi tractor

Disadvantage - Not well suited for large lots of animals

(See figure $\underline{4}$.)

Pup Trailers

Length - Usually 20-28 ft (6.1-8.5 m)

Width - Usually 96 and 102 in (243.8 and 259.1 cm)

Configuration - Usually two decks

Most Common Use - Short and long haul

Advantages - Well suited for hauling small lots of animals

- Can be maneuvered in tight spaces

- Can be pulled individually or in tandem (one behind the other) by a semi tractor or behind a straight livestock truck

- Can be pulled for a short distance by a farm tractor

Disadvantages - Less space-efficient than some other types of trailers

- When pulled in tandem are subjected to road restrictions placed on double trailers

(See figure 5.)

Straight Truck

Length - Generally 18-20 ft (5.5-6.1 m), but can be as short as 10 ft (3.0 m)

Width - Varies, but generally no more than 96 in (243.8 cm)

Configuration - Usually one deck

Most Common Use - Short haul

Advantages - Well suited for small lots

- Can be maneuvered in tight spaces

Disadvantage - Not well suited for large lots of animals

(See figure $\underline{6}$.)

Figure 1. Possum belly trailer with punched sides.



Figure 2. Typical configurations for possum belly trailers.



Figure 3. Straight livestock trailer with slatted sides.

					 	 **********	 	********				
X 4111 A 11 A 11 A 11 A 11 A 11 A 11 A 1	CONTROL OF CO.	COLT OF THE EXPLOS	2100-20-32-52-52-5		 	 	 					40 X4XX4 X40-X4
A 977.97.99.997.85		10.010.010.000	**************		 ********	 ********	 		***********			**********
		*************			 	 	 					******

												1 11
												1 11
												1 11
	_											
									$\sim $		~ 1	
									· \ \	11	$\rightarrow \gamma \uparrow$	
								- 4 (- 1		
				-					-))		11	
								· · · ·	\smile /	\sim	~ / _	
			<i>–</i>	٩.							- /	
			<u> </u>]					\sim	~		
			~									

Figure 4. Gooseneck trailer with slatted sides.



Figure 5. Pup trailers hooked in tandem.



Figure 6. Straight truck with slatted sides.



Vehicles' Construction and Accessories

Livestock trucks can be constructed or equipped in various ways to meet requirements of shippers and specific needs of the animals being hauled. Some of the most common ways follow.

Vehicle Construction

- *West Coast doors* are installed on the sides of livestock trailers near the back. These doors are used when there is insufficient maneuvering space to permit trucks to back up to loading areas.
- *Punch side trailers* have solid sides with holes punched for ventilation. These trailers are the most common. Truckers say that they are stronger and require less maintenance. Some maintain that punched sides cause less bruising.
- Slatted side trailers are constructed with horizontal slats on the sides.
- *Three-axle trailers* are manufactured for hauling heavier loads and better weight distribution. These trailers are used mainly in the Northwest. Their main disadvantage is that highway weight limitations may prohibit their use in some areas (see Legal Limitations on Operation of Trucks).
- *Air ride suspension systems* for livestock trailers are just coming into use. This type of trailer will provide a smoother ride for animals. When purchasing an air ride suspension trailer, be sure that it is equipped with an appropriate leveling valve that will equalize pressure so that weight will be evenly distributed.

Accessories to Meet Special Needs

• *Sprinkler systems* are installed in some trucks used for hauling swine. Swine are extremely sensitive to temperature extremes and research has shown that performance will improve if swine in-transit are sprinkled at half-hour intervals when the ambient temperature is more than 80° F (27° C). These sprinkler systems may operate from an external water source or trucks may be equipped with storage tanks. Livestock haulers should note that carrying water on the road to sprinkle swine will add considerable weight to a truck and make compliance with legal weight limitations difficult. Shippers and carriers should note that water leaking from trucks in which swine are sprinkled will contain manure. Authorities may impose fines if this occurs. Use of good absorbent bedding will greatly help to minimize this problem (see <u>Bedding</u>). See <u>Livestock Weather Safety Index</u>, appendix C, for additional information on hauling swine during hot weather.

Caution: Never put a large amount of cold water on overheated swine. This may cause shock, possibly resulting in death.

- *Interior lights* make night loading easier. Livestock, especially swine, are more willing to move into lighted trucks.
- *Partitions* are often used when hauling a partial load so that animals can be forced to stand close together to provide stability. They should also be used to separate different sizes and species, and to separate sick or injured animals from the rest of the load. Partitions can also be used in large trucks as baffles to stabilize full loads, which is especially important during emergency stops. However, using partitions in full loads may reduce the number of animals that can be carried. Partitions can also be used to prevent large groups of swine from huddling together during cold weather shipments to keep warm. When they huddle together, they may form a large pile which can result in suffocation of swine at the bottom of the pile. (See <u>Weather Considerations With Regard to Stocking Density</u> and <u>What To Do During Adverse Weather</u> for additional information on cold-weather hauling.)
- *Covers* for slatted side trucks and *hole plugs* for punch side trailers are available for hauling during cold weather. (See <u>Ventilation and Temperature Considerations</u> for additional information.)

Legal Limitations on Operation of Trucks

Many laws and regulations govern weight and size of trucks, use of trailers hooked in tandem (doubles), how many hours a driver may be on the road, etc. Check with appropriate State agencies for information on laws and regulations that apply to operation of trucks. "Highway Regulatory Guidelines for Farm Equipment Operators," published by the Upper Great Plains Transportation Institute, North Dakota State University, Fargo, ND, contains detailed information regarding laws and regulations governing operation of trucks. Copies are available free of charge. Call William Dunton at (202) 690-2330 or write USDA Agricultural Marketing Service, Transportation and Marketing Division, P.O. Box 96456, Room 1217-S, Washington, DC 20090-6456.

Preparation of Transport Vehicles To Carry Animals

Properly prepared vehicles help to prevent injury to stock, maintain contentment of animals, and reduce the possibility of disease transmission. Good bedding, adequate ventilation, thorough cleaning, and careful vehicle maintenance all help to provide a favorable environment for transport.

<u>Bedding</u>

Proper bedding will help assure safe transport conditions and enhance animal comfort. Bedding material absorbs animal waste and helps to provide good footing. It also helps to keep animals warm during cold weather and prevent overheating during warm weather. Only use bedding that is clean and free of contamination. Sanitation is essential to deter spread of pests and diseases, especially during export shipment. Four materials are used for bedding: sawdust, wood shavings, straw, and sand.

- *Sawdust* is absorbent and light. Softwoods, such as pine, are better than hardwoods because they are more absorbent. Sawdust is good for warm-weather shipments because it does not generate heat and it can be moistened to help keep animals cool. Sawdust bedding should be used for swine shipments when the ambient temperature is more than 60° F (16° C).
- *Wood shavings* have much the same characteristics as sawdust.
- *Straw* is highly absorbent and light. It generates heat that helps keep animals warm during cold weather shipments. However, the heat-generating characteristics of straw are a disadvantage when temperatures are high. Heat-sensitive animals, such as swine, should never be bedded with straw during warm weather. Another disadvantage of straw is that when it becomes saturated, it causes slippery conditions. Some truckers do not like straw bedding because it clogs trailer drains, thus making cleaning difficult.
- *Sand* is absorbent and like sawdust and wood chips it can be moistened to help keep animals cool. A major advantage of sand, unlike other bedding materials, is that when it gets wet, it will still provide extremely good footing. Some truckers like to have sand handy during loading and unloading to throw on the floor of the truck near the tailgate, because bedding often is pushed away from this area, causing the floor near the tailgate to become slippery. The main disadvantage of sand is that it is abrasive. Some truckers prefer not to use sand because it wears trailer floors. Another disadvantage is that it is heavier than other bedding materials.
- Deciding how much bedding to put in a truck requires judgment based on factors such as the amount of time animals will be in transport, species, and time of year. Generally, sawdust and wood shavings should be about 2 in (5 cm) deep, straw 3-4 in (8-10 cm) deep, and sand at least 1 in (3 cm) deep.

Ventilation and Temperature Considerations

Poor air circulation, unfavorable air composition, and temperature extremes can greatly affect animals already stressed by constant handling and changes in environment. Transport vehicles must allow enough air to satisfy breathing requirements of animals, and air change must be great enough to control the concentration of gases and odors. Sufficient ventilation must be provided, especially during hot weather, to compensate for animals' increased respiration. Ventilation must also be sufficient to dissipate any buildup from animals' natural heat production. During cold weather, precautions should be taken to assure that animals do not become excessively chilled.

Ventilation

- Holes in punch side trailers are flared so that a vortex is created. This enhances ventilation by drawing air into trailers when they are moving.
- Diesel exhaust fumes have an adverse effect on livestock. Studies have shown that it takes animals weeks to recover from effects of prolonged exposure. Calves hauled on top decks of trailers pulled by tractors that had exhaust stacks 14-24 in (36-61 cm) below the roof did not gain weight after transport as fast as those hauled on the bottom decks of those trailers. Differences have been observed up to 70 days after transport. Exhaust stacks on tractors that pull livestock trailers should be at least as high as the trailer roof.

Temperature

- Some livestock trailers are equipped with nose vents that can be opened during hot weather to enhance ventilation. They are especially important to maximize ventilation when trucks are not moving. Always close these vents during cold weather.
- Side covers are available for slatted side trucks used for hauling swine or other temperature-sensitive species. These covers shield all or part of truck sides during cold weather hauls. How much of the truck sides are covered depends on ambient temperature, number of animals being hauled, travel time, and condition of animals.
- Plastic plugs are available for covering holes in punch side trailers used to haul swine or other temperature-sensitive stock when temperature is low. Again, how much of the truck sides are covered depends on ambient temperature, number of animals, travel time, and condition of animals.
- Background of animals is a major consideration when deciding how much protection they need from temperature extremes during transport. For example, cattle transported from Florida to New England in January may be sensitive to abrupt temperature decreases. Conversely, animals transported from New England

to Florida during the winter may have difficulty adjusting to abrupt temperature increases. Animals from colder regions may also be sensitive to temperature increases if transported to warmer regions during the summer. Also, livestock that have been kept indoors may react unfavorably when exposed to outdoor conditions.

• For related information on ventilation see <u>Weather Considerations With Regard to</u> <u>Stocking Density</u> and <u>What To Do During Adverse Weather</u>.

<u>Cleaning</u>

Clean trucks are especially important for export shipment because all livestock export shipments must meet the importing countries' regulations designed to protect against entry of diseases and pests. Trucks used for export shipment must be thoroughly cleaned and disinfected before loading livestock. The following practices are commonly used to assure that livestock trucks are clean and disease free.

- Wash out with a high-pressure hose or scrub trucks used for export shipment before loading. All caked-on waste should be washed from walls and floors.
- Use disinfectant in the washing process. It may be mixed with the wash water or be applied from disinfectant containers during washing out or scrubbing. Use only disinfectant recommended for animal facilities. Be sure to follow the manufacturer's instructions and observe all safety precautions. In some cases, exporters may be required to use a disinfectant approved by the USDA's Animal and Plant Health Inspection Service (APHIS). A list of approved disinfectants may be obtained by contacting the office of an APHIS Area Veterinarian In Charge (AVIC) in any State. See section 6 (Livestock Export Inspection Facilities) for addresses and phone numbers of AVICs
- Use hot water as an alternative to clean and disinfect trailers. The temperature should be at least 180° F (82° C).
- Clean manure from trucks to assure that legal weight limits are met.
- Be careful not to pollute ground water, lakes, and streams and comply with all environmental laws and regulations when disposing of waste and water used for cleaning trucks.
- Use waste from truck cleaning as fertilizer, if desired. Some livestock carriers collect solid waste by screening water being drained from trailers during washing. They also collect water from washing and store it in ponds. Both the solid waste and water are given to farmers who spread them on their fields.

Maintenance of Transport Vehicles

Any delay or injury to animals during transport can be costly. Delays caused by mechanical breakdowns can seriously disrupt carefully planned schedules which are extremely crucial to export shipments. Poorly maintained vehicles may also be unsafe to operate. If vehicles' interiors are not properly maintained, animals may sustain injuries during transport. These injuries may result in decreased value of stock, require costly emergency veterinary services, and can even necessitate destruction of animals. The following precautions will help prevent mechanical breakdowns, assure safe vehicle operation, and prevent injury to stock.

Preventing Breakdowns and Assuring Safety

- Maintain trucks and trailers as recommended by manufacturers.
- Service and replace tires, brakes, and lights as needed, and comply with all laws and safety regulations.

Preventing Injury to Stock

- Keep interiors of transport vehicles in good repair so that there are no sharp edges or protrusions, such as nails, bolts, and hinges, on which animals may cut themselves.
- Make certain that truck floors and ramps have non-slip surfaces or are covered with bedding material to prevent animals from slipping.
- Ensure that floors have no holes or loose planks which animals may step through.
- Maintain truck gates that slide up to open, so that they will not fall on animals.

Loading

Injury and stress are likely to occur during loading. Conditions during loading can also significantly influence how animals fare during transport. This section discusses proper design of loading facilities and equipment, helpful techniques for minimizing stress when loading livestock, appropriate stocking densities in transport vehicles, necessary separation of animals in a load, and qualifications for livestock handlers.

Loading Facilities

Properly designed loading facilities (pens, alleyways, ramps, etc., in areas where animals are grouped for loading) enhance efficiency of livestock transport by minimizing stress, preventing injury to animals, and making loading quick and easy. Important design considerations prevent injury to stock and facilitate loading by taking advantage of animals' natural behavior.

Safety Design Considerations

- Ensure that loading facilities are free of protrusions that can cause injury to animals.
- Maintain gates that slide up to open and use them carefully, so that they will not fall on animals.
- Design facilities that will be used for large-framed animals with the animals' size in mind. Research has shown that large-framed animals are more likely to experience bruise-causing impacts during handling.
- Construct flooring in loading facilities of rough concrete or provide other non-slip surfaces to ensure good footing for animals.

Animal Behavior Design Considerations

- Cover loading chutes, especially new ones, with hay or straw, so that animals will be less reluctant to walk on them. Livestock prefer to walk on soft surfaces rather than steel or concrete.
- Fit gates that clang with rubber bumpers, so that they will not cause animals to balk.
- Use gates made of mesh or bars in loading facilities, so that cattle can see through them. Cattle tend to turn back when they see no avenue of escape. However, sides of ramps, alleyways, crowd pens used to assemble stock immediately before loading, etc., should be solid to prevent animals from seeing people and other distractions that may cause them to balk. Crowd gates (gates to crowd pens) should also be solid to prevent animals from turning back.

- Design loading facilities so that sharp turns and complex movements, which are confusing to animals, are avoided. Wide sweeping curves will facilitate animal movement.
- Design facilities so that animals do not have to cross floor drains. Livestock often resist walking over grates.
- Provide lighting in loading facilities that is even and diffused. Wide-angle vision and poor depth perception cause livestock to be extremely sensitive to differences in lighting. Some shadows can cause animals to balk. Avoid sharp contrasts, such as those caused by slatted shades. Also avoid harsh light that shines in animals' eyes. Cover lights with diffuser screens to avoid this.
- When loading livestock at night, light alleyways and loading chutes with increasing intensity toward the truck. This takes advantage of cattle and swine's natural tendency to move toward light. Illuminating truck interiors will induce animals to enter. Livestock are often reluctant to move into a dark area. Persuading animals to enter a dark single-file chute can be difficult.

Loading Chutes

Loading chutes are inclined ramps enclosed on both sides that livestock walk on to enter transport vehicles. They may be permanently mounted or portable. Permanently mounted chutes usually have steel sides and steel or concrete ramps. Portable chutes are usually constructed completely of steel. Sides of loading chutes are generally as high as the animals' heads. All loading chutes should have specific characteristics that facilitate movement of animals and help to prevent injury. They should be designed for the species and size of animals for which they are to be used.

Cattle

• Cattle loading chutes should be narrow so that animals can go single file into a truck. This takes advantage of cattle's natural tendency to follow a leader. Animals cannot turn around in the chute. Appropriate width of chutes varies with breed and age of animals. Chutes should not be made wider than necessary. If chutes are too wide, two animals can wedge if one tries to turn. This will result in delays and possible injury to stock.

Swine

• Swine loading chutes should be constructed so that animals can walk single file into a truck, or two abreast. Swine vary greatly in size, so chutes must be the appropriate width for the animals to be loaded. Do not use chutes that are 1 ¹/₂ animals wide, because this will cause animals to wedge in the chute, possibly resulting in injuries to stock and shipment delays.

Cattle and Swine

- Permanently mounted chutes used for cattle and swine should have steps or cleats to reduce slippage. Distance between cleats and dimensions of steps should match the stride of the animals using the chute.
- Steep chutes can cause slippage, especially in the winter. The slope of a permanently mounted chute should be no more than 20 degrees. The slope of portable adjustable chutes should not exceed 25 degrees. Swine tend to resist walking on steep slopes. If there is sufficient space, the slope of permanently mounted chutes for swine should be 15 degrees.
- Loading chutes should have non-slip surfaces to prevent animals from falling.
- Loading chutes that are used during daylight should be oriented north or south, so that animals will not have to look directly into the sun.
- Telescoping side panels and self-aligning bumpers on chutes help prevent animals from jumping out through the gap between the back of the truck and the chute.
- Loading chutes should be as short as possible, so that a handler can get to both ends quickly.
- Solid sides on loading chutes prevent animals from seeing outside. Even relatively insignificant things, such as reflections from car bumpers, can frighten animals and cause them to stop or try to move back. Sides should be high enough so that animals cannot see over them.

Minimize Stress During Loading

Transport stress brought on by unfamiliar surroundings and frequent handling is one of the most significant problems encountered during livestock highway transport. Stress can contribute to transport-related illnesses. Take the following measures to help reduce loading stress:

- Preplan livestock shipments. Transport vehicles should arrive on schedule to minimize time animals must be held in loading facilities. After letting animals settle for a few minutes, the vehicle should leave as soon as possible. This will help to prevent heat buildup and minimize time animals must be in the vehicle.
- Avoid mixing animals that are unfamiliar with each other to avoid fighting.
- Always keep handling time to a minimum. This will help keep animals settled. Livestock will lose more weight when they are moving than when they are quiet.

- Sort animals before loading. Group animals by size, species, origin, etc., prior to loading the truck.
- In the event cattle are dipped,⁽⁹⁾ allow them to dry thoroughly before loading.
- Protect animals from freezing rain and sleet. Precipitation in this form can be deadly to animals. Even cattle with heavy coats will not be protected against chilling caused by saturation of freezing precipitation. Be certain to protect animals from prolonged exposure.
- Construct loading chutes and facilities according to prescribed recommendations (see Loading Facilities).
- Move animals with minimal excitement. Exciting animals more than necessary will not only result in increased stress levels but will increase susceptibility to bruise or other injury. Always move slowly and quietly around livestock. Yelling and beating animals (especially swine) will make them difficult to handle. Handling animals in an easy and friendly manner will minimize stress.
- Do not rush animals. Let animals follow the leader at their own pace.
- Be sensitive to differences in animal behavior due to breed and animal background. For example, Angus cattle are more excitable than Herefords, and swine raised indoors move more slowly than swine raised outside.
- When moving cattle, be aware of their flight zone. This is the area around an animal in which it feels secure. When a handler enters the flight zone, the animal moves away and will stop when the handler leaves the flight zone. Size of the flight zone depends on tameness of the animal.
- Use either a wide canvas slapper or an electric prod to drive animals. Cattle can also be driven with a plastic bag on a stick. They will quickly move away from the sound of the plastic. Never strike animals with such objects as sticks, pipes, canes, or forks.
- Use electric prods sparingly. They are somewhat controversial. Some livestock industry personnel prefer not to use electric prods. Excessive use of prods can drive animals into a frenzy. This is an especially important consideration when handling swine. If a swine is prodded several times in rapid succession, it may have a heart attack.

Caution: Never continue to prod a swine that lies down.

• After loading, let animals settle for a few minutes before moving the truck.

Special Considerations for Swine

- Movement of swine through loading facilities will cause exertion. For example, a swine's heart will beat much faster than usual when it is climbing a loading chute.
- Swine may suffer heart attacks due to overexertion. When a swine's heart starts to race, it will lay down to bring its heart rate to a safe level.

Caution: An overexerted swine must always be allowed to rest.

- If a swine collapses from overexertion, don't throw cold water on it. This will shock its system and may kill it. Instead, wet the ground around the swine to provide evaporative cooling.
- Porcine Stress Syndrome (PSS) is the leading cause of swine deaths during transport. Swine with PSS will suddenly lie down, pant, and tremble. The skin of white swine may have a red, splotchy appearance. Swine showing these symptoms must be allowed to rest or they are likely to die.
- When the temperature is over 80° F (27° C) sprinkle swine before loading to prevent them from becoming overheated.

Caution: Never put a large amount of cold water on overheated swine. This may cause shock resulting in death.

Stocking Densities

As with all modes of transport, one of the most vital decisions that must be made prior to livestock highway shipment is how many animals to load. Improper stocking density may result in excessive shrinkage, injury to stock, delivery of sick animals, and even fatalities. Livestock carriers should be sure to keep trucks within legal weight limitations and distribute loads evenly. Failure to do so may result in fines and cause vehicles to be unstable and difficult to control while on the road. Assure proper stocking density by following good loading practices, anticipating weather conditions, and considering size and condition of stock. There is a stocking density chart below.





Loading Practices With Regard to Stocking Density

- Always decide before shipment how many animals to put in a transport vehicle. Consider truck size, body shape and weight of animals, condition of animals, and weather conditions.
- Avoid overcrowding. It will cause excessive weight loss and stock will look bad at destination. Overcrowded loads tend to contain downed animals at destination. Any savings in hauling charges, due to reduced cost per head, will most likely be lost due to deterioration of stock. Animals that are loaded too densely become uneasy and perspire heavily, particularly during hot weather. Excess moisture produced from urine, manure, and breathing will cause hair and skin to become damp. When floors become exceptionally wet, animals may fall frequently. Animals that go down will have difficulty getting up and may be trampled resulting in injury or death. Cattle that are loaded too densely may also jam at the truck door during unloading. Overly tight loading should be avoided even for very short hauls.
- Partition transport vehicles if less than a full load is to be shipped. When animals are loaded too loosely, they may not have enough support and fall frequently during transport. Partitions in large trucks will also serve as baffles against excess movement during acceleration and braking and are especially important during emergency stops.

• Distribute weight evenly throughout the transport vehicle. If the load consists of different size animals, use partitions to distribute animals so the load will be balanced. This will also protect smaller animals from being trampled.

Weather Considerations With Regard to Stocking Density

- During cold weather, tight loading may tend to decrease weight loss because animals will stay warmer.
- Tight loading during hot weather will contribute to heat buildup and cause fatigue. Overly fatigued animals will tend to lie down at destination and they will be reluctant to eat and drink. This is an especially important consideration for swine transport, because swine are very heat sensitive. Tight loading of swine during hot weather will increase death losses. During hot weather reduce stocking density for swine. They should be loaded less tightly in the back of the transport vehicle to avoid heat buildup. Stocking density for cattle should also be reduced slightly during hot weather. (See <u>What To Do During Adverse Weather</u> and the <u>Livestock Weather Safety Index</u>, appendix C, for additional information.)
- When determining stocking density by weight, keep in mind that wet or rainsoaked animals will weigh more than dry animals.
- When deciding stocking density during hot weather, bear in mind that animals produce heat, most of which must be dissipated. Table 1 (below) gives heat production figures for several sizes of cattle and swine.

Table 1. Animal heat production											
Type of Animal	Animal V	Veight	Heat Pro	duction	Total Heat Production						
	Lb	Kg	Btu/Hr./ Lb	Kj/Hr./Kg	Btu/Hr.	Kj/Hr.					
Pig	25	11	9	20	225	220					
Hog	550	249	7	16	3850	3984					
Calf	300	136	5	11	1500	1496					
Cow	1000	454	3	7	3000	3178					

Stocking Density With Regard to Condition and Size of Stock

Use good judgment when deciding how many animals to put in a transport vehicle. Determinations can't be made by weight alone because animals vary in size and body shape. Many factors influence how many animals can be loaded in a truck.

• Breeds that tend to be especially tall and narrow can be loaded more densely than breeds that tend to be short and wide.

- Horned animals may need to be loaded less densely, because horns and tips can cause bruises; how much less depends on size and sharpness of horns.
- Pregnant animals should be loaded less densely. They will require more room to get up if they go down.

Separation of Animals When Loading

Under some circumstances an animal or group of animals may need to be separated from others in a load to avoid injury during transport. Some examples follow:

- Separate different species and vastly different size animals.
- Isolate pregnant animals.
- Avoid mixing swine and cattle from different farms during transport to avoid fighting.
- Segregate horned animals from hornless animals.

Qualifications for Livestock Handlers

Proper loading techniques and adequate training of animal handlers contribute greatly to safety and efficiency of loading. Despite good facilities, poor handling will cause undue stress, possibly resulting in reduced quality of stock and injury to animals. Good handling depends on handler's attitude and understanding of how animals will react.

- Ensure that persons who handle livestock have a basic understanding of animals' behavior and physical needs.
- Impress handlers with the effect their actions can have on animals in their charge.
- Teach handlers that use of persuaders such as prods and whips should be minimized.
- Ensure that there is a commitment to proper handling from everyone, from the top down, involved with the livestock shipment.
- Develop training programs for handlers when necessary.

Care During Transit

Appropriate care during transport will help assure delivery of healthy stock and prevent in-transit injuries. Proper care should be a priority, no matter the length of the trip. Sometimes animals lose more weight on short hauls than on long hauls. There is a reason for this. Animals traveling long distances get first class service--no crowding, good bedding, and rest stops at proper intervals with free access to feed and water. Animals traveling only a short distance don't always get this quality care because it is sometimes thought to be unimportant for short trips. This section contains recommendations on good practices for drivers, what to do during adverse weather, maximum transit time, and use of rest stops.

Good Practices for Drivers

Truck drivers play one of the most important roles in livestock highway transport. Usually they must take sole responsibility for the welfare of animals on the road. How drivers operate vehicles, how much time they spend checking on animals' welfare, and how well they are prepared to deal with emergency situations greatly influences the outcome of any livestock highway shipment. Drivers who observe the following procedures will help assure arrival of stock in good condition.

- Start out slowly and avoid fast stops. Fast starts and stops, taking curves too fast, etc., will knock animals down.
- Keep loaded livestock trucks moving, especially during hot weather. This will maintain a constant air flow that will help keep animals cool and prevent buildup of gases from animal wastes.
- Plan to make periodic stops during transport to check welfare of stock (Are there any downers? Do any appear ill? Are they too cold or overheated?). Also make vehicle security inspections when checking animals during a stop. Make sure load partitions are in place and secure, trailer doors are securely closed, and bedding is sufficient. Generally, stops should be 4 to 5 hours apart. However, drivers need to use judgment when deciding how often to stop to check animals, considering condition of animals, weather, and road conditions.
- Be prepared to make decisions or get instructions promptly about care of stock regarding weather conditions, animals' need for food or water, and what to do with sick or injured animals.

What To Do During Adverse Weather

Exposure to temperature extremes and other adverse weather can have a detrimental effect on livestock. Extremely high or low temperatures will stress animals, possibly causing excessive weight loss, illness, or death. Be sensitive to climatic conditions at animals' origin and destination.

Hot Weather

- Haul livestock at night or early in the morning during hot weather. Occasionally it may be advisable to postpone transport until weather conditions become more favorable. The <u>Livestock Weather Safety Index</u>, appendix C, gives details on hauling during hot weather. Although this chart was developed primarily for swine transport, it can serve as a general guideline for cattle, too.
- If possible, sprinkle swine during transit when the temperature is more than 80° F (27° C). Although this may not be feasible on the road, studies have shown that sprinkling swine at ½-hour intervals during transit, when the temperature is above 80° F (27° C), considerably improves performance and slaughter yields. Swine that are sprinkled in-transit are also quieter and more content. This reduces trampling and crowding. Some trailers built for hauling swine have built-in sprinkler systems. Shippers and carriers should be aware that water from sprinkling that drains onto road surfaces will contain manure. Some authorities may impose fines if this occurs. Carrying water will also add considerable weight to a truck.

Caution: Never put a large amount of cold water on swine that are overheated. This may cause shock resulting in death.

- Use appropriate <u>bedding</u> material for hot weather.
- Provide drinking water to animals as often as possible during hot weather.

Cold Weather

• Protect livestock from wind chill during cold weather. Swine are especially sensitive to chill cross winds (see table 2, below). Air movement through trucks can be restricted by using side covers or plastic plugs described on page 17 to partially block air movement through trailers. Be careful to maintain adequate ventilation.

AMES WIND CHILL INDEX

For Cattle and Shorn Sheep

(Dry Animals)

Actual Temperature

Table 2. Wind chill charts															
	F	С	F	С	F	С	F	C	F	C	F	C	F	C	
Wind Speed		-10	-23	0	-18	10	-12	20	-7	30	-1	40	4	50	10
MPH	KPH	Wind Chill Factor													
10	16	-20	-29	-10	-23	0	-18	9	-13	19	-7	29	-2	39	4
20	32	-37	-38	-27	-33	-17	-27	-7	-22	2	-17	12	-11	22	-6
30	48	-53	-47	-43	-42	-33	-36	-23	-31	-13	-25	-3	-19	6	-14
40	64	-60	-51	-50	-46	-40	-40	-30	-34	-20	-29	-10	-23	0	-18

Note: All Centigrade temperatures were converted from Fahrenheit and rounded to the nearest whole number.

WIND CHILL INDEX FOR SWINE

Actual Air Temperature															
	F	C	F	C	F	C	F	C	F	C	F	C	F	C	
Wind Speed		50	10	40	4	30	-1	20	-7	10	-12	0	-18	-10	-23
MPH	KPH	Wind Chill Factor													
5	8	48	9	36	2	27	-3	17	-8	5	-15	-5	-21	-15	-26
10	16	40	4	29	-2	18	-8	5	-15	-8	-22	-20	-29	-30	-34
15	24	35	2	23	-5	10	-12	-5	-21	-18	-28	-29	-34	-42	-41
20	32	32	0	18	-8	4	-16	-10	-23	-23	-31	-34	-37	-50	-46
25	40	30	-1	15	-9	-1	-18	-15	-26	-28	-33	-38	-39	-55	-48
30	48	28	-2	13	-11	-5	-21	-18	-28	-33	-36	-44	-42	-60	-51
35	56	27	-3	11	-12	-6	-21	-20	-29	-35	-37	-48	-44	-65	-54
40	64	26	-3	10	-12	-7	-22	-21	-29	-37	-38	-52	-47	-68	-56
45	72	25	-4	9	-13	-8	-22	-22	-30	-39	-39	-54	-48	-70	-57
50	80	25	-4	8	-13	-9	-23	-23	-31	-40	-40	-55	-48	-72	-58

Note: All Centigrade temperatures were converted from Fahrenheit and rounded to the nearest whole number.

Above charts were developed by Dr. David Ames of Colorado State University and published by the Livestock Conservation Institute.

- Swine hauled in cold weather tend to huddle together in piles. This sometimes results in death of swine at the bottom of the pile. Death occurs because as ambient temperature rises, swine on the top are still chilled and will not move, but rising temperatures result in excessive heat buildup toward the bottom and center of the pile. Bedding heavily with straw which will generate heat and using partitions to separate animals into small groups will help prevent this.
- Keep animals as dry as possible during cold weather. Shipment of wet animals may cause death from wind chill. Even the heavy coats of cattle will not protect them from wind chill when saturated.
- Protect animals from prolonged exposure to freezing rain and sleet. Precipitation in this form can be deadly to animals. Even the thick coats of cattle will not protect them against chilling caused by saturation of freezing precipitation.

<u>Maximum Transit Time</u>

When livestock are in transit too long, their health will be adversely affected. This section explains some factors that should be considered when determining how long animals should be on a truck.

- Keep transit time to a minimum. Studies have shown that animals continue to lose weight as long as they are in a truck. Trucks should be on the road as soon as possible after loading. Once trucks reach destination, unload animals as soon as possible.
- Mature cattle have been delivered in good condition after being carried for as long as 48 hours. However, experienced transporters feel that cattle should not be carried for more than 30 to 40 hours without rest. Generally, feeder calves should not be in transit for more than 34 hours without rest. Swine have been carried for as long as 36 hours without rest. However, they are stress-sensitive animals and therefore cannot withstand the rigors of transport as well as cattle. Deciding how long animals should be on the road requires good judgement. Maximum transit time depends on many factors such as weather, species, and condition of animals.
- Anyone who plans a livestock shipment should be aware that more rest stops than necessary may not be beneficial. Some experienced livestock transporters maintain that stress involved with frequent unloading and reloading of animals will defeat the benefits of rest. Research has shown that loading and unloading wilder cattle may be more stressful for them than riding in a vehicle. However, research results indicate that this does not affect fairly tame cattle. They appear to be stressed more by confinement in a moving vehicle. Swine are stressed by

frequent handling. Shippers and carriers should also note that whenever animals are moved off or on a truck, there is possibility of injury.

• There is much controversy about how long to rest animals in transit. Generally, experienced transporters say 8 to 12 hours is the minimum rest time for animals that have been in transit for 24 hours or more. The amount of time animals must be rested depends on many factors, such as weather, condition of stock, species, and time in transit before reaching the rest stop. Decisions on rest time must be made on a case-by-case basis.⁽¹⁰⁾

<u>Use of Rest Stops</u>

Rest stops are facilities where animals in transit for extended periods can be rested, fed, and watered during their journey. These facilities have holding pens and equipment to unload and reload stock. These pens may be located indoors or outdoors. Feed and water are usually provided by the operators. Improper feeding, watering, or poor care at rest stops can adversely affect stock. However, requirements of individual groups of animals vary, so feeding and watering practices should be determined on a case-by-case basis.

Feed

- Provide mature cattle a diet consisting of 50 to 75 percent good-quality hay and 25 to 50 percent grain-based feed at rest stops, depending on the maturity of the animals. Avoid feeding green, succulent, concentrated, and high-energy feeds (see footnotes 2, 3, 4, 5, and 6). However, feeder cattle that are acclimated to high-energy feed may stay on that diet. Green or succulent feeds will cause animals' manure to be wet. This may result in their soiling each other when they are in close proximity during transport. Soiling can result in excessive wind chill during cold weather. Concentrated feeds and high-energy feeds may cause mature cattle to have digestive problems.
- Provide feeder calves a grain-based concentrate feed at rest stops. However, abrupt changes in their diet may cause them to become sick. So if calves are accustomed to eating hay, it should be included in their diet.
- Give swine typical swine feed, consisting of ground corn with a soy base. This feed may be pelletized or ground. Be careful not to overfeed swine during rest stops, because it may cause them to become ill when transport resumes. Withholding feed from swine for a few hours before departure will help avoid this.

Water

• Provide livestock with good-quality, clean water at rest stops (see <u>footnote 8</u> for a reference on water quality for livestock). High salinity will cause animals to drink more, possibly resulting in excess consumption. Water with a too low or too high

pH can cause digestive upsets. Do not give water containing algae to animals. Some species of algae are toxic. Some animals may shy away from chlorinated water. Be sure to carefully follow instructions for use of any chemicals that are added to water for purification.

- Consider feeding animals before providing water. Some experienced cattle transporters prefer this because if cattle have immediate access to water, they may drink excessively and not eat. This is important during hot weather.
- Give cattle access to water up to time of departure, but be careful not to let them drink excessively. Cattle that consume large amounts of water tend to become ill during transport.
- Allow swine free access to water as much as possible during transport. This will help reduce weight loss.

Assurance of Proper Care

- Consider having an attendant accompany large shipments to assure that animals are properly cared for. The attendant can make sure that livestock are supplied adequate food and water at rest stops, and that they are given sufficient rest time.
- Be certain that feeding and watering facilities are adequate for the type of stock being transported. Calves may not be able to eat or drink from dispensers made for larger animals. Range animals may not drink freely from troughs or small water dispensers. If rest facilities are not adequate, a rest stop may serve only to prolong transport stress.
- Be certain rest facilities' managers take precautions to prevent spread of disease. Animal holding facilities should be kept reasonably clean and, when necessary, disinfected.

Unloading

Good unloading facilities and equipment and proper handling help assure completion of a successful shipment. Much of the information contained in the <u>loading section</u> of this guide also applies to unloading. This section explains factors that are unique to unloading.

General Considerations for Unloading

- Position trucks so that they line up properly with chutes.
- Cover chutes with bedding when unloading swine. This will help entice them out of the truck. The bedding will help cover the strange smell of the chute.
- Attend to any animals that arrive sick or injured as soon as possible. Call a veterinarian if necessary. Refer to <u>appendix A</u> for detailed information on handling animals that are so sick or so badly injured that they cannot get up.

Unloading Chutes and Facilities

Unloading chutes are inclined ramps that animals walk on to exit transport vehicles. They may be permanently mounted or portable. Permanently mounted chutes usually have steel rail fences on the sides and steel or concrete ramps. Portable chutes are usually constructed completely of steel. Good unloading chutes should be constructed as follows.

- Use wide chutes for unloading, because animals will go more readily into a wide area. Chutes used only for unloading should be 8 feet wide. This type of chute should not be used for loading.
- Construct unloading chutes with a non-slip, level landing at the top. It is easier for animals to exit a truck if they can step onto a level surface, as opposed to an immediate downward slope. This is especially important for swine. Cattle that are unloaded onto chutes that begin with stair steps or ramps may fall and are wary of going down the chute. This necessitates increased use of physical force by handlers which results in increased bruising. Landings should be 3 feet long for swine and 5 feet long for cattle.
- Be certain that chutes provide good footing. They should be constructed of rough surface concrete, have cleats, stair steps with deep groves, or other non-slip surfaces. Distance between cleats and dimensions of steps should match the stride of the animals being unloaded.
- Illuminate chutes and unloading areas during night unloading. Livestock feel more comfortable moving into a lighted area.

Exceptions to using chutes: In some cases, chutes are not used in unloading livestock at destination. For example, when cattle in export shipment are unloaded at an airport they are often moved directly from trucks into airline pallet pens.

Post-transit Feeding, Watering, and Coordination

Proper post-transit care will help stock to recover as quickly as possible from effects of transit and regain lost weight. Good care at destination will also help maintain the health of stock. The following feeding, watering, and shipment coordination practices will help assure that stock return to their pre-transit condition as soon as possible.

General Considerations

- Give animals an opportunity to rehydrate their body tissue as soon as possible after transit. This is especially important after hauls lasting 8 hours or more.
- Try to provide feed and water of the same quality that animals have been getting before transport. This will encourage them to fill back up rapidly. Animals have difficulty adjusting to feed and water that differs in quality from that to which they are accustomed.
- Provide restful and relaxing conditions at destination. Loss of stomach fill from transport can be partially, if not fully, regained under conditions that encourage eating.
- Be aware that animals that are not acclimated to the climate where they are delivered may need special care, such as protection from cold, or shading and ventilation to minimize effects of hot weather (see <u>Temperature</u>).

<u>Cattle</u>

- Provide cattle with good-quality hay after transport (see <u>footnote 5</u> for definition of good-quality hay). This makes them much more likely to drink and regain lost weight.
- Consider providing hay to cattle before water. Some experienced cattle transporters prefer this, because if cattle have immediate access to water, they may drink excessively and not eat. This is important during hot weather. However, do not withhold water for a prolonged period. The absolute maximum time water should be withheld is 2 to 3 hours.
- Rest cattle, if needed, after transport before they can eat and drink enough to fill their stomachs.
- Feed and water calves immediately upon arrival.
- Illuminate pens for arriving animals. Some experienced stockmen claim that cattle arriving late at night are slow to settle down and begin eating and drinking. This is probably because they are disoriented. Cattle and swine are not nocturnal animals.

Arriving cattle are unfamiliar with the layout of the pen area into which they are unloaded and do not know locations of feed and water dispensers.

<u>Swine</u>

- Feed swine lightly after transport. If they eat too heavily, they may become sick. They should be provided regular swine feed consisting of ground corn with a soy base. This feed can be pelletized or ground.
- Provide swine with water immediately after transport.

In Summary

Livestock highway transport is an important link in the export chain. What happens to animals on their way to a port or to their final destination after a voyage or a flight can make or break an export shipment. Paying close attention to the important aspects of livestock highway transport and how they influence the outcome of a shipment will enhance export sales.

- Preconditioning greatly affects how animals withstand the rigors of transport.
- Appropriate vehicle selection contributes to maintaining contentment of stock while on the road.
- Proper vehicle preparation helps to prevent injury and disease transmission during transport.
- Good loading techniques and appropriate stocking density help to prevent injury and minimize stress.
- Responsible care during transit helps to maintain health of stock.
- Proper unloading practices help to prevent injury and further stressing of already tired animals.
- Good post-transit care helps to assure successful highway shipment by preventing injury and helping stock to recover from the rigors of transport.

The recommendations on carrying out livestock highway shipment contained in this guideline are provided as tools for use in planning and implementing livestock highway shipments. When followed, they will help to maintain health of stock, assure humane treatment of animals, maintain market value, and reduce claims resulting from mortality and injury.

References

Ashby, B.H., and J.R. Langridge. Transporting Livestock Overseas by Air. ARS 52-38. U.S. Department of Agriculture, Agricultural Research Service, August 1970.

Asplund, J.M., H.F. Mayes, M.E. Anderson, G.L. Hahn, H.D. Hedrick, and T.G. Ebinger. Effects of Transportation, Handling, and Environment on Slaughter Cattle. Research Bulletin 1048, University of Missouri-Columbia, Columbia MO, September 1982.

Beef Housing and Equipment, Fourth Edition. MWPS - 6. Midwest Plan Service. Ames, IA, 1987.

Camp, T.H., D.G. Stevens, R.A. Stermer, and J.P. Anthony. Transit Factors Affecting Shrink, Shipping Fever, and Subsequent Performance of Feeder Calves. Journal of Animal Science, Vol. 52, No. 6, pp. 1219-1224, 1981.

Camp, T.H., R.A. Stermer, D.G. Stevens, and J.P. Anthony. Shrink of Feeder Calves as an Indicator of Incidence of Bovine Respiratory Disease and Time to Purchase Weight. Beef Cattle Research in Texas, pp. 109-112, Texas A&M University, July 1983.

Code of Recommendations and Minimum Standards for the Welfare of Animals Transported Within New Zealand. Ministry of Agriculture and Fisheries, Wellington, New Zealand, June 1993.

Eldridge, G.A., J.L. Barnet, R.D. Warner, W.J. Vowles, and C.G. Winfield. The Handling and Transport of Slaughter Cattle in Relation to Improving Efficiency, Meat Quality, and Animal Welfare. Research Report Series No. 19. Department of Agriculture and Rural Affairs, Animal Research Institute, Werribee, Victoria, Australia, July 1986.

Ensminger, M.E. Beef Cattle Science. The Interstate Printers and Publishers, Inc., 1968.

GOLDLINE. Merritt Equipment Company. Henderson, CO, 1989. (product brochure)

Grandin, T. Livestock Handling Guide. Livestock Conservation Institute, 1988.

Grandin, T. Understanding Animal Psychology Facilitates Handling Livestock. Veterinary Medicine Small Animal Clinician. pp. 697-706, May 1979.

Grandin, T., K. Ernst, D. Ernst, and J. McGlone. Handling Pigs. Livestock Conservation Institute, 1988.

Grandin, T. Livestock Trucking Guide. Livestock Conservation Institute, 1992.

Grandin, T. Livestock Handling and Transport. CAB International, Wallingford, Oxon, United Kingdom, 1993.

Grandin, T. Behavioral Principles of Livestock Handling. The Professional Animal Scientist, Vol. 5, No. 2, December 1989.

Handbook for the Preparation of Livestock for Transport. New South Wales Meat Industry Authority, Chatswood N.S.W. Australia (undated).

Harston, C.R. Cattle Shrinkage Depends on Where, When, and What You Market. Montana Agricultural Experiment Station, Circular 221, April 1959.

Harston, C.R. Cattle Shrinkage Depends on How You Market. Montana Agricultural Experiment Station, Circular 222, April 1959.

Hinds, R. H. and R.F. Guilfoy. Sprinkling Hogs in Trucks to Reduce Losses From Heat. Marketing Research Report No. 374. U.S. Department of Agriculture, Agricultural Marketing Service, Marketing Research Division, 1959.

Hutcheson, D.P., and N.A. Cole. Management of Transit-Stress Syndrome on Cattle: Nutritional and Environmental Effects. Journal of Animal Science, Vol. 62 (2) pp. 555-560, February 1986.

International Livestock Transportation Directory. U.S. Department of Agriculture, Office of Transportation, June 1982.

Livestock and Poultry: U.S. Trade and Prospects. U.S. Department of Agriculture, Foreign Agricultural Service. Dairy, Circular Series: FDLP 5-96, May 1996.

McKitrick, J.L. and J.W. McKitrick. Tips on Trucking Cattle. Hoards Dairyman, pp. 116-117, September 10, 1971.

Meat Animals - Production Disposition and Income 1995 Summary. U.S. Department of Agriculture, National Agricultural Statistics Service, Mt An 1-1 (96), April 1996.

Phillips, W.A., N.A. Cole, and D.P. Hutcheson. The Effect of Diet on the Amount of Weight Lost by Beef Steers During Transit or Fasting. Nutrition Reports International, Vol. 32 No. 4, pp. 765-776, October 1985.

Proper Handling Techniques for Non-ambulatory Animals. Livestock Conservation Institute, 1992.

Rickenbacker, J.E. Handling Conditions and Practices Causing Bruises in Cattle. Market Research Report No. 346, U.S. Department of Agriculture, Farmer Cooperative Service, 1959.

Seubert, T.V. Handling & Transport Of Bob Calves & Special Fed Veal Calves. Official Proceedings of the Livestock Conservation Institute 66th Annual Meeting, Louisville, KY, April 13, 1982.

Short Stacked Diesels Slice One Third Pound Off Gains. Beef, p. 7, February 1974.

St. Clair, J. S. and R.L. Kelley. Truck Transportation of Wyoming Livestock. University of Wyoming, Agricultural Experiment Station, Bulletin 395, August 1962.

Appendix A: Handling Downed Animals

Despite the best efforts of all involved in livestock transport, animals are sometimes injured so severely or become so ill that they are unable to stand. When this occurs, whoever is responsible for the animals must quickly decide how to handle the situation. Prompt action is essential. Inaction is inhumane. Humane treatment is the first priority whenever an animal becomes sick or injured. The following recommendations will help to determine the best course of action when an animal goes down.

Deciding How To Handle the Situation

- Determine as quickly as possible how to handle a downed animal. Some livestock transportation experts recommend calling a veterinarian to help determine if the animal should be treated or humanely destroyed.
- Decide whether to destroy an animal on the spot or transport it to a slaughter house. Which is best depends on availability of implements and/or drugs needed to destroy the animal, proximity of the slaughter house, and availability of transportation.
- Use a captive bolt stunner⁽¹¹⁾ or a firearm to destroy animals if drugs cannot be used. Shoot cattle in the center of the forehead and swine in the center of the forehead just above the eyes. The captive bolt stunner is safer to use because it does not fire a free bullet.
- Be aware that entering a truck loaded with cattle or other large stock to care for a downed animal can be dangerous. Animals may panic and trample handlers.
- Allow sick or injured animals to fully recover before transporting.

Helping Downed Animals To Get Up

- Help downed cattle to get up, if possible. If an animal is lying on its side, lift its head to the vertical position. If the animal's legs are underneath it, push up on its shoulders. These techniques will often enable an animal to get up. Several attempts to get the animal up should be made and the animal should be allowed to rest briefly between each attempt.
- Help unsteady cattle to walk. Holding an animal's tail will help it maintain its balance.

Handling Animals That Cannot Get Up

Use any of the following methods or combination of methods to handle downed animals:

- Gently roll downed animals to move them. Do not drag or lift animals by their limbs unless there is no other alternative. If the animal can be saved and there is no alternative to dragging, it should be dragged the minimum distance to where a more suitable moving method can be used.
- If the animal must be lifted by its limbs, use the uninjured limbs and place pads where any chains or cables will be attached.
- Do not drag animals by the neck. Use a rope around the animal's shoulders or pull it by uninjured limbs, if there is no other alternative.
- Use a heavy duty, two-wheeled cart made for moving boxes to move downed swine and other smaller livestock. The cart should be equipped with a large platform. Push the platform under the animal, and tilt the cart back to move the animal onto the platform. A second person should be available to steady the animal on the platform.
- Use a wide board or piece of conveyer belt to move downed livestock. When a conveyer belt is used, the end that is pulled should be reinforced with a metal strip to prevent buckling. Gently roll the animal onto the board or conveyer belt. The board or belt can then be carried or dragged. Once the animal is on the board or conveyer belt, it can be pulled by a tractor.
- Use a front-end loader to move downed animals in holding facilities. One person operates the loader and one or two others roll the animal into the bucket. Moving downed animals with a loader is easier and more humane if the standard bucket is replaced with a larger, specially designed bucket with a hinged lid that will prevent the animal from falling out.
- Use a forklift equipped with a platform, with the front edge angled down to facilitate rolling the animal. Bare forks should never be shoved under a downed animal. The platform can also be equipped with straps to prevent the animal from falling off.

Caution: Never push an animal against a wall or fence to get it into a loader bucket or onto a forklift platform.

- Consider using a frame on four wheels with slings that is manufactured especially for moving downed animals. It can fit into tight spaces and has large wheels that allow easy movement over rough surfaces.
- If a hoist is needed to load an animal onto a truck, be certain to use the appropriate size sling.
- Separate downed animals from other stock, if they must be carried on the same truck.

- Tie downed animals if they must be carried on a truck. The animals' movement during transport, especially involuntary movement, may cause unnecessary pain and further injury.
- Consider using a livestock trailer with side doors, as they greatly facilitate handling of downed animals. Cattle that go down in the belly compartment of a semi-trailer without side doors are very difficult to remove humanely. If it is not possible to move the animal onto a board or piece of conveyer belt and drag it out, humanely destroy the animal in the trailer.

Appendix B: Nationwide List of Rest Stops

The following animal transit rest stops are approved by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). There are other facilities (stockyards, etc.) throughout the United States that may be used to rest animals in transit. However, when exporting livestock, compliance with Federal regulation may require use of the following facilities.

Adair Cattle Feed and Rest Station

Route 1, Box 355 Adair, OK 74330

Contact for Arrangements: Don Eastin Phone: (918) 785-2386

Facility Manager: Jim D. Eastin Phone: (918) 785-2681, or (800) 754-1241

Kinds of Animals Accepted: All Species Livestock

Capacity of Facility: 400 cattle weighing 1,000-1,200 lb (454-544 kg) each

Number of Pens: 10 Indoor

Sizes of Pens: 20 by 52 ft (6.1 by 15.8 m)

Type of Loading and Unloading Facilities Available: Fixed concrete chute, 48-in (121.9-cm) high

Distance From Major Highways: Located on U.S. 69 at mile marker 199 on east side, or 7 mi (11.3 km) south of Big Cabin exit off Interstate 44

Cheyenne Stockyard

350 Southwest Drive Cheyenne, WY 82007

Facility Managers: Dr. Jay Dee Fox and Carol Franzen Phone: (307) 634-7333

Kinds of Animals Accepted: All Species Livestock

Capacity of Facility: 1,500 cattle weighing 1,000 lb (454 kg) each 3,000 swine weighing 200 lb (91 kg) each Number of Pens: 70 Indoor 8 Outdoor

Size of Pens: 20 by 40 ft (6.1 by 12.2 m)

Types of Loading and Unloading Facilities Available: Chutes for all types of livestock trucks

Distance From Major Highways: Located 1 mi (1.6 km) east of Interstate 25 on Lincoln Way

C&R Midwest Quarantine Station

35W090 Lathrop Lane Dundee, IL 60118

Facility Managers: Randy Lathrop and Peggy Lathrop Phone: (847) 428-5806 FAX: (847) 428-3788

Kinds of Animals Accepted: All Species Livestock

Capacity of Facility: 450 cattle weighing 1,200 lb (544 kg) each 600-700 swine weighing 250 lb (113 kg) each

Number of Horse or Bull Stalls: 50 Size of Stalls: 10 by 10 ft (3 by 3 m)

Number of Pens: 7 Indoor Pens 7 Outdoor Pens

Size of Pens: Varies from 20 by 40 ft to 44 by 80 ft (6.1 by 12.2 m to 13.4 by 24.4 m)

Type of Loading and Unloading Facilities Available: Chutes for all types of livestock trucks

Distance From Major Highways: Located on U.S. Route 31, 5 miles (8.0 km) from exit for U.S. 31, north on Interstate 90

KCI Export Facility 12600 NW Prairie View Road P.O. Box 20462 Kansas City International Airport Kansas City, MO 64195-0462

Facility Managers: Maria Bustamante Phone: (573) 751-4570 FAX: (573) 751-2868

Michael Webber Phone: (816) 243-3160 FAX: (816) 243-3171

Kinds of Animals Accepted: All Species Livestock

Capacity of Facility: 188 cattle weighing 1,000-1,500 lb (454-680 kg) each 1,050 swine weighing 100-150 lb (45-68 kg) each

Number of Pens: 22 Indoor

Size of Pens: Sixteen 10 by 10 ft (3.0 by 3.0 m) Four 20 by 15 ft (6.1 by 4.6 m) Two 8 by 9 ft (2.4 by 2.7 m)

Number of Pens: 32 Indoor Pen Size: 7,000 ft² (650.3 m²)

Type of Loading and Unloading Facilities Available: Two chutes for semi trailers

Distance From Major Highways: Airport highway and street system connects directly with Interstate 29, Interstate 435, and State Highway 291

Pennsylvania Holstein Association Farm

1806 River Road Middletown, PA 17057

Facility Manager: William Allen Phone: (717) 944-1374 FAX: (717) 944-2551

Kinds of Animals Accepted: Cattle

Capacity of Facility: 800 cattle weighing 1,000-1,100 lb (454-499 kg) each

Number of Pens: 16 Indoor

Size of Pens: 60 by 60 ft (18.3 by 18.3 m)

Type of Loading and Unloading Facilities Available: Chutes for all types of livestock trucks

Distance From Major Highways: 6 mi (9.7 km) from Interstate 81; 4 mi (6.4 km) from Pennsylvania Turnpike; 6 mi (9.7 km) from Interstate 83

Appendix C: Livestock Weather Safety Index

Livestock Weather Safety Index



Note: Centigrade temperatures were converted from Fahrenheit and rounded to the nearest whole number

How to Read This Chart

If the intersection of temperature and
humidity on the chart is in the <i>ALERT</i>
range, load 10 percent fewer hogs and
plan to deliver them to market by
11:00 AM.
If the index is in the DANGER zone,
load 20 percent fewer hogs and haul
them at night.
If the index is in the EMERGENCY
zone postpone hog shipments until the
weather moderates
() caller moderates.

¹. Excludes interfarm sales within States.

². Green and succulent feeds are fresh pasture, fresh hay, or fresh grain.

³. Concentrated feeds are high protein feeds consisting of corn and soybean meal, vitamin supplements, and little or no roughage.

⁴. High-energy feeds are high carbohydrate feeds consisting mainly of corn, milo, barley, or oats with 15% or less roughage.

^{5.} Good-quality hay is free from rot, mold, foreign material, and coarse stems.

^{6.} Grain-based feed consists of corn, milo, barley, or oats

⁷. Long hay is bailed from field, not chopped or pelletized

^{8.} See the following reference for detailed recommendations on water for livestock: National Research Council. Subcommittee on Nutrient and Toxic Elements in Water. Nutrients and Toxic Substances in Water for Livestock and Poultry: A Report. National Academy of Sciences, Washington, DC 1974.

⁹. Immersed in a chemical solution to control external parasites.

¹⁰. Federal law requires that livestock in interstate commerce be in transit for no more than 28 hours without food, water, and rest. However, this law applies only to rail shipments.

¹¹. A captive bolt stunner is a device that operates like a firearm and drives a cylindrical object out of a barrel for a limited distance. It is placed against an animals' head when it is to be fired.