A quality assurance program designed specifically for the transporters, producers and handlers of pigs.

Version 6 Handbook

National Pork Board
1776 NW 114th St, Clive IA 50325
pork.org | (800) 456-7675

©2016 National Pork Board, Des Moines, IA USA. This message funded by America's Pork Producers and the Pork Checkoff. #04924 11/16

pork.org | (800) 456-7675
Table of Contents

Introduction ........................................ 1
1. Pig Behavior ................................... 5
2. Handling .......................................... 10
3. Facilities & Equipment ......................... 23
4. Loading, Unloading & Transportation ....... 27
5. Fitness of the Pig ............................... 38
6. Biosecurity ...................................... 44
7. Emergency Response Plan ...................... 52
8. Laws, Regulations & Audits ................... 59
Appendix ............................................ 67

Introduction

Transport Quality Assurance - Building Trust for a Stronger Industry

In business, many trends come and go. But one constant that will never change is the need to earn the trust of your customers. For the pork industry, and all businesses involved in the food chain, earning and maintaining the trust of our customers - retail, foodservice and the consuming public - has never been more challenging. This fact, combined with our industry’s desire to conduct our business according to high ethical standards and best practices, led to the development and evolution of the Transport Quality Assurance (TQA™) program. Originally launched in 2002, TQA has undergone three revisions to provide the most current, science-based information on humane handling and transport of pigs to over 29,000 handlers and transporters in the industry. The TQA program helps pig transporters, producers and handlers define best practices for handling, moving and transporting pigs and the potential impacts those actions can have on pig well-being and/or pork quality.

We Care™: Making our Industry Stronger

There continues to be a growing interest among food-chain customers and the general public with the way food is produced. Pork industry leaders launched the We Care initiative recognizing these concerns must be addressed to better position the industry’s track record of responsibility. The We Care™ initiative seeks ongoing improvement in the pork industry’s production practices, building upon and promoting to those outside the industry its strong record of responsible farming. TQA is a critical component of the We Care initiative and is a clear demonstration of the industry’s commitment to responsible farming and continuous improvement. At the heart of this commitment is a statement of ethical principles that asks each and every member of the pork industry to commit to:

• Produce safe food
• Protect and promote animal well-being – including proper handling and transport at all phases of production
• Ensure practices to protect public health
• Safeguard natural resources in all of our practices
• Provide a work environment that is safe and consistent with our other ethical principles
• Contribute to a better quality of life in our communities
The Right Thing to Do. For Your Business. For Your Industry.

TQA is a clear demonstration of how the pork industry promotes and implements responsible practices when handling and transporting pigs. Not as a result of regulation or mandate, but rather as an acknowledgment that adhering to good production practices is a good business decision and is the right thing to do. The spirit of continuous improvement - always striving to do better - is a mindset that has long been embraced by pork industry stakeholders. When the industry is responsible and proactive, every stakeholder - including pig handlers and transporters - benefits. Producer leadership urges all those involved in the movement and transport of pigs to recognize that we all share a duty to demonstrate responsible pork industry practices. Full participation in the TQA program and implementation of the recommendations are critical to building our customer trust while continuing to enhance the integrity of the pork industry.

The Role of Handlers and Transporters

Pig handlers and transporters play a key role in the pork production process. Handling and transporting the pigs in our care are essential elements to the multi-site pork production model that is used in the United States today. The pork production system involves not only moving animals from the farm to the market or harvest facilities, but it also involves handling and moving an animal several times throughout the production cycle. Animals are often moved and handled for purposes of:

- Routine daily care
- Treatment of an illness or injury
- Reproduction
- Relocation to another production phase and location/site
- Marketing
The figure at the bottom of page 2 illustrates the animal-flow through a typical pork production system. Each arrow in the illustration is a point where pig/handler interactions can occur through handling and transportation.

No matter what segment of the pork production system, the actions of a handler or transporter can have a significant impact on pig well-being, health, biosecurity and pork quality.

Animal Well-Being

The conditions under which pigs are handled and transported can have a direct impact on their well-being. Research has shown that using good animal handling practices benefits the pig, the handler and the industry. For the pig, good animal handling can result in the reduction or elimination of stressful experiences and therefore improves animal well-being. For the handler, good animal handling generally results in easier pig movement, which means better well-being and less frustration for the animal handler. Other benefits to the animal handler include a decrease in transport losses, reduced time to load and unload pigs, reduced weight loss and better meat quality. Good animal handling helps meet USDA humane handling regulations. Becoming a TQA Certified Handler demonstrates your commitment to promote and protect pig well-being to our customers and consumers. Incidents of poor animal handling or abuse are ethically wrong and unacceptable. It is important to remember that an individual’s actions, both positive and negative, can have a direct impact upon themselves, the company they represent and the entire U.S. pork industry.

Animal Health and Biosecurity

Healthy animals are essential to a successful pork production operation and are better able to fully express their lean genetic potential. Diseases can be introduced into herds through the loading and transportation processes and through the introduction of new pigs into the herd.

Preventing disease movement and introduction makes it imperative that handlers, both in production facilities and those driving trucks follow biosecurity protocols to minimize the spread of disease agents and to ensure the health of the animals they interact with.

Pork Quality

Improper handling and transport of pigs is one of the largest profit-reducing issues facing the pork industry today. Most losses typically result from the events immediately before, during and after transport of the pigs. Evidence of improper handling and/or transport can be seen through:

- Carcass losses resulting from trimming off bruises
- Pale, soft and exudative meat (PSE)
- Dark, firm and dry meat (DFD)

Estimates show that bruises alone can cost the U.S. pork industry millions of dollars per year. Overall pork quality defects total several hundred million dollars annually.
**Expectations of TQA Certified Handlers**

TQA Certified Handlers are expected to uphold the ethical principles of We Care every day. Whether handling pigs on the farm or transporting them, TQA Certified Handlers have a responsibility to:

- Protect food safety
- Protect and promote pig well-being
- Protect public health
- Safeguard natural resources
- Promote a safe work environment
- Contribute to the communities in which we live and operate

**Summary**

- Good handling and good transport experiences for pigs are a part of demonstrating the six ethical principles of U.S. pork producers.

- Movement of pigs occurs during all phases of production. Good animal care and proper handling should occur throughout all phases.

- How pigs are moved impacts meat quality and the value of the pig at the packing plant. Good handling is right for the pig and increases profitability for all phases of production.

- From the animal handler, to the transporter, to the packer, we all have responsibility to be good stewards of the pigs in our care. The TQA program delivers you the knowledge to be an expert at providing the best care to pigs when they are transported and gives our customers the assurance that people who move pigs know what they are doing and are doing the right thing every day.
1. Pig Behavior

Understanding basic pig behavior and body language will help contribute to a safe and positive experience for the pigs and the handler.

**Basic Pig Behavior**

Good animal handling practices start with the handler having a good understanding of pig behavior. A significant portion of a pig’s behavior can be attributed to natural instinct and is further impacted by the age, gender, health status, environment and previous experiences of the pig. Understanding a pig’s basic behavior can help:

- Facilitate animal handling
- Reduce stress
- Reduce risks to a handler’s personal safety
- Reduce losses due to skin injuries, bruises, fatigue and even death

Calm pigs are easier to handle than excited, agitated pigs. Handling will be easier and pigs will be less likely to become agitated and bunch together if handlers use basic behavioral principles. An important part of effectively using pig behavior during handling procedures is learning how the pig perceives and responds to the handler in different situations and environments. There are three basic characteristics of the individual pig to consider:

- Flight Zone
- Point of Balance
- Senses – sight, hearing, smell, touch, and herd behavior

The **flight zone** is the area around an animal that it considers its individual space. Pigs try to maintain a safe distance between themselves and their handlers. Many pig handling activities occur in crowded or confined conditions that don’t allow pigs to maintain a safe distance from their handlers. The safe distance varies between pigs, from moment to moment for each pig, and with even minor changes in handler behavior and body language. The more threatening we are the greater the distance pigs want to keep from us. When pigs can’t maintain a safe distance from their handlers they get scared or defensive and their body language and behavior change. Handlers need to recognize cues that pigs are getting scared, understand how pigs’ responses change when they are scared or confined, and modify their actions to keep pigs clam and get the pig responses they need.

The pig uses its **point of balance** to determine which way to move away from the handler as long as the pig has space to move away and the handler allows it to move away. Typically, the point of balance is located at a pig’s shoulder but this may change depending on the environment. There are many conditions where the point of balance will not accurately predict how a pig will respond. There are situations where best results are achieved by working ahead of pigs and letting them circle past, for example, as they move out a gate. A common error handlers may make is attempting to move the pig forward while standing in front of the pig and tapping it on the rear or pressuring it to move forward. Also, handlers should not move, block or interfere from a forward position when another handler is attempting to move pigs past them. Pigs may balk and refuse to move if they are driven towards visible people.

A pig relies on its **sense of hearing and smell** to situate itself in its surroundings and uses sight to complement information gathered by these two senses. The blind spot exists because a pig’s eyes are on the sides of its head and a pig’s field of vision is approximately 310 degrees, leaving a blind spot directly behind it. Pigs want to see anything that is a
potential threat or source of pressure. They try to keep handlers out of their blind spots. When that isn’t possible, pigs use their hearing to track people they can’t see. We have to notice what pigs are watching or listening to in order to move them effectively. A pig’s sense of touch also plays an important role during handling.

The figure at left shows the flight zone, point of balance and blind spot of an individual pig. This diagram illustrates a very specific set of conditions that are not always commonly found in barns or transport trailers. When pigs are moving up a loading ramp, the point of balance will be at the shoulder but the flight zone should still be observed so the pig is not crowded and can get release from handler pressure. Close contact with other pigs and repeated contact by a handler or handling tools encourage pigs to stop moving.

The point of balance shown in the diagram is especially useful when moving a single animal such as a sow. A common mistake is to stand in front of the sow and tap her rear. A handler moving a sow should move behind the point of balance.

When pigs are flowing freely and following each other, the natural following behavior overrides the point of balance behavior. In this situation, a group of pigs following the leader will move easily past a handler who is in front of the point of balance showing in the diagram.

Handlers inside barns and trailers typically work in conditions that are very different from those specified in the diagram:

- Groups instead of individual pigs
- No chute to prevent pigs from turning around
- Confined spaces, such as pens and alleyways, that require handlers to work inside pigs’ flight zones and that limit pigs’ ability to move away from them
- Other people involved during loading and unloading of pigs

Changing any of these conditions changes how pigs respond to us. When working with groups of pigs in confined spaces and when additional people are present, the pigs’ ability to move away from handlers is restricted. We can no longer depend on the point of balance and automatically assume that pigs will move away from handler pressure to their flight zone. Instead, we need to understand how pigs’ behavior is influenced by their:

- fear levels
- herd behavior
- the presence of additional people
- handlers’ use of pig handling tools
- environmental influences

Each factor influences pig behavior independently and in combination with the others.
Pig Body Language

Pigs tell us what they are paying attention to with their body language, heads, eyes and ears. Specifically, handlers should note where pigs are looking, how they are bending or twisting their bodies, how pigs have their heads and ears turned or cocked, and whether pigs are listening intently. Pigs track their handlers more closely as handlers become more threatening, as pigs become more scared, or as the space they are worked in becomes more confined. In confined spaces or when pigs are scared, a handler’s pressure tends to hold pigs’ attention rather than drive pigs away. Pig body language changes as they go from calm to scared to highly excited. A good animal handler can read the pigs’ body language and adjust their own actions accordingly.

Releasing pressure refers to any action that reduces the level of threat we pose to the pig. It often involves giving pigs more time and space. Some ways to release pressure are to:

- Pause and let pigs move away
- Step back and refrain from making physical contact with pigs
- Soften our body language to reduce both our threat and the distance pigs require
- Let pigs circle past us: our strongest pressure is in the direction we are facing
- Discontinue making noise
- Look away from pigs
- Reduce group size – this is dependent on several factors such as pig size, aisle, door or chute width, environmental influences

Pigs communicate their level of fear with their heads, eyes, ears, vocalization and body movements. Signs of increasing fear when we are moving pigs:

Pigs that are calm:

- Able to stay a safe distance from the handler and get release from handler's pressure
- Head and ears low, body relaxed
- Moving at a walk or trot, (or exuberant outbursts if excited but not scared)
- Attention not strongly focused on the handler
- Any vocalizations are low pitched

Pigs showing mild fear or defensiveness:

- Handler is getting too close / not giving enough release from pressure
- Heads and ears rising
- Still moving away but with increasing attention towards the handler
- Flight zone is expanding
- Possible brief increase in speed
- If you release pressure the animal will calm down
- If you maintain or increase pressure, the animal may become more fearful or defensive
**Pigs showing heightened fear or defensiveness:**

- Handler is too close / using too much pressure and animal is unable to get release
- Full attention is on the handler
- Pig’s efforts to move away aren’t working so it switches to alternative tactics: stop, back up, turn back, and try to get past the handler, bunch or...
- Shut down and refuse to move – a defensive response different from being too tame or fatigued
- If you release pressure the animal will calm down but may require some time to do so
- If you maintain or increase pressure, it may escalate to extreme fear
- Strong tendency to circle or bunch up and difficult to sort, separate or control
- High pitched vocalizing

**Pigs showing extreme fear or defensiveness:**

- Panic
- Willing to run under, over, or through handlers and obstacles
- Scrambling, out of control movement
- Refusal to move
- High pitched vocalization
- Possible severe stress symptoms including death
- Very strong circling or bunching up and difficult to sort, separate or control

**Herd Behavior and Group Patterns:**

Pigs try to stay with other pigs for protection. Anytime we work with groups of pigs we get some form of herd behavior. Flowing herd behavior encourages pigs to move; bunching herd behaviors discourages pig movement. The manner in which pigs display herd behavior is closely linked to their fear levels, what they are paying attention to, and available space. When moving pigs, handlers should encourage flowing herd behavior and minimize bunching herd behavior.

**Flowing Herd Behavior:** Movement occurs when pigs move with a moving group. Flowing herd behavior gives us our best possible movement. This flowing movement occurs when:

- There is a calm pig response.
- Pigs are drawn to the movement of other pigs.
- Pigs’ attention is on moving and staying with the herd.
- Movement of front animals draws other pigs to join and follow.
- Movement of animals coming behind drives front animals to continue moving forward.
- Animals are loosely spaced and not touching each other.
- The handler is moving with and not forcing the flow. Pigs are being given time and space to clear obstructions, corners, etc. and move out of their space before the handler moves into it.
- Pigs feel safe shifting their attention away from the handler to follow the herd.
**Disrupting flow:** Movement and distractions ahead or to the side of the pigs can catch their attention and stop flow. More importantly, excessive handler noise, pressure and crowding from behind will also stop movement. Pigs may slow or hesitate when they encounter something new or unfamiliar such as changes in:

- Floor surface (e.g., transition from concrete alley to wooden chute)
- Footing/traction (e.g., wet, slippery chute or loose cleats)
- Temperature (e.g., moving from a warm building to an outdoor chute/ramp on a cold day)
- Lighting – pigs move best from dark areas to lighter areas, not from light to dark

If the lead animals are given enough time to move through the transition, other pigs will follow. When handlers anticipate problems and increase noise, pressure and crowding to try to scare and force animals through transitions, they cause the balking and piling they hope to avoid.

The same can occur with other things that may be unfamiliar or distracting and cause pig flow to slow or stop:

- People in their path or peripheral vision area
- Drafts or wind – pigs may refuse to walk into a draft that blows into their face
- Shadows
- A beam of light shining through a crack or opening
- Equipment, trash or other objects in their path or hanging on gating (e.g., feed cart in alley)
- Loud or sudden noises and activity where they can hear but not see the source
- Water puddles or drain grates
- Shiny/reflective objects or surfaces
- Change in color of equipment/gates
- Change in height of flooring, a step up into a pen or chute, etc.
- Moving or flapping objects
- Doorways that may change the width of the alley
- Other animals (e.g., pigs, dogs, cats)

Items on this list cause problems for some handlers but not for others. Handlers who read their pigs, keep them calm, and give them time and space to flow tend to experience fewer difficulties. Take the time to minimize distractions in the environment before moving pigs and pay attention to what pigs are telling you. Signs of increasing fear indicate the handler needs to release pressure so pigs can stay calm and continue flowing.

**Flowing Herd Behavior as it Relates to Transport**

Most handlers have experienced frustration while unloading because someone outside the trailer is receiving, counting, auditing, tattooing, moving pigs, or doing other things that block pigs from moving off the trailer. When pigs are being loaded onto a trailer, the transporter is the receiver. People bringing pigs to the trailer get annoyed when they see a face looking back or hands and tools in sight, moving around, reaching in, making noise, and stopping their pigs. The most helpful thing a transporter can do to speed up loading is to stay still, stay quiet, and stay out of sight until the last pig in the group gets past.
It is important that only one person pressure pigs at any time. When someone is behind a group of pigs driving them towards you, anything you do could encourage the pigs to stop and turn back. Pigs have to be moving to get to the trailer and our best tool is to let that flow keep moving them into the trailer. Any noise or activity from the handler risks:

- Drawing attention and stopping pigs that have already gone past
- Blocking pigs that are approaching so they stop moving and stop driving the front pigs forward
- More forceful handling from an annoyed loader, and that in turn leading to more problems and longer load time

Pigs try to keep track of all people. Observers and people not actively involved with moving pigs can also draw pigs’ attention and stop movement. The fewer people present, the simpler it is for pigs to keep moving and the easier it is for the people moving them.

**Bunching Herd Behavior:** This occurs when pigs stay still and stay with the group when the group is stopped. Bunching:

- Is a defensive response
  - Occurs when pigs are crowded close together
  - Occurs when pigs are unable or unwilling to move to get a handler out of their flight zone
- Not only stops movement, but discourages pigs from resuming movement which may be useful for ear tagging and vaccinating
- Is encouraged by anything that stops, crowds, scares, traps or confuses pigs
- Often occurs with pigs facing away from the handler, closely packed, and listening intently

Pigs require release of pressure to come out of a bunch or pressure ahead to turn them out of a bunch.

Early warnings of heads and ears rising and increased crowding within the group indicate the need to give pigs more space and time. Pigs will often find it safer to stay in a bunch rather than leave the bunch to get away from the handler. Increasing pressure and aggressiveness towards pigs that are bunching encourages tighter bunching. One of our main priorities when moving pigs is to avoid having pigs bunch.

**Handler’s bubble:** We can look at the safe distance pigs try to maintain between themselves and a handler as either a flight zone around the pig or as a bubble around the handler. When space is available, the bubble:

- Takes up “real” space and contributes to crowding
- Expands and contracts as the handler’s pressure and pigs’ fear levels change
- Can act as a “real” barrier that moves with the handler

It is important to note, in confined spaces, pigs may be inside the handler’s bubble at all times. Pigs tend to move along the arc of the bubble. By watching where the bubble is taking pigs, handlers can adjust their position so their bubble takes pigs where they want them to move. In crowded conditions, such as when starting movement out of rear compartments, all pigs will be trapped inside the handler’s bubble. Smaller pigs will tend to pile away to get out of the bubble then turn back to circle the handler. Larger animals such as market pigs and breeding stock are more likely to hold still and show bunching...
herd behavior within the bubble. With larger animals, you want to start animals that are facing the right direction and use their movement to pull others.

**Circling:** When pigs can’t move to get away from a handler, they will either bunch together and stop moving or circle their handlers to get release from pressure. Circling is a defensive response. Circling is a valuable tool when used intentionally in conjunction with the handler’s bubble to sort pigs, start movement, speed up movement, shift pigs’ attention from the handler to herd flow, move pigs past barriers, and funnel movement to prevent stopping and bunching at gates.

**Taking stock:** Pigs are predictable and easiest to control when they are calm. The confined spaces of pens, alleyways, and trailers, and unfamiliar activities like sorting and loading can make pigs defensive and increase their tendency to either circle or bunch. Aggressive handling intensifies these responses and makes pigs harder to move, separate or control.

Instead of using fear to make pigs move:

- Use the least amount of pressure necessary to start movement then give release to:
  - let pigs stay calm
  - allow pigs to shift their attention away from you so they can move away from you or join the movement of other pigs
- Use herd movement to pull pigs whenever you can.
- Use your position and bubble to prevent bunching herd behavior and encourage flow.

When pigs turn back, balk, refuse to move, and try to get past the handler they are not displaying defiance, excessive tameness, or ignorance. These are fear responses triggered by handlers who are not giving the pigs the time and space they need to respond safely. Many pig handling problems attributed to environmental factors are actually caused by handlers working too aggressively.

**Summary**

Using proven pig handling and movement practices will help contribute to a safe and positive experience for the pigs and the handler:

- Understand basic pig behavior to facilitate animal handling, reduce stress, reduce risks to a handler’s personal safety, and reduce pork loss due to skin injuries, bruises, fatigue, and even pig death.
- Take time to minimize distractions in the environment before moving pigs.
2. Handling

Using proven pig handling and movement practices will help contribute to a safe and positive experience for the pigs and the handler. Human injuries happen more often when people are handling animals than during any other activity performed in pork production. Common handler injuries when moving pigs are contact injuries, slipping and falling, head cuts, or bumps and bruises when on the trailer. Using proper handling practices and using proper handling equipment will help animal handling be a safe activity for all.

People: Pig Interactions

It is important to understand the potential effects that human interactions have on pigs and pig behavior. A person’s intentions are not always understood by the pig and this may create fear and/or a negative reaction to a handler. Additionally, pigs that have had regular, positive interactions with people will typically be less fearful and easier to handle. Slowly walking pens on a daily basis will help pigs become used to positive interactions with people. This will train the pigs to quietly get up and calmly move away from the handler. Pigs can recall previous experiences and if they have had a bad handling experience in the past they may be more difficult to handle the next time. This previous experience may relate specifically to a human interaction or it may relate to a piece of equipment such as a loading chute.

Handlers should act calmly and avoid sudden movement, loud noises and other actions that may frighten or excite pigs. This includes shouting or creating excessive noise with other handlers when working as a team to move pigs.

Pigs should be moved at their normal walking pace. Aggressive handling should be avoided as it can lead to injured or stressed pigs. Research indicates that more than 20 percent of aggressively-handled market pigs can become injured, stressed or fatigued compared to 0 percent of those handled properly.

Aggressive handling includes things such as:

- Overuse, or improper use, of electric prods and other handling tools
- Loud noises and yelling
- Moving pigs too fast
- Moving too many pigs per group
- Overcrowding pigs in chutes, ramps and alleyways
- Rough physical contact
**Willful acts of neglect or abuse are unacceptable.** Each state has laws that address animal cruelty, and therefore willful acts of abuse can be punishable by law. Willful acts of abuse or neglect are defined as acts outside of normally accepted production practices that intentionally cause pain and suffering including, but not limited to:

- Intentionally applying prods to sensitive parts of the animal such as the eyes, ears, nose, genitals or rectum.
- Malicious hitting/beating of an animal. This includes forcefully striking an animal with closed fist, foot, handling equipment (e.g. sorting board, rattle paddle, etc.), or other hard/solid objects that can cause pain, bruising or injury.
- Driving pigs off high ledges, platforms or steps while moving, loading or unloading (animals are falling to the ground).
- Dragging of conscious animals by any part of their body except in the rare case where a non-ambulatory animal must be moved from a life threatening situation. Non-ambulatory pigs may be moved by using a drag mat.
- Purposefully dropping or throwing animals.
- Causing physical damage to the snout or tusks of a boar as a means to reduce aggression (this excludes nose ringing and tusk trimming).

The National Pork Board strongly encourages anyone with knowledge of possible animal abuse or neglect to report these actions immediately to the proper responsible persons. If a willful act of abuse is observed, immediately intervene to stop the situation if reasonably and safely possible. Discuss the situation with the appropriate authority (owner, manager, receiving crew, etc.).

Companies have animal-welfare policies that clearly define how these situations are to be handled and reported. Transporters and handlers should be familiar with these policies as well as auditing criteria, which includes routine monitoring of transporter behavior. Committing willful acts of abuse or failure to report witnessing a willful act of abuse may be grounds for termination of employment, may prohibit handlers from returning to a facility, or possible criminal penalties.

**Handling Pigs of Various Types and Sizes**

Basic handling protocols apply to nearly all pigs but requirements for certain sizes and types of pigs differ and specific techniques may need to be used.

**Handling BREEDING STOCK**

Breeding stock (sows, gilts and boars) are the largest and most powerful pigs a handler will work with and handlers should use extra caution when moving these animals. A sorting board should be used when moving a large animal. The handler should not use his or her body alone. If the animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk potential injury.

Additionally, breeding stock are the most unpredictable animals, especially boars. Boars are particularly unpredictable when exhibiting mating behaviors, such as when they are being used for estrus detection. **Boars are especially dangerous because their tusks can cause injury. So handlers should use extra caution and never turn their back to a boar.**
Sows can be aggressive as well, especially when they perceive their litter is being threatened (e.g., such as during piglet processing or weaning). In addition to their reproductive behaviors, pigs of breeding age require extra caution just because of their sheer body mass. Therefore, it is important for these pigs to be familiar with positive human interactions.

The ability to move breeding females and boars in and out of pens and/or individual housing units can vary greatly between handlers. In crowded spaces, these larger animals are likely to hold still rather than surge out of a handler’s bubble unless they are totally panicked. Handlers who have problems moving breeding stock tend to work too close and use continuous, urgent contact. To aid movement of breeding stock, handlers should give them space, move as groups when feasible, and minimize contact, noise, people, and other activity. There are many techniques that can be used based on what is known about pig behavior. For example, when trying to move a single sow into a farrowing stall she may resist because she sees her path is blocked by the stall end being closed. This may be overcome by leaving the stall door open and having someone close it when she enters the stall, but before she can move out the far end. The handler at the front of the stall should stand still and step away if the sow stops and looks at them as they are blocking her path. The handler behind the sow must respect her space and let her move.

These large animals also can cause injury, to people or pigs, through sudden movement of their heads or by pinning the handler between the pig and a fixed object such as a gate or feeder. Often this type of injury is a result of the handler’s arm or leg being in the wrong place at the wrong time. An example may be a crushing or pinching injury to a hand or foot when a pig closes a gate with its body.

**Handling PIGLETS**

Handling piglets can present a safety challenge to the handler. Piglets have sharp teeth and can bite the handler when they are picked up. The sow may also attempt to bite the handler when he or she reaches into the stall to grab a piglet.

Piglets can either be moved by herding or by picking them up and moving them by hand or with a cart. Piglets should be picked up by holding under the rib cage or by grabbing a rear leg, above the hock, and then gently setting the piglets into a cart, alleyway, or pen. Before releasing a pig to the ground the pig should have two points of contact before the handler lets go (i.e., both front legs) Piglets may squirm and wiggle when picked up so care should be used so that they are not dropped. **Piglets should not be tossed or thrown.** When being held for an extended period of time, piglets should be held under the rib cage next to the handler’s body or by both rear legs using two hands.

**Handling NURSERY AND FINISHER PIGS**

Nursery and finisher pigs grow rapidly and quickly become too large to lift and/or hold. When moving nursery and finisher pigs, our primary tool needs to be the effective use of pigs’ natural behavior and movement patterns as outlined in Chapter 1. By working with these patterns we make it easier for pigs to leave their pens and keep moving. We reduce the incidence of aggressive or agitated pigs and the safety risk they pose to handlers and themselves. That said, when an animal does get excited it may be safest for the handler to move out of the way to avoid potential injury and to let the pig calm down. Sometimes 20 to 30 minutes are required to allow pigs to calm down and become easier to move.
We often move nursery and finisher pigs out of full pens where restricted space encourages them to circle around the handler or stop and bunch, and through narrower gates that don’t allow all animals to exit at once. Getting behind and chasing pigs towards the gate encourages them to stop, crowd and bunch at the gate or circle away from the gate. By working at the side of the pen we can encourage pigs to circle towards the gate, funnel the flow and prevent pigs from stopping and bunching.

When sorting and moving these pigs, it is often the best practice to work in pairs and have one person work the pen gate while the other brings pigs to the gate for sorting. This is especially true when finished pigs are being sorted for load-out as the first pigs may be reluctant to leave their pen mates. When emptying entire pens, work along the side of the pen on the inside of the arc you want pigs to follow, and use your bubble to narrow the flow so pigs keep moving when they arrive at the gate. The most effective position will be closer to the gate than many people feel comfortable with. If there is more than one handler, both work along the side of the pen instead of behind the pigs and only one person applies pressure at any time. Always pay attention to where your position and bubble are taking pigs and adjust as needed.

When sorting individual pigs from a pen, start with pigs closest to gate and get as many selected pigs as possible to circle past you out of the pen before going deeper. Once in the pen it is important to give pigs release so they can move away from you. If you are working alone, pigs will stay calmer and easier to move and sort if you give them space and don’t try to corral or contain them until you have to open the gate. If you are working with a partner, it is important that only one person is active at any time. The handler at the gate can hold still while the other handler moves the pig forward, or the handler in the pen can hold still while the handler at the gate invites the chosen pig to circle out of the pen. If both handlers move at the same time they will encourage pigs to circle away from the gate. Once pigs are moving beyond the pen, minimize noise and contact, give them space and keep them calm to encourage flowing herd behavior and reduce the incidence of animals stopping or coming back at you.

Handlers should rely on a sorting board instead of their bodies to turn or stop large finishing pigs. To stop and turn a pig, instead of trying to hold your ground, give it lots of space and back up with your sorting board in front of you until the pig slows, stops, and turns. A bi-fold panel is a particularly useful device as it creates a coralling effect, reduces an escape route for the pig and increases safety for the handler. If an animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk a potential injury.

When working with larger pigs it is important for the handler to move in the pen with their legs slightly bent. If you stand in a pen with your legs locked you are at greater risk for leg sprains and strains if a pig runs into your knee. Instead, standing with knees slightly bent with a sorting board offers a buffer for your knees if a pig makes contact with your sort board and legs.
**Suggested Group Sizes**

Pigs should be moved in groups large enough to be efficient for the production system, but small enough to be safe for the pigs and the handler(s). Groups of finished pigs and breeding stock should be small enough so that the handler can maintain control of all of the pigs in the group so handling interventions can be applied to the pigs not moving. The handler should always remember that using too much pressure or crowding the rear pigs can stop the movement of the front pigs. Attempting to load a truck on the farm with a group size that is too large is a common cause of rough handling.

The suggested group sizes are based on best industry practice but facility design and conditions of the environment and/or animals may require adjustment to group size. There may be specially designed trailers or unloading facilities that allow for larger group size during the unloading process. Check with receiving personnel to determine the best group size for the situation and receiving facilities.

<table>
<thead>
<tr>
<th>Pig type/size</th>
<th>Suggested group size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weaned piglets</td>
<td>20</td>
</tr>
<tr>
<td>Nursery pigs</td>
<td>20</td>
</tr>
<tr>
<td>Finished/Market pigs</td>
<td>3-5</td>
</tr>
<tr>
<td>Sows/Gilts</td>
<td>1-5*</td>
</tr>
<tr>
<td>Boars</td>
<td>1-5*</td>
</tr>
</tbody>
</table>

*Depending upon temperament and safety conditions, may require moving individually.

When a farm moved 8 pigs in a group vs. 4 pigs in a group to the truck, it took longer to load the truck when they moved groups of 8 pigs. Research shows that moving 4 vs. 8 pigs reduces losses due to dead at arrival and non-ambulatory pigs by half.\(^{11}\) Moving pigs in groups of 5 resulted in lower heart rates compared to large groups.\(^{12}\) Group sizes must be appropriate for the smallest point in the path of movement. There are certain circumstances where the best herd size is 5 and others where 3 is better. Try different sizes in particular spaces until you find the number that yields calm, consistent movement. Smaller herd groups stay at a steady pace, which ultimately leads to a faster load time. Getting this number correct protects the pig and protects you.

---

**Figure 1:** Effects of group size during loading on loading time.*

<table>
<thead>
<tr>
<th>Loading time, min.</th>
<th>Groups of 4</th>
<th>Groups of 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>21.3</td>
<td>25.9</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.01

*Refers to the amount of time required to load a trailer deck (n=87 pigs)

**Figure 2.** Effects of group size during loading on non-ambulatory pigs at the farm.

<table>
<thead>
<tr>
<th>Non-ambulatory pigs, %</th>
<th>Groups of 4</th>
<th>Groups of 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05

**Figure 3.** Effects of group size during loading on DOAs and nonambulatory pigs at the plant.

<table>
<thead>
<tr>
<th>DOAs and nonambulatory pigs, %</th>
<th>Groups of 4</th>
<th>Groups of 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.01
Handling Tools/Equipment

There are many different pieces of handling and sorting equipment on the market, or that can be easily made on the farm, that are intended to help you sort or move pigs in a safe, humane and efficient manner.

Handling equipment is typically used to provide barriers or stimuli including:

- Physical barrier (e.g. sorting board or bi-fold)
- Visual barrier (e.g. matador's cape)
- Auditory stimulus (e.g. rattle/shaker paddle)
- Visual stimulus (e.g. nylon flag)

Most of these tools are effective for a specific situation and should not be used for others. For example, a plastic rattle/shaker paddle may be effective for moving weaned piglets from the farrowing room to the nursery, but is not a tool to use when moving a boar to his pen after he completes a round of estrus detection.

A common mistake is to ignore pigs’ flight zones when using handling tools. If you are close enough to touch a pig with your hand or other tools, you are likely in its flight zone and close enough to risk stopping movement. Hand-held tools are only helpful when used in harmony with the pigs’ natural behavior and response patterns outlined in Chapter 1. All tools require effective handler positioning and allow for pigs to get release from pressure. Minimal and thoughtful use of tools generates the most positive results. If pigs are moving, leave them alone; don’t touch them, just follow along and let them move.

To move pigs effectively, handlers must manage the pigs’ fear levels, herd behavior, and attention. Handlers manage those pig responses by managing their own position and their application and release of pressure to the pigs. Hand-held devices are only useful when they complement pigs’ natural behavior.

Electric Prods

A farm may choose to load pigs without use of electrical prods. When other handling tools are used properly, they can be as or more effective than electrical prods. Handlers are encouraged to consider the use of an electric prod as a last resort handling tool. Before using an electrical prod, the following should be tried:

- Calmly direct pigs using sort boards or bi-folds in groups of 3 to 5 pigs
- Use the pig’s field of vision and flight zone to encourage forward movement
- Gently tap pigs with your hand or shaker paddle
- Make an intermittent noise with your voice or with a rattle

If electrical prods are used:

- Tap pig with the wand without energizing the prod (realize any use of electric prods in most packing plants is not tolerated);
- Never use an electric prod in a pen when moving pigs toward an alleyway. This is unnecessary because we have many other tools that more effectively maneuver pigs in the pen such as sort boards.
- Never prod a pig in a sensitive area including eyes, ears, nose, genitals or rectum.
• If it is necessary to use a prod, the most effective area on a pig to create forward movement with an electrical prod (or paddle) is on the back of the animal, behind the shoulders and in front of the tail.\textsuperscript{15} If you prod the pig in front of the point of balance, the pig will move backwards.

• **Duration of the electrical stimulation should not exceed 1 sec.**

• Count to 5 before administering any additional taps or electrical stimulation.

• The pig should be allowed time to respond before additional prodding is applied. If the pig has been electrically prodded twice, STOP.

Use of electric prod elevates stress levels in pigs more than other forms of moving pigs. **Research shows that even minimal electric prod use changes blood lactic acid levels and also impacts meat quality, which in turn can increase fatigued and non-ambulatory pigs.**\textsuperscript{10, 16} Please refer to page 39 of Chapter 5 for the physiological differences between pigs handled gently (moving pigs at a slow and calm pace with a plastic cane) and aggressively (moving pigs rapidly with electric prods).

![Impact of Aggressive Handling on Incidence of Pigs Becoming Non-Ambulatory.\textsuperscript{17}](image)

<table>
<thead>
<tr>
<th>% of pigs showing signs of stress</th>
<th>Gentle</th>
<th>Aggressive – No Electric Prod</th>
<th>Aggressive With Electric Prod</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>15%</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>

Electric prod use may be appropriate to encourage forward movement of pigs. In this circumstance, when energized, the lead pig being prodded typically moves forward and out. Realize the pigs behind the lead pig will either follow or may jump backwards due to the sudden movement of the pig just before him. If the pig moves back, this is where the handler must be careful that his choice to electrically prod a pig once doesn’t turn into the primary persuasion tool for all pigs in the group. Allow time for the group to feel the relief of pressure by the lead pig moving forward. Allow the pigs time to see the lead pig move forward unharmed. Most importantly, figure out how to prevent bunching or piling of pigs at that location in the future. Is it lighting? Is there wind in the faces of the pigs? Is it a situation that moving fewer pigs is more effective? What can we do to prevent it so we don’t have to use electrical stimulation at that point?

The use of electric prods differs by location and company. A farm site or packing plant may have rules limiting or prohibiting their use. Before loading pigs, drivers are encouraged to check with the loading and delivery facilities regarding policies and/or requirements with the use of electric prods. Drivers must always follow the facilities’ guidelines.

Points to remember:

• For herd flow, pigs must feel safe shifting their attention away from the handler enough to follow the herd’s movement.

• Pressure including handler noise, activity, and physical contact draws pigs’ attention to the handler. Pressure from behind pigs can draw pigs’ attention away from forward movement.

• Handlers must respect pigs’ flight zones when using handling tools. If you are close enough to touch a pig with your hand or other tools, you are inside its flight zone and risk stopping it. Following too closely behind encourages pigs to pile forward, stop, back up, turn back, or refuse to move.

• The more quickly and aggressively you move: the more you draw pigs’ attention, the bigger pigs’ flight zones, and the more space they require from you in order to feel safe.\textsuperscript{1}
When you are about to start moving pigs, take a minute to consider these questions:

- **What response pattern will help me the most?**
- **What pattern are the pigs most likely to give me in their current conditions?**
- **How do I work in the current conditions to get to the pattern I want?**
- **How do I maintain the desired pattern once it’s started?**
- **How does the way I use pig handling tools affect my outcome?**

<table>
<thead>
<tr>
<th>Group Pattern</th>
<th>Relationship to Handler’s Bubble</th>
<th>Emotional State</th>
<th>Attention</th>
<th>Effect on Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW Moving Forward</td>
<td>Able to move to stay out of bubble</td>
<td>Calm</td>
<td>Move with herd. Safe to shift attention away from handler</td>
<td>Easiest movement. Pigs moving pigs.</td>
</tr>
<tr>
<td>CIRCLE Moving past handler</td>
<td>Inside bubble with space to turn</td>
<td>Defensive or scared</td>
<td>Focus on handler. Get release from handler’s pressure.</td>
<td>Opposite direction of pressure. Speed up at point of release.</td>
</tr>
<tr>
<td>BUNCH Stopped, resist moving</td>
<td>Inside bubble, crowded</td>
<td>Defensive or scared</td>
<td>Focus on handler. Stay with the bunch.</td>
<td>Resist moving. Safer to stay with bunch than to leave handler.</td>
</tr>
</tbody>
</table>
Acceptable Equipment to Use When Handling Pigs

Sorting Board/Bi-Fold Panel
The most versatile tool is typically the sorting board or sorting panel and can be a single or bi-fold panel. A sorting board can provide both a physical and a visual barrier. Using a panel broadside to crowd or force pigs forward gives no release and encourages pigs to stop or turn back. If an animal does turn back, don’t try to hold back a pig with the board wedged against your legs/knees. Make sure to use the ground as an anchor or allow the pig to move past you and circle back.

Plastic Rattle/Shaker Paddle
The rattle/shaker paddle can provide auditory, physical, and visual stimuli. Shaker cans or bottles can also be used. Short intermittent spurts of sound can produce small bursts of speed but continuous sound inhibits movement. Rattle paddles can also be used to gently tap an animal, but should not be raised higher than shoulder level. Contact draws pigs’ attention. Pigs often brace against paddle contact rather than move away. Repeated contact and noise encourages pigs to bunch or stop movement. Paddles are most effective when used quietly as a visual aid. The large visible end doesn’t have to move very much to dramatically increase pressure.

Nylon Flag
A nylon flag is an effective visual stimulus in many cases, especially with larger pigs. Used correctly, it can draw a pig’s attention, as well as block its visual path.

Matador’s Cape
A matador’s cape can be effectively used as a visual barrier with nearly all pigs. Its main use is as a tool to block a pig’s vision and provide the illusion of a dead-end. Because it is not rigid, handlers are less likely to crowd pigs with a cape than with a sorting board/panel.

Plastic Ribbons on a Stick
Ribbons can be used as visual stimuli and when waved/flapped can help create distraction so that the pig moves in the opposite direction.

Electric Prod
An electric prod should be the tool of last resort. It should only be used when absolutely necessary and only following strict guidelines as previously described. Handlers should not constantly carry electric prods. It should be put away after it is used to move a pig.
Safe Animal Handling Practices

Human injuries happen more often when people are handling animals than during any other activity performed in pork production. Common handler injuries when moving pigs are contact injuries, slipping and falling, head cuts, or bumps and bruises when on the trailer. Handler scrapes, bruising and falls are some common injuries when moving sows or boars in the farrowing, gestation or gilt acclimation barns. Some of these can be prevented by being more aware of the environment. Power washer hook ups, cords from heat lamps, heaters and gating can all contribute to worker hand and limb injury. Handlers must remain aware of their environment to avoid injury.

Accidents are more likely to happen to new employees with 11 months or less of experience. The risk for injury increases again in workers aged 45 to 64. New handlers need training to understand how to best protect themselves. Even handlers who have years of experience must work to continue to wear safety gear and work at an appropriate pace to prevent injury.

Personal Protective Equipment (PPE)

To determine what PPE is required, the handler should conduct a hazard assessment. Walk through the tasks required during loading, transport and unloading. Then, considering the equipment to be used, make a list of potential injuries that could occur. Develop a list of PPE that should be used by the handler to help protect him or her from those injuries.

Typically, the minimum amount of PPE a handler should consider when handling pigs is a pair of safety-toed boots and a sorting board. Handlers operating inside a truck/trailer should also consider wearing knee pads and/or shin guards and a bump helmet or hard hat to protect themselves from possible injury due to contact with the trailer’s surfaces. For handlers entering the trailer, head injury is the most common injury reported. Wear your hard hat to avoid head cuts, bumps, and bruises.

All handlers should also consider using these PPE items, depending upon the hazard assessment and company protocols:

- Dust mask
- Eye protection
- Hearing protection
- Gloves
- Sort boards
- Shin guards
- Knee pads
- Hard hats
DOs and DON'Ts of Moving Pigs

1. **DO** prepare the barn for movement by removing visual gaps between pens and distracting elements.
2. **DO** walk pens daily.
3. **DO** move pigs in group sizes appropriate for the facilities.
4. **DO** move pigs at a normal walking pace.
5. **DO** pay attention to the eyes, ears, and body position of the pigs and adjust your position accordingly.
6. **DO** use animal handling tools to facilitate calm pig movement. Minimize or eliminate the use of electric prods.
7. **DO** wear proper personal protective equipment to prevent injury.
8. **DO NOT** use continuous noise when moving pigs.
9. **DO NOT** crowd the space of the rear pigs and draw the lead pig’s attention away from the flow.
10. **DO NOT** use rough physical contact when moving pigs. Willful acts of abuse are unacceptable.

Summary

How you choose to communicate with the pigs you move affects their behavior and meat quality:

- Walk pens on a daily basis.
- When moving pigs, act calmly and avoid sudden movement, loud noises, and other actions that may frighten or excite pigs.
- Move pigs at their normal walking pace.

As handlers:

- Understand basic handling protocols for certain sizes and types of pigs.
- Move the correct group size for the type of pigs being handled.
- Understand handling equipment and when to use these tools so they are effective.
- Minimize or eliminate electric prod use when loading pigs.
- Understand personal protective equipment for loading, transport, and unloading.
3. Facilities & Equipment

A pig may be loaded onto a truck, transported, then unloaded several times during its life. Safety practices need to be followed during each of these moves. A four-way interaction between animals, handlers, facilities and transport vehicles occurs during loading and unloading. Each of these components must be understood by the handler in order for safe and efficient loading and unloading to occur.

Planning

Proper preparation is critical when loading and unloading. It is important to have a clear plan and all handlers involved should understand the plan. It is a best practice to load and unload as a team with each individual handler having predetermined roles and responsibilities.

For example, have a clearly defined team lead that has the necessary authority to make decisions during the loading process, including whether or not to load or unload a specific animal. When loading finished market pigs, a pair of handlers may work to sort, or cut, the correct number of pigs from a pen into the alley, a third handler moves them down the alleyway to the doorway of the building, and a fourth handler moves them up the chute onto the truck. Understanding roles and following through with the team plan makes moving animals easier and helps reduce confusion and the potential for animal and/or worker stress during the handling process.

It is important for everyone to be aware of the timelines and follow them as closely as possible. If a delay occurs, this change in the timeline needs to be communicated to all involved in the transport process, including the people at the origination and destination points. Animal welfare is best managed when arrival times are as close as possible to what is scheduled. The scheduled arrival time needs to be considered when scheduling the loading time. All plants have policies that assist in minimizing time from trailer arrival to pig unloading. Plants work to schedule pigs so that trucks have minimal wait time prior to unloading. In the winter, waiting pigs may get too cold and suffer frost bite. In the summer, waiting pigs may get too hot. If hot pigs cannot be misted or unloaded immediately, trailers may need to keep moving to circulate air. If pigs are backed up during hot weather or during other critical situations, plant communication policy may include radio requests to keep transporters moving until requested by plant to arrive, parking location requests to optimize animal comfort, requests to postpone loading of animals on farm; or in extreme back up, requests to unload at an alternative location such as an auction market or another plant. Plants do realize that variation in arrival time can occur due to unforeseen events. However, any change in your schedule must be communicated to the plant to help manage unloading traffic.

Also keep in mind that the loading/unloading plan should follow biosecurity protocols. Introducing a disease to the farm can be a multi-million dollar expense. Follow the farm’s biosecurity protocol exactly. More information on biosecurity can be found in in Chapter 6.

Facilities and Equipment

Facilities should be properly designed and constructed, and in good repair, with functional equipment in place before loading or unloading pigs. Designs that provide consistency of width from alleyway to the truck are ideal because the hourglass effect of a smaller doorway or chute is eliminated. This chapter provides recommendations for facility designs that facilitate easy pig movement. However, there may be other configurations that are also effective, but may require different handling skills to prevent animals from balking, jamming or becoming stressed.
Lighting should be routinely checked in all movement areas. Areas that switch from light to dark discourage movement. Likewise, areas that have strong shadows or light shining into the eyes of the pig also discourage movement. Recent chute design research has tested rope lighting that provides a soft continuous light source that minimizes shadowing.19

**Alleyways and Doorways**

When building a new finishing barn, the width of the alleyway is an important design component for animal handling. Alleyways should be 3-feet wide to accommodate moving three to five finishing pigs of current market weight (~280 lbs.). This will allow two pigs to walk side by side without jamming, thereby reducing stress and speeding up the movement of pigs. Doorways should be at least the same width as the alleyway and the door should open completely to eliminate pinch points. Avoid thresholds on the floor of the doorway to reduce balking.

**Ramps and Chutes**

The design of the loading ramp or chute has a significant effect on pig welfare. Goals of loading chute design should be to facilitate easy pig movement, reduce incidence of slips and falls, and avoid injury and stress to the pig. The correct angle of incline on ramps is very important to promote successful pig movement.

As a general guideline, ramps should be 20 degrees or less. Research has shown that ramp angles over 20 degrees cause an increase in balking and backing up behavior of pigs, an increase in physical interventions by the handler, and increased loading and unloading times.20 Lower angled ramps, such as 10-13 degrees, are much easier for pigs to use. Poor handling can nullify any benefit of good chute design.

Because most ramps are a fixed ramp incline length, and trailers are typically a fixed height, it may be useful to be able to calculate whether the angle of the ramp exceeds the suggested maximum ramp angle. To determine the current ramp incline angle, divide the ramp height by the ramp incline length. If the answer is greater than 0.34, the incline angle of your ramp is too steep for optimal pig loading.

\[
\text{If Ramp Height} \div \text{Ramp Incline Length} < 0.34202 \\
\text{the incline angle is less than 20 degrees}
\]

Example: Ramp Height = 3.75 feet  Ramp Incline Length = 8 feet

\[
3.75 \text{ feet} \div 8 \text{ feet} = 0.46875 \\
0.46875 > 0.34202 \text{ so the incline angle IS NOT acceptable}
\]
The following items are critical to proper ramp and chute design:

- Concrete ramps should have stair steps and nonslip surfaces to provide traction and help avoid slipping. It is recommended that the stair steps should have a 2.5-inch rise and a 10-inch tread.
- Ramps for market and adult pigs should have cleats spaced eight inches apart.
- Ramps for piglets and nursery pigs should have cleats spaced three inches apart.
- Ramps should have a flat dock at the top for pigs to step onto when they exit the truck and before they enter the ramp.
- A pig views a 90-degree turn as a dead end and may stop or try to turn around. Ramps should be straight with no 90-degree turns. If a straight ramp is unachievable, curves are preferred over sharp turns and angles to facilitate pig movement.
- Chute width should match or be slightly smaller than the trailer entry width, which is normally 36 inches. The width should be less than 36 inches but greater than 32 inches.

Other design aspects that promote better pig movement are:\(^{19}\)

- Covered chute (aluminum or other material)
- Cushioned bumper dock system to completely eliminate gaps from the barn to the chute
- Flooring material of metal coated with epoxy to mimic the feel of concrete

Recent studies show that these chute design parameters have a better chance of providing unidirectional flow and a consistent rate of movement. This design performed better at optimizing meat quality over traditional chute design. Consider these components when updating your chute or ramp.

Maintenance and repair of ramps is also important.

- Sharp, protruding or otherwise injurious items should be removed or repaired.
- Broken or missing cleats should be repaired or replaced.
- Moving parts such as cables, pulleys and hinges should be inspected regularly and maintained as necessary.
- Ramps and chutes should be kept free of trash, debris and other potential distractions.
- Chutes should have adequate lighting to aid in the movement of pigs. An industrial rope lighting system inside the chute can provide a soft continuous light source that minimizes shadowing.
Transport Trailer

Trailers should be kept in good repair and should be kept clean. The trailer should have non-slip solid flooring to prevent the animals from slipping and falling. All gating and doors should open and close freely and must be able to be secured shut and not have gaps where pigs can get their head or legs stuck or fall out of the truck. Internal ramps should function properly and extend all the way to the floor. There should be no sharp or protruding objects in the trailer that may injure the pigs. Ensure drain plugs are securely in place prior to loading pigs onto the trailer. Trailer interiors should be equipped with sufficient lighting if loading or unloading trailers in the dark. Trailer ramps angles should be 20 degrees or less to help with pig movement in the trailer.

If the trailer has a misting system on board, the equipment should be kept in good working order, especially in the warm to hot temperatures. Plugs or panels must be available for use during colder temperatures to help regulate the internal temperature. Sudden or unexpected fluctuations in temperatures can be managed easier with weather panels than with plugs.

Preparation for Loading, Transport and Unloading

The transporter should consider completing a preparation/loading/unloading checklist for each load of pigs. This checklist may include actions to consider in preparation for arrival at the loading location, during loading, while in transit, and at unloading. A sample checklist is shown in the appendix.

Summary

- Facilities and equipment affect animal handling.
- Preparation and routine inspection of equipment and facilities is important to a successful transport event.
- Each person must know their responsibilities during loading and unloading.
- Safety practices during loading, transportation, and unloading practices:
  - Proper preparation and a clear plan with all handlers is critical.
  - Facilities should be properly designed and constructed with functional equipment in place (i.e. lighting, alleyways/doorways, ramps/chutes, etc.).
  - Trailers should be properly prepped (i.e. bedding, boarding etc.) and be in good working order (i.e. gating, ramps, etc.).
4. Loading, Unloading & Transportation

Transportation may be a stressful event in the life of a pig and is thought to be the most influential pre-harvest factor affecting final pork quality. Transportation involves factors that could be perceived as stressful to a pig, such as unfamiliar noises and vibrations, rounding corners, changes in speed (acceleration/deceleration) and potential temperature extremes. Handlers and transporters should implement procedures that make transportation as safe and humane as possible. Before loading a truck, it should be correctly prepared for its journey including determining loading density, proper setup for weather conditions and scheduling of transport. Be especially aware of and prepared for weather changes as you move from region to region.

Scheduling

Communication between the transporter and the loading and unloading locations is essential. It is important that all loads are scheduled regardless of the type or size of pigs. It doesn’t matter if you are delivering finished pigs to the harvest plant or a load of nursery pigs to a finishing site. The goal of everyone involved in scheduling transportation is to minimize the amount of time pigs must be on a trailer.

Not following scheduled delivery times can cause backups at the plants, which result in increased waiting times for other drivers and pigs. Plants have limitations on how long trailers can wait in line before unloading. If you experience a travel delay, it is important to communicate this to the destination so they can make alternative arrangements. If you have an extended wait time to unload at the plant during hot weather, ask the plant personnel how they would like you to keep the pigs cool on the truck.

The following items will help minimize transport stress on the pigs and reduce the potential for negative impacts on pork quality:

- Maintain a steady pace on the road.
- Minimize the total number of stops.
- Avoid sudden stops, starts, and sharp turns.
- Follow the delivery schedule closely.

Loading and Unloading Pigs of Various Sizes

Most basic loading and unloading protocols are similar and apply to nearly all pigs, but requirements for certain sizes and types of pigs differ and specific techniques may need to be used.

Some common points to remember when loading and unloading pigs, regardless of size, include:

- The handler should carefully use the pigs’ flight zone to get the animals to go where the handler desires.
- Use proper handling tools to help move the pigs (Chapter 2). Sorting boards or bi-fold panels are essential tools proven to assist in safe movement of pigs. An electric prod should not be the primary handling tool. If absolutely necessary, use according to the guidelines provided in Chapter 2. Many packing plants have rules limiting or eliminating their use. Follow your packing plant’s guidelines.
- Pigs should be moved in the correct group sizes (Chapter 2). For example, do not unload an entire trailer compartment at one time. There may be specially designed trailers or unloading facilities that allow for larger group size during the unloading.
process. Check with receiving personnel to determine the best group size for the situation and receiving facilities. 3-5 pigs is an appropriate group size for finished pigs.

- Getting the first pig in a group moving to enter a chute when loading or unloading may be the most challenging. Once the leader is moving the other pigs may move easier due to the “follow the leader” herd instinct.

- Do not load any ill, injured, or fatigued pigs onto a truck. It is the position of the National Pork Board that any pig unable to walk is ill, or significantly injured and should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the pig should be humanely euthanized. The driver has the responsibility to report to their supervisor any ill, injured or fatigued pig loaded onto a truck.

- Pigs that become ill, injured or fatigued should be handled according to the protocols denoted in Chapter 5.

### Loading and Unloading FINISHED PIGS

Finished or market pigs are usually 260 pounds or more. The handler should use the pigs’ flight zone to get the finished pigs to go where the handler desires. Handlers should rely on a sorting board instead of their bodies to turn or stop market pigs. If an animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk a potential injury. Some points to consider when loading and unloading finished pigs:

- Watch for signs of fatigue, including open-mouthed breathing, inability to move and splotchy skin as described in Chapter 5.

- An electric prod should not be the primary handling tool. If absolutely necessary, use according to the guidelines provided in Chapter 2.

- Good handlers use sort boards and rattle paddles when moving pigs. Use handling tools properly as described in Chapter 2.

- Never load the trailer top heavy. Always load the bottom deck first and unload it last. This is especially important when making multiple stops to fill a trailer. Top heavy loads are at higher risk of turnover.

- Unless otherwise directed by receiving personnel, move pigs off the trailer in small groups of 3 to 5 pigs at a steady calm pace. This is especially important if the packer is tattooing as pigs exit the trailer.

- Plants that choose to tattoo pigs as they exit the trailer should create a blind to hide the handler performing the tattooing. This will prevent the pigs from freezing, bunching or turning back into the truck.

- The person performing the tattooing should never peer around the blind into the truck as this will disrupt pig movement.

- The person performing the tattooing should make sure the animal’s shoulder has passed by them before they tattoo the animal to prevent disruption of pig movement.

- Blinds set further away from the truck will also prevent disruptions in pig movement but allow observation of the driver and the unloading process.

- Never use aggressive behavior with pigs during unloading.

- Unload in a manner that is safe for you and safe for pigs.

- Make sure your trailer is aligned with the ramp so there are no gaps. Pigs can get their legs trapped between the trailer and the ramp. Pig legs can be broken if they get a leg stuck and the pigs behind them keep coming.
When you arrive at the packing plant:

- Sign in upon arrival and have your TQA Certification card with you.
- Some plants have a Humane Treatment of Animals form that you must sign prior to unloading every group of pigs.
- Let the plant know if you have more than one lot of pigs on a trailer that requires more than one tattoo.
- Remember that all animal handling activities on plant property must be in compliance with federal regulations and FSIS inspection. Animal handling activities on plant property are also routinely audited by customers and other third-parties. This includes:
  - Amount of time trailers spend waiting to unload,
  - Condition of the trailer transporting the pigs,
  - Animal handling practices and tools of transporters and plant personnel,
  - Attitude and behavior – such as yelling, swearing or banging equipment or gates – of transporters and plant personnel.
- Never interfere with other drivers’ unloading or animal handling activities.

If you have problems while unloading at the plant:

- If you are in a difficult situation with a pig and need help, ask the plant personnel for help. The objective is to ensure human safety as well as humane handling of the pigs.
- If the plant personnel ask you to stop what you are doing, please immediately stop. There is a reason and they should work to communicate the reason behind the request. Sometimes the reason may relate to something inside the plant. Other times the reason may be the handling method being used. You must stop and wait for more information before proceeding to unload.
- Concerns about animal handling at the plant should first be directed to the livestock manager at the plant followed by the producer you are hauling for.

**Loading, Driving, and Unloading WEANED PIGLETS AND NURSERY PIGS**

Weaned piglets are sometimes moved directly from a farrowing room to a nursery or a wean-to-finish facility off-site. Nursery pigs, also known as feeder pigs, typically weigh approximately 40 pounds or more when moved to finishing facilities. These piglets and pigs must be given extra time and moved carefully so they are not injured. Some points to consider when loading and unloading piglets and nursery pigs:

- Make sure your trailer is aligned with the ramp so there are no gaps. Weaned pigs can get their legs trapped between the trailer and the ramp. Pig legs can be broken if they get a leg stuck and the pigs behind them keep coming.
- Use extra care and allow extra time for these pigs to move up, or down, the ramp and chute.
- Avoid excessive noises such as yelling or banging on the truck or wall to rush and crowd pigs into or out of the truck and into the chute during movement.
- Electric prods are unnecessary with weaned piglets and nursery pigs and should be avoided.
- Use proper handling tools as described in Chapter 2.
- Drive slowly on rougher rural roads.
- Avoid sudden forward movement as pig piling is a risk at this age.
- Give plenty of time for braking when you have weaned pigs or feeder pigs on board. If braking is done too abruptly, pigs will pile and severe injury can occur.
Loading, Driving, and Unloading BREEDING STOCK

Breeding animals are typically reared off-site and are transported to a breeding herd as a gilt or boar. When they are culled, or removed from the breeding herd, they must then be moved to market. Moving these large, sexually mature pigs can sometimes present a challenge. Some points to consider when loading and unloading breeding stock:

- Make sure your trailer is aligned with the ramp so there are no gaps. Pigs can get their legs trapped between the trailer and the ramp. Pig legs can be broken if they get a leg stuck and the pigs behind them keep coming.
- These pigs are most likely being mixed with unfamiliar animals which may result in aggression. Handlers should be careful not to be in the pigs’ way if aggression occurs.
- When breeding stock is unloaded into an unfamiliar facility, allow the animals extra time to explore and become comfortable. Do not rush them.
- Boars may need to be loaded individually, and/or penned separately once on the truck, to prevent injury from fighting or to prevent them from attempting to mount a female or fellow male during transport.
- It is unacceptable to cause physical damage to the snout of a boar as a means to reduce aggression.
- If tusk trimming must be done, at least 0.8 inch of tusk should be left beyond the gumline to avoid cutting into the nerves and pulp of the tooth. A dehorning wire to saw through the tusks will reduce the occurrence of the tooth splintering.21
- Remember, these animals are typically larger than the average finisher pig. Do not load them in the same compartment with finisher pigs for boars may attempt to mount or fight other pigs.
- Drive slower on rougher rural roads. The legs of breeding animals are important for their longevity and we must take care to avoid bumps that could injure these very valuable animals.
- Take turns slowly to avoid piling of animals.
- Give yourself plenty of time to brake. Braking suddenly may cause animal injury.
- An electric prod should not be the primary handling tool. If absolutely necessary, use according to the guidelines provided in Chapter 2.

Handler Safety in the Trailer

Here are some safety items to consider when working in a transport trailer.

PPE

Using personal protective equipment (PPE) while loading or unloading a trailer can help protect you from injury. Common PPE for loading and unloading includes a hard hat, sturdy footwear with a steel toe-cap and good traction, shin and knee pads, ear plugs and dust masks. Keep your PPE clean and in good working order.

- Hard Hat.
  Head cuts, bumps and bruises are some of the most common injuries inside a transport trailer. Some packers require that you wear a hard hat in your trailer once you are on their premises.
- Footwear.
  Wear appropriate footwear, designated boots or plastic pullovers over boots. The trailer is a slippery environment and good traction on boots will help. Steel toe-cap boots will help prevent foot injuries if an animal steps on your foot.
• Shin and knee pads. 
  Consider use of shin guards and knee pads. Injuries to knees and shins are common. Using a sort board correctly will serve as a safety barrier but further protection can be achieved by wearing shin and knee pads.

• Wear ear plugs and facemasks as needed. 
  While it is always best to move animals calmly and quietly, the animals may sometimes squeal or make a lot of noise. Prolonged exposure to loud noise can cause damage to hearing. Wearing hearing protection, either earplugs or ear muffs can help prevent irreversible hearing loss. 
  Dust from the trailer bedding and animals may cause respiratory problems. Use a properly fitted respirator (dust mask) will help to reduce inhalation of dust particles.

Fall safety
Falls from livestock trailers can and have caused severe debilitating injuries. Being aware and taking the following precautions can minimize your risk of a fall:

• Do not lean on doorways when in the trailer. Doors may not be latched properly and may open unexpectedly.

• Do not pull or swing dead pigs out of the second deck. First see if the dead pig can be moved to the first deck. If not, pull the pig to the second deck door and then push out. **Do not try to swing pigs out with a snare from the second deck instead of pushing them out.**

Other safety tips during loading/unloading trailers

• Make sure the snare is secure behind the rear hock of the pig prior to leveraging your weight to move a dead pig. Even if it is secure, avoid throwing your weight in a way that you might lose your balance if the snare or shackle slips. Short steady pulls are safer than fast lunges. **Severe injury to handlers can and has occurred when snares and shackles slip.**

• Do not crawl over the first group of pigs that need to leave the trailer. Instead, use the pigs’ flight zone and handler bubble to encourage forward movement as we discussed in Chapter 1.

• Do not jump over or walk on top of gate dividers in the dock area.

• Do not engage in horseplay on site.

• In hot weather, make sure to stay well hydrated.

• If you need assistance with a pig or a situation of concern, ask for help.

In case of injury on the plant site:

• Notify a dock monitor or livestock management of the situation.

• Packer personnel will assist the transporter in first aid and in serious cases, engage emergency responders.

• All injuries, no matter the seriousness, need to be documented while on the plant site.
In cases of a motor vehicle accident on the plant site:
• Notify a dock monitor or livestock management or security of the situation.
• Packer will assist the transporters with calling the proper authorities if necessary to evaluate any damage.
• All accidents, no matter the seriousness, need to be documented while on the plant site.

Transport Space Recommendations
Overcrowding pigs on a trailer is an easy and preventable mistake. This costly error can put an animal’s safety at risk and cause losses to the producer and the harvester. A perceived saving in transportation costs is far outweighed by the possibility of reduced pork quality, compromised animal well-being or even death.

Overcrowding is never a viable option when transporting animals. Signs of overcrowding may include piling, excessive squealing or panting. Gates should be able to close without having to force the pigs into the space. Once a gate is closed, watch to see if the pigs have room to stand without climbing on top of each other. Listen for pigs that are squealing due to being stepped on or crowded. If overcrowding is suspected, reduce the number of head per compartment. Pigs in overcrowded conditions will quickly overheat and begin panting and open-mouth breathing and may become injured, fatigued or even die.

Review these standard transport space recommendation statements:
• Generally, space allowances should be such that pigs can lie down and stand up, in their normal position.
• On short trips pigs may prefer to stand. Pigs need space to lie down on longer trips. If there is not enough room, pigs may compete for floor space, generating heat, noise and stress.
• The trailer should have compartments with gates or dividers with working latches to limit the number of pigs in each given area.
• Weather conditions and animal size should be considered when determining the number of animals to load.

The transport space recommendation table shows the recommended space per pig under normal weather conditions (not hot or cold extremes). Transport losses are minimized at these recommendations, but optimal floor space is dependent upon temperature, trailer design, compartment size, etc. Changes in loading density need to be made to accommodate the weight of the pig or weather conditions. The need for these changes may outweigh transport costs and number of pigs left in the barn on a given day for the benefit of the animal’s well-being. Research has shown that increasing loading density also increases transport losses.

<table>
<thead>
<tr>
<th>Average Weight (lbs)</th>
<th>Square Feet Per Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.652</td>
</tr>
<tr>
<td>50</td>
<td>1.53</td>
</tr>
<tr>
<td>100</td>
<td>2.32</td>
</tr>
<tr>
<td>150</td>
<td>2.95</td>
</tr>
<tr>
<td>250</td>
<td>4.26</td>
</tr>
<tr>
<td>275</td>
<td>4.57</td>
</tr>
<tr>
<td>300</td>
<td>4.79</td>
</tr>
<tr>
<td>350</td>
<td>5.48</td>
</tr>
<tr>
<td>400</td>
<td>6.39</td>
</tr>
<tr>
<td>450</td>
<td>7.00</td>
</tr>
<tr>
<td>500</td>
<td>7.69</td>
</tr>
<tr>
<td>550</td>
<td>8.39</td>
</tr>
</tbody>
</table>

*when weather conditions become extreme, consult Cold- and Hot-Weather sections for adjustment.
Weather Conditions

Improper preparation for various weather conditions, especially temperature extremes, costs the U.S. pork industry millions of dollars annually. Handlers and transporters are responsible for understanding the effects of weather on pigs undergoing transport and how to protect pigs during weather extremes. Transporters should check weather conditions along their transport route and make ventilation adjustments before pigs are loaded onto the trailer. Weather forecasts are available through local radio or television or by visiting a national web site such as www.weather.gov or www.weather.com.

Pigs do not have a thick coat of hair nor do they have the ability to sweat, making them sensitive to heat and cold stress. While temperature is not always the primary cause for pigs becoming DOA or non-ambulatory, it can be a factor. The following charts show the impact of temperature on the incidence of transport losses. This means that DOAs are most likely to occur June through September and non-ambulatory pigs are most likely to occur September through February.

Cold Weather

Freezing temperatures and wind chills are very dangerous to the safety of pigs. Cold temperatures are amplified by wind speed. In cold temperatures, overcrowded pigs that cannot seek the protection of bedding from wind and low temperatures are potentially subject to frostbite. Frostbite can result from wind, but it may also occur from being pressed against the side of the trailer. Pigs that arrive at the packing plant with frostbite are disapproved by USDA inspectors and plant personnel. Frostbite can result in lower value for the pig due to trim loss or even condemnation by the USDA inspector. Newly weaned piglets and nursery pigs are especially susceptible to cold temperature extremes.

The National Weather Service has developed a chart to indicate the amount of time before frostbite will occur at a given wind chill level. This chart demonstrates how quickly frostbite can occur under severe winter weather conditions and should be taken into account when using boards or plugs on a trailer. However, wind speeds are always significantly less inside the trailer meaning the wind chill is not the same inside the trailer as out. Often it is warmer because of the heat production from the pigs. Temperatures inside the trailer can be managed even more with proper boarding.

The following measures are precautions to be taken to help ensure the well-being and safety of pigs being transported:

- Make sure trailer is completely dry after washing.
- Use proper bedding and boarding based on the weather conditions.
- Use panels to protect pigs at pig level from crosswinds.
- Block or plug a portion of the ventilation holes/slots at pig level.
- Keep pigs dry.
- Load fewer pigs per load so they can move away from sides of the trailer.
• If you have to stop during extreme cold weather, monitor trailer conditions and adjust trailer boarding to ventilate the trailer to prevent condensation build-up.
• Provide extra bedding – note table on following page.
• Bedding should be clean and dry before pigs are loaded.

The table at right illustrates recommended truck set-up procedures for finished pigs during temperature extremes. These are based on two research projects conducted in the Midwest but may not be appropriate for every geographical location. These projects were done using two-deck trailers. Trailers with more than two decks may require additional bedding.

Bedding can serve multiple purposes. In cold temperatures, the bedding material prevents the pig from coming into direct contact with the metal. Therefore, the floor should be covered at the time of loading so the pigs do not come into contact with the floor. Bedding also helps with moisture control and footing for pigs and the handler. The volume of bedding needed will be dependent on the distance of transport. The use of no bedding is an acceptable practice in certain areas of the United States depending on duration of the trip, cleanliness of the truck, time of year as well as trailer flooring design. All adjustments to bedding levels (or no bedding) must not create issues with the comfort and welfare of the pigs. Professional judgment of the driver and transport staff and knowledge of the local conditions may allow for using different bedding levels than recommended here. Drivers are responsible for understanding bedding requirements at the plants to which they are delivering. Use of excessive bedding during warm or hot weather may cause increased pig losses. Improper bedding or boarding may result in disciplinary actions by the receiving facility.

### Recommended Truck Setup Procedures Based on Air Temperatures (Market Pigs)

<table>
<thead>
<tr>
<th>Estimated Air Temperature</th>
<th>Bedding* (minimum recommended bags/trailer)</th>
<th>Side-Slats</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 10°F</td>
<td>Heavy (6 bags)</td>
<td>90-95% closed</td>
</tr>
<tr>
<td>11-20°F</td>
<td>Heavy (4-6 bags)</td>
<td>75-90% closed</td>
</tr>
<tr>
<td>21-30°F</td>
<td>Heavy (4-6 bags)</td>
<td>50-75% closed</td>
</tr>
<tr>
<td>31-40°F</td>
<td>Medium (3-4 bags)</td>
<td>50-75% closed</td>
</tr>
<tr>
<td>41-50°F</td>
<td>Medium (3-4 bags)</td>
<td>25-50% closed</td>
</tr>
<tr>
<td>51-60°F</td>
<td>Medium (3-4 bags)</td>
<td>0-25% closed</td>
</tr>
<tr>
<td>61-90°F</td>
<td>Medium (3-4 bags)</td>
<td>0% closed</td>
</tr>
<tr>
<td>&gt; 90°F</td>
<td>Light (1-2 bags)</td>
<td>0% closed</td>
</tr>
</tbody>
</table>

*Bedding refers to a 50-pound bale of wood shavings.

---

Photos courtesy of Angela Green, 2013 “Establishing Bedding and Boarding Requirements for Finisher Pigs Through Scientific Validation – Micro-study”
**Weaned pig transport**

As with finished or adult pigs, any wean pig transport must be well planned and take into account such aspects as preparation and age of the pigs, choosing the best route and vehicle type, assuring adequate vehicle design and maintenance, and the changing weather conditions during transport. Every effort should be made to avoid transport at extreme hot or cold temperatures and drivers must provide sufficient protection in winter. The suggested minimum guidelines for market pigs may also serve as a basis for boarding and bedding requirements for weaned pigs, with the understanding that this will vary greatly depending on the age and size of the pigs, the trailer design, the length of the transport and stocking density of the trailer.

**Hot Weather**

Hot weather and high humidity can be deadly to pigs due to their lack of functional sweat glands.

Refer to the livestock weather safety index (at right) prior to loading. The weather safety index provides a guide to help reduce heat stress of livestock. Hazard to the pig increases when both temperature and humidity increase. When conditions are in the ‘alert zone’, transporters need to be careful to keep livestock cool. When conditions get into the ‘danger’ and ‘emergency zone,’ try to shift loading schedules to avoid the hottest part of the day.

The following measures are special precautions to be taken during the danger and emergency scenarios as outlined above. These will help keep your pigs cool and to help ensure the well-being and safety of pigs you are transporting during hot weather conditions:

- Open nose vents.
- Unplug ventilation holes/slots.
- Adjust loading density of pigs in the truck by loading fewer pigs per load. For example, provide 300-pound pigs with 5.0 ft².
- Schedule transportation early in the morning or at night.
- Be prepared to adjust to rapid temperature fluctuations such as the first warm day(s) of spring.
- Do not bed pigs with straw in hot weather.
- Load and unload promptly to avoid heat buildup.

Wetting pigs during transport can be an effective cooling method for high temperatures. The following are guidelines for wetting pigs during hot weather conditions:

- If the temperature is over 80° F (27° C), wet pigs for 5-10 minutes during or after loading. Be careful of over wetting to prevent excess humidity build-up or runoff.
- Use a large droplet spray, not a fine mist.
- Large amounts of cold water applied to an overheated pig (open mouth, panting, with blotchy skin) may shock or kill it.
• If possible, you may need to wet pigs while waiting at the plant. Trailers will have better air flow if trucks do not park side by side.

• For wetting to work, animals should be made damp and then allowed to dry. The wetting process should be monitored to prevent excess humidity build-up.

• **Air movement is needed for evaporative cooling to work. Trucks should be in motion, have access to fans or crosswinds.**

• Allowing time for evaporation of the water will remove body heat from the animal.

• Pigs should not be wet again until evaporation has occurred.

• Continual wetting with no time for evaporation can increase heat stress by creating a sauna effect.

**It is the transporter’s responsibility to protect pigs during all weather conditions.** It may become necessary for transporters to adjust trailer ventilation during the journey due to changing weather conditions. This may be true for long journeys across geographical regions or for spring and fall days that have wide temperature variations. Journeys spanning multiple regions may involve weather condition planning. Side boards or plugs should be added or removed accordingly to prevent the pigs becoming too hot or cold.
**Stopping**

It is imperative that pigs be transported in a humane, safe and timely manner. Stopping with a loaded trailer, especially during extreme temperature conditions, should be avoided to help prevent unnecessary increases in stress and death loss. Trailers utilize passive ventilation and only have air flow when the trailer is perpendicular to prevailing winds or when the trailer is moving.

- Trucks should continue in motion during extreme weather conditions (unless it is impossible for safety or other reasons).
- If pigs cannot be unloaded upon arrival in hot weather continue driving, if possible, to generate air flow for the pigs until they can be unloaded.
- Utilize water sprinklers and fan banks at the packing plant to circulate air through waiting trailers.
- Do not park near other animal transporters due to the potential for reduced air flow and the increased risk of disease transfer.
- If stopped during hot weather, slat and hole covers must be removed to allow for additional air flow and for water sprinklers in the trailer to be activated.

When there is no air flow, the body temperature of the pigs will cause the internal trailer to increase rapidly as shown in the graph at left.26

---

**Summary**

- Scheduling loading and unloading times will minimize the amount of time pigs must be on a trailer.
- Different sizes of pigs may require different techniques for loading and unloading procedures.
- Handler safety in the trailer is important. Be sure to follow your company’s safety protocols.
- Pigs should not be overcrowded on the trailer. Fewer pigs should be loaded in severe cold or hot temperatures.
- Handlers must prepare trailers for weather conditions by using bedding, boarding or by wetting.
- Managing weather extremes on the trailer will help reduce the incidence of transport losses.
- Stopping the trailer while transporting pigs should be avoided if possible.
- Drivers should have an emergency plan in place to address pig well-being during unexpected stops.
5. Fitness of the Pig

Fitness to Transport

It is the position of the National Pork Board that any pig unable to walk, is ill or significantly injured, should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the pig should be humanely euthanized. Any pig that becomes fatigued should be moved to a resting area in an appropriate manner. A fatigued pig is defined as having temporarily lost the ability to walk but has a reasonable expectation to recover full locomotion with rest. A resting area helps enable recovery by minimizing competition for feed and water and provides the opportunity for monitoring.

All pigs that are scheduled for transport should be evaluated by a handler for fitness to travel. If a pig is found to be unfit, it should not be loaded. Instead it should be segregated for treatment or humane euthanasia.

The following list provides some examples of animals that are unfit to be transported, including, but not limited to:

- Those that are sick, injured, weak, disabled or fatigued
- Those that are unable to stand unaided and bear weight on each leg
- Those that are blind in both eyes
- Those that cannot be moved without causing them additional suffering
- Newborns with an unhealed navel
- Pregnant animals that would be in the final 10 percent of the gestational period at the planned time of unloading (They may be transported if special conditions are provided and additional attention is given during transport)
- Females traveling without young who have given birth within the past 48 hours
- Those whose body condition would result in poor welfare because of the expected climatic conditions

Fitness Concerns

Loading and unloading processes can be stressful events in the life of a pig. As described in Chapter 2, inappropriate handling techniques (aggressive handling), causing excessive stress and muscle exertion during loading and/or unloading, can exacerbate the stressfulness of this situation and potentially cause serious health problems and even death. Several of the more common causes of transport losses are heat stress, increased heart rate and heart failure, porcine stress syndrome (PSS) and fatigued pigs.

Fatigue

Fatigued pigs are defined as pigs that have temporarily lost the ability or the desire to walk but have a reasonable expectation to recover full locomotion with rest. Fatigued pigs typically have an acid-base imbalance due to excessive muscle exertion that makes the blood more acidic in nature. This condition is commonly referred to as metabolic acidosis and can cause pork quality defects resulting in meat that is of low quality and of significantly less value to the industry than normal pork.
This diagram (at right) illustrates many of the contributing factors that can lead to injured, stressed or fatigued pigs. Take note of the factors that can be controlled by the producer, handler or transporter. Each of these factors can be controlled or manipulated by one or more persons involved in the handling and movement of the pigs.

When a pig experiences stress during handling or transport, it will display open-mouth breathing, skin discoloration or both. If the stress is not removed or if additional stressors are introduced, the pig will become reluctant to move, make abnormal vocalizations, develop muscle tremors, or some combination of these signs.

At this stage, the pig may become overwhelmed by the accumulation of stress, in which case the pig will collapse and become non-ambulatory, and, in extreme cases, death may ensue. Therefore, transporters and handlers must be able to identify the following signs of stress and take the appropriate action(s) when needed.

- Open-mouth breathing (panting)
- Vocalization (squealing)
- Blotchy skin
- Stiffness
- Muscle tremors
- Reluctance to move

Additionally, a pig’s heart rate and rectal temperature increase when excessively stressed or muscles are overexerted.

The graphs at right depict physiological differences between pigs handled gently and aggressively. Gentle handling consisted of moving pigs at a slow and calm pace with a plastic cane, whereas aggressive handling involved moving pigs rapidly with electric prods.

**Heat Stress**

Heat stress occurs when the pig’s body temperature rises to a level it cannot control through its normal panting mechanism. A pig in distress will be making deep, gasping sounds. This pig should be attended to immediately or it will die. Do not make this pig move. Allow it to rest. Gently sprinkle the animal with cool water. Do not pour large amounts of cold water on the pig as the shock may kill it.
**Porcine Stress Syndrome (PSS)**

Porcine Stress Syndrome is an inherited disorder that can occur in pigs that carry the halothane gene. Animals with this genetic defect are extremely sensitive to stress and must be handled with extra care. When a PSS pig is stressed its body temperature rises, its skin develops red blotches, it collapses and its muscles become rigid. Immediate treatment is required using the same techniques as for a heat-stressed pig. Due to selective breeding, this gene is rarely present in the pigs found in today’s commercial herds.

**Total Transport Losses**

Transport losses at U.S. packing plants include:

- Dead on arrival (DOA): a pig that died during transportation
- Dead in yard (DIY) or dead in pen (DIP): a pig that died after unloading at the plant
- Non-ambulatory pig: a pig unable to move or keep up with the rest of the group at the plant

It has been estimated that 0.7% of those transported to market either die (0.25%) or become non-ambulatory (0.44%). However, it is important to note that these values vary by year and season. For example, the national average for the percentage of dead pigs at U.S. packing plants over the last five years was 0.19%, but these values increased during the summer months.
Managing Ill, Injured or Fatigued Pigs

Prevention, preparation and prompt action are keys to the proper handling of pigs. What causes a pig to become a fatigued pig is not well understood although it is known that good production practices, along with proper handling, reduce the incidence of fatigued pigs.

**Prevention and Preparation**

- Pigs that are ill, injured or fatigued must be handled in a humane manner.
- Proper handling and movement of ill, injured or fatigued animals should be included in the general handling and movement policy of production, transportation and harvest operations.
- Producers should seek to prevent illness and injuries by feeding nutritionally sound diets, maintaining effective health programs, providing good facilities, handling pigs properly and selecting genetically and structurally sound breeding stock.
- A resting area can help ill, injured or fatigued pigs recover by minimizing competition for feed and water and provides the opportunity for monitoring.
- Pigs that appear healthy but have a history of health or respiratory problems may be more susceptible to handling and transport stress and should be handled with extra care.

**Loading**

- The position of the National Pork Board is that any animal that is unable to walk, is ill or significantly injured should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the animal should be humanely euthanized.
- The driver has the responsibility to report to their supervisor any ill, injured or fatigued pigs loaded onto a truck.

**Transportation**

- Safety and well-being should be the primary concern when transporting pigs.
- Transport can be a stressful time for pigs and even healthy animals can lose up to 5 percent of their body weight during a 4-hour transport.\(^{39}\)
- Pigs that become ill, injured or fatigued during transport should be segregated upon arrival and care given for their special needs.
- Any animal that becomes ill, injured or fatigued during transportation to a harvest facility should be handled in a manner that is consistent with the recommendations found in the Animal Handling Guidelines published by the North American Meat Institute.\(^{40}\)

**Unloading**

- Notify the receiver of any ill, injured or fatigued animals on the transport vehicle before it is unloaded.
- Never throw cold water on an animal that has collapsed from over exertion. If used, water should be applied as a sprinkle.
- At no time is it acceptable for a live pig to be dropped to the ground from a transport door or other elevated surface.
- At no time is it acceptable to drag a live pig by ears, legs, or tail.
- Do not use your foot or in any way force any pig to move.
- Transporters should ask the receiving location personnel for assistance to move or euthanize any ill, injured or fatigued animals that may be on the truck.
Moving an Ill, Injured or Fatigued Pig for Treatment, Rest or Recovery

- Based on federal regulation, it is strictly prohibited to move pigs overtop of non-ambulatory pigs. Non-ambulatory or dead pigs must be protected or moved out of the way first. It is also strictly prohibited for handlers to drag live animals or force them to move.
- Handling methods for moving ill, injured or fatigued pigs should include equipment appropriate for the size, age and condition of the animal. When pigs become too large to be carried in a safe manner, proper tools for moving these animals should be used.
- Efforts should be taken to not exacerbate and/or cause an injury to the animal. From worker safety and animal handling perspectives it is recommended that a minimum of two individuals handle ill, injured or fatigued pigs.

Tools for Moving Ill, Injured or Fatigued Pigs

At the plant, it is appropriate to ask for help if you are using one of the below tools and if safe use requires a second handler.

- Stretchers – A stretcher requires two people to gently roll the animal onto it. Handlers should hold/push at the flank and under the forelegs. To prevent dislocation and bruising the animal's legs should not be held.
- Sleds – Tip the sled onto its side and roll the pig into the sled. A second handler may need to help hold the sled while the pig is rolled into it. The animal is more likely to allow itself to be pulled in the sled if it is lying on its side rather than its stomach. If a pig is rolled onto its stomach it may stand up and jump out of the sled.
- Hand Carts – A cart can be modified with an enlarged platform and back board. The platform is slid under the pig or the pig is rolled onto the platform. The cart can then be tilted back to move the pig. A second handler should be present to assist in loading and steadying the pig on the platform.
- Mechanized Equipment – If a skid-steer loader is used, the pig should be rolled into the bucket using the same techniques previously described. It is recommended that two handlers be used, one to operate the machine and one to roll the pig into the bucket. Loaders should be equipped with a special lid attachment on the bucket to prevent the pig from jumping or falling out. As in all other methods, the pigs must be off-loaded by gently rolling or lifting them out of the bucket. Loading pigs into the bucket using a wall, partition or fence is not acceptable.

Managing Pigs That Arrive Dead at the Plant (DOAs)

- DOA's are identified by the transporter.
- Some packing plants will require that their personnel verify that the animal is insensible.
- Some packing plants will require that they assist with alignment and removal of the DOA.
- Some packing plants will require that they assist movement of the DOA with a hoist system.
- Realize that some packing plants forbid removal of DOA's from side doors and require removal from the tail of the trailer. Other packing plants will require that you move the pigs yourself and that the pig be moved out of pig traffic right away.
- Move DOA's out of the way of pig traffic. Use a leg shackle with a T-bar handle or a pig snare.
  - Severe injury can occur to you if the snare or leg shackle slips off when you are pulling the DOA. Take great care to make sure the snare or shackle is securely placed behind the rear hock of the DOA.
• The snare or shackle is at risk of slipping and creating a situation where you may lose your balance. Handlers have been injured when this occurs. Pull with the perspective that the snare or shackle may slip. Short pulls are safer than great heaves.

• Do not use hooks dug into the flesh of the DOA.

• Once pigs are unloaded, move the DOA to the designated area at the plant. If you must move your truck to reach this area, close the back door.

• Remove the DOA from the lowest point on the trailer if possible.
  • Risk of handler falls is possible when moving DOAs from the top deck.
  • If a DOA must be removed from the top deck, pull the DOA to the door ledge and then push the pig the rest of the way out instead of hoisting the DOA out with the snare or shackle. Debilitating injuries have occurred when DOAs are hoisted ranging from finger loss, to severe falls as the handler works to loosen the snare from the hoisted pig as it is swung out.
  • Consider using two or more people to move a DOA if you cannot safely do it alone.

Summary

**Fitness of the pig:**

• All pigs should be evaluated by a handler for fitness to travel
• Examples of animals that are unfit:
  • Sick, injured, weak, disabled, or fatigued
  • Unable to stand and bear weight on each leg
  • Blind in both eyes
  • Cannot move without causing additional suffering
  • Newborns with an unhealed navel
  • Pregnant animals (final 10% of gestational period at the planned time of unloading)
  • Females traveling without young who have given birth within the past 48 hours
  • Those whose body condition would result in poor welfare because of the expected climatic conditions. This includes sows and boars sent to market.

**There are three primary issues that can lead to increased transport losses:**

• Fatigue
• Heat Stress
• Porcine Stress Syndrome (PSS)

**Managing ill, injured, or fatigued pigs:**

• Handle in a humane manner.
• Prevent illness and injuries (i.e. feeding nutritionally sound diets, handling pigs properly, etc.).
• Provide a resting area to minimize competition for feed and water.
• If ill, injured, or unable to walk during loading, this animal should not be transported to market channels.
• If ill, injured, or unable to walk during transportation and post unloading, this animal should be segregated upon arrival and care given to their special needs. Notify the receiver of any ill, injured, or fatigued animals on the transport vehicle before it is unloaded.
• Never drag a live pig by its ears, legs, or tails. Do not use your foot or in any way force any pig to move.
6. Biosecurity

The Big Picture

The people and companies that transport pigs play an important role in the profitability of the pork industry. Whether it is transporting pigs to harvest or moving pigs between farms, transportation services are vital to the industry today. Contamination of trailers, equipment and clothing/footwear with organic materials, including feces, and other bodily secretions, is a common part of the process. The organic material contains bacteria and viruses that have the ability to cause disease.

Everyone involved in pork production, from producers, their employees, veterinarians and transporters needs to focus on developing a biosecurity plan that will help them make good decisions and take actions that reduce the risk of disease introduction and spread.

True Story:
I’m a veterinarian. My family raises hogs. My brother trucks our hogs to the plants. One day, my brother, being a nice guy, helped another trucker-handler, who was struggling a bit, unload hogs in some hot weather when lines at the plant were longer than normal. He then unloaded our hogs and drove home.

The boots he wore in the other handler’s hog trailer came home as well. Somehow those same boots were used to do evening chores. The evening of the next day, 10 hogs were dead... the following day, 20. Diagnostics shows an extremely pathogenic strain of APP had been introduced. Two years prior we had depopulated our herd to eliminate this disease. The reintroduction was killing pigs within 24 hours of infection.

We injected an entire barn of 2,000 pigs. The third day it spread to the rest of the farm and over 300 pigs were dead or dying. We spent Thanksgiving Day, injecting the entire herd at that site (12,000 hogs) with treatment. Losses were tremendous. Being a veterinarian, I thought we had good biosecurity protocols, but somehow this incident still occurred. We learned our lesson. Review, assess, and crosscheck repeatedly that everyone on the team understands how to prevent disease entry to farms.

The plan begins with everyone understanding that they have a personal responsibility to do their part to maintain herd health, regardless of their role in pork production. All movement of pigs, people, vehicles and equipment on and off a farm provides the opportunity for a disease to infect a herd. The risk for the introduction of a disease to a herd is especially greater when steps to reduce that risk are not taken, or ignored. Those who become complacent represent one of the greatest risks to disease transfer. The more often a risky behavior is done, poor consequence will likely occur.

Diseases of swine can cause significant economic losses to pork producers. Diseases of swine such as Porcine Reproductive and Respiratory Syndrome (PRRS), Transmissible Gastroenteritis (TGE), Porcine Epidemic Diarrhea (PED), Salmonella, Escherichia coli, Dysentery (Brachyspira), Actinobacillus pleuropneumoniae (APP) and Ileitis (Lawsonia) pose a risk for significant losses for an infected farm. Therefore, it is important that your herd health and biosecurity plan includes procedures to minimize disease spread and to reduce the chance of disease introduction, including transportation risks.
The objective of transportation biosecurity is to minimize the risk of disease transfer caused by truck and trailer, driver and associated equipment. This is specifically accomplished through a combination of biosecurity protocols including cleaning, disinfection, and drying of trailers and equipment. Assume any site you contact could transmit disease through you, and/or your tractor and trailer. Ask about any required downtime prior to going to load pigs. All down time requirements should be observed as required by loading and unloading locations. Ask where the Line of Separation is at the site to establish where you can contact the facilities. The Line of Separation is defined as the line between the area that is to be used by the transporter and the area to be used by daily farm personnel. Cover-up with protective gear (boots, coveralls, gloves) to minimize the risk of contamination. Manage any cross-over of the line with protective gear. Dispose of or properly contain any contaminated gear. Clean and disinfect any re-usable gear for the next site. Protect yourself and assume responsibility for the health status of your tractor and trailer.

The incorporation, enforcement and level of biosecurity procedures may differ by farm site and management. The lack of biosecurity protocols does not mean biosecurity should be ignored. You are responsible for the biosecurity of your truck, tractor and all associated equipment. A clean truck, trailer and transporter go a long way toward reducing risk of disease spread and should be considered the best option in the absence of a defined farm plan.

Diseases like to “Hitch a Ride” so separate yourself from “cross contamination”

The pathogens that cause disease in pigs (bacteria, viruses and parasites) can survive in different types of materials. Organic matter (shavings, manure) or water, mud and snow carried on boots, clothing, tires, undercarriages, trailers, shovels, winter panels, sorting panels and people carry pathogens that can infect healthy pigs. Other activities, such as walking into a packing plant or a buying station can be an increased risk for disease spread because boots and trailers can become contaminated with pathogens the farms you serve are trying to keep out. Assume every site you touch is a risk and you do not want to be responsible to transfer this risk. Do not be the source of pathogen transfer wherever you pick up or drop off your loads.

Since pathogens can survive in dirty trailers and equipment for an extended period of time, proper cleaning, disinfection and drying are very critical for the prevention of

---

### Top Costly Diseases of Pigs that YOU and YOUR TRUCK can Transport to a Farm:

**Porcine Reproductive and Respiratory Syndrome (PRRS)**
- Annual cost to the industry = $664 million
- Caused by a virus that can survive in manure, mud and water especially in cold weather
- The virus is very difficult to manage and may include depopulation of an infected herd

**Actinobacillus Pleuropneumonia (APP)**
- Can cause significant death loss in market pigs (as high as 20%)
- Caused by a bacteria that can be transmitted by dirty equipment or snares
- Management/treatment is expensive and can include depopulation of an infected herd

**TGE and PED**
- Diarrheal diseases of pigs that cause significant losses of baby pigs (80-100% mortality) and illness/growth reduction in older animals
- Coronaviruses that can be spread by contaminated equipment, manure and trailers

**Salmonellosis or other enteric bacterial infections**
- Diarrheal and systemic diseases of all ages of pigs caused by bacterial infections – growth reduction and death loss
- Easily survives and is transmitted in manure/contaminated shavings

**Swine dysentery**
- Re-emerging bacterial diarrheal disease of swine
- Caused by Brachyspira that can survive in fecal materials/manure and on contaminated equipment/trailers
- Management/treatment options are expensive and may include herd depopulation

**Foreign Animal Diseases**
- Economically devastating diseases of swine
- FMD (Foot and Mouth Disease) could cost producers millions of lost dollars if found
- Can easily transmit to healthy pigs via contaminated equipment, coveralls/boots and trailers
pathogen spread. Removal of all pig manure and used shavings is a critical first step in the process. Disinfectants are only effective on trailers and equipment that are free of all organic material. Drying is also a very important step to kill bacteria and viruses and helps maximize the benefit of disinfectants. Organisms like PED and TGE can survive in frozen water and still be able to infect a susceptible animal. Therefore, it is very important to remove standing pools of water in a trailer.

Other steps to consider to avoid carrying bacteria or viruses to another location are pest control and clean-up of used equipment and trash. Certain pathogens, like the PRRS virus, can be transmitted through insects. Bug control is an important step to prevent pathogen transmission. Prior to departing from a site, buying station or packing plant, all pests, debris and trash should be removed from the cab.

**Think of Every Site/Stop as Being A Risk to the Biosecurity of Your Vehicle**

One of the primary goals of biosecurity is to prevent a change in a herd’s health status caused by disease introduction. There are many different diseases that can negatively impact pork producers. As part of an overall biosecurity plan, the use of clean and disinfected trucks and trailers and clean drivers help to reduce the risk of disease spread. Listed below are some guidelines and examples of protocols that can be implemented to reduce the risk of disease transfer as pigs are moved during the course of daily operations.

**Basic Guidelines for Load-out Procedures**

**Basic Load-Out Guidelines:**

1. When at the farm to load out pigs, truck drivers and barn personnel should not cross the established Line of Separation without protective gear that can be removed.
   a. If unclear about the Line of Separation, ask! The driver and load-out crew should all understand where this transition point is prior to loading the first animal.
   b. Assume the Line of Separation is at the back door of the trailer unless told otherwise. It may also be at the barn door, the chute entry or a gate. Communication is key to knowing where the driver is allowed to be.
   c. If animals are being loaded for slaughter, farm personnel move the animals up to Line of Separation (not entering the trailer).
   d. The driver handles the loaded animals only after they cross the Line of Separation and they are on the trailer and the unloaded animals only while they are on the trailer before they cross the Line of Separation.
   e. Drivers themselves never cross the Line of Separation.
   f. The farm loading or receiving personnel never cross the Line of Separation.

2. If farm personnel break protocol and cross the Line of Separation, they may only cross back to the other side of the Line of Separation after going through the usual biosecurity protocols to clean and disinfect.
   a. This may consist of a shower in/out or change of clothes/boots and washing of hands.

3. Farm personnel should clean and disinfect the transport/driver side of the load-out area immediately after the transport vehicle has been loaded and pulled away.
   a. Farm personnel then may only cross back to the farm/site side of the Line of Separation after going through basic biosecurity protocols, such as shower in/out or change of clothes/boots and wash of hands.
One Example of Loading or Unloading Biosecurity Protocol:

1. Have available in the cab, clean coveralls, boots, an extra garbage bag and other needed items (gloves, hat, shin-guards etc.) individually organized per load (1 clean set for every load) in a plastic tote or in a clean garbage bag. These may be disposable items for single use.
   a. Put on disposable coveralls/boots prior to exiting the cab when delivering to a packing plant or buying station, (the facility and its biosecurity protocol will determine when you remove these disposable items).
   b. When getting out of the cab, gather one set of clean equipment to be used for that load. Bring the appropriate paperwork for the final animal count and delivery to the customer.
   c. Walk to the back of the trailer or by the side door and place a clean garbage bag or tote lid on the ground directly by the trailer entrance as a barrier between clean footwear and the ground. Place the clean set of clothing, boots and other items such as hat, gloves, etc. on the bag to prevent them from contacting the ground.
   d. While standing beside the bag or tote lid, take off personal shoes and step on the clean bag or tote lid without touching the ground.
   e. Put on coveralls, not allowing coveralls to touch the ground and then put on clean boots from the set you have pulled out. Gather up other items to take with you such as hat, gloves etc.
   f. Step directly from the clean plastic bag or tote lid to the trailer side-door or back door without touching the ground. This establishes the back of the trailer as the Line of Separation.
   g. Animal flow must be one way only. Once an animal leaves the trailer it should never re-enter unless designated otherwise by herd management. During a multi-drop delivery, if an animal re-enters the trailer, the remaining animals are compromised. Contact the herd management if this happens for further direction.
   h. Unload animals, observing the Line of Separation. Finalize the appropriate paperwork and give to the customer before exiting the trailer.
   i. The driver should never cross the Line of Separation and enter the customer facilities.
   j. The customer should never cross the Line of Separation and enter the trailer of the delivery vehicle (or the loading ramp if the ramp is provided with the trailer).
   k. Once finished with animal movements, exit out of the trailer. Step back on to the clean garbage bag or tote lid and place the used coveralls, boots and gloves into the extra garbage bag that is available. Dispose of any additional used items in the garbage bag. Place the garbage bag or tote box into the “dirty” supply box or leave it in the trailer for unloading. Used boots, gloves and coveralls ARE NEVER to be worn in the cab of the truck. Do not leave any debris on the ground at any time.
   l. Inside the cab, clean hands with a towelette or hand sanitizer. Place the towelette in a garbage bag.
   m. Proceed to next drop point or the wash bay.

The goal for any biosecurity option is to maintain a barrier between potentially contaminated pigs/areas and healthy, uninfected pigs. Repeat as needed using a clean set of clothing and boots for each load of animals.
Some additional guidelines to prevent spread of diseases at packing plants or buying stations include:

1. Learn and understand the plant’s specific restrictions for biosecurity before you load or unload animals.
2. In order to avoid contamination of the cab of the tractor when unloading pigs at a packing plant or buying station, take the additional steps of the unloading biosecurity protocol using a garbage bag or tote lid as a barrier between the clean protective wear and the ground.
3. Limit foot traffic on the dock/in the yards and use disposable boots or other methods to maintain biosecurity.
4. Limit foot traffic on plant property outside of yards and use disposable boots or other methods to maintain biosecurity.
5. Do not enter another trucker’s trailer.
6. Use your own equipment (i.e. snares, paddles sort boards). Equipment can carry pathogens, so if you borrow equipment you may be more likely to transmit pathogens.
7. Have clean equipment such as hats, gloves, shin-guards etc. for each load in order to prevent spread of diseases back to a farm, even if the farm is completely depopulating.
8. When finished unloading, remove dirty coveralls and boots and place in a separate garbage bag for disposal.
9. Drivers should disinfect their shoes and the floor mats inside the truck prior to proceeding to the next farm to load pigs.

**Basic Guidelines for Sanitation, Disinfection, Drying and Downtime**

**Cleaning**

Proper cleaning prior to disinfection is a critical step for preventing the introduction of disease on the farm. All equipment including the trailer should be free of visible manure, shavings or dirt prior to disinfection. Different cleaning products and wash soaps are available to help break up the fats and other organic materials and should be reviewed to make sure that they are chemically compatible with each other. The use of wash soap can decrease cleaning time versus just using water. The truck and trailer must be thoroughly cleaned, washed, disinfected and completely dried after being used and before being loaded again. Follow your customer’s protocol for washing, disinfection and dry times to help prevent disease entry.

**Example Trailer Cleaning Protocol**

*Note: Use of hot water for cleaning and sanitation of trailers can be important to optimize the removal of organic materials and to assist in pathogen reduction.

**Before Entering the Wash Bay**

1. Identify the traffic flow for entry and exit of clean and dirty vehicles.
2. The bay must be cleaned before the truck enters.
3. Scrape and sweep all manure, bedding and debris from the cargo area and dispose of according to the wash bay protocols.
In the Wash Bay
1. Remove vehicle trash from truck cab.
2. Allow vehicle to thaw if necessary before washing.
3. Turn on exhaust fan.
4. Put on rubber boots and coveralls.
5. Empty shavings bags, dirty rubber boots, coveralls and gloves and place them in the designated locations (recycle bin, garbage or laundry).
7. When using winter panels pull all panels off of the vehicle.

Washing Process
1. If the tractor remains with the trailer, clean the tractor cab first and then close the doors while washing the trailer and other equipment.
2. Whenever possible, clean the cab using compressed air on seats and water on the floor and pedals.
3. Disinfect the pedals and floor of the cab.
4. Clean other surfaces of the cab (steering wheel, shift lever, door handles, dashboard, etc.) using a clean cloth that is wet with disinfectant solution or disinfectant wipes.
5. Apply a pyrethrin insecticide inside the cab to kill any insects and close the tractor cab doors.
6. Thoroughly rinse the interior cargo area free of manure and shavings (rinse both decks even if both were not used).
7. Apply soap according to label directions, to all interior surfaces of pig space, working from the floor up.
8. Then, apply soap to the exterior of the trailer and the truck, including the trailer boxes.
9. Do not let the detergent dry on any surface.
10. Working from the top going down, high-pressure wash the exterior of the trailer and truck first, then the trailer interior, including ramps, gates, crowd boards, brooms, shovels, dirty and clean boxes and both sides of any winter panels.
11. Apply disinfectant, (see Appendix A), to all exterior surfaces and then apply to interior surfaces of the cargo area including ramps, gates, crowd boards, brooms, shovels, dirty and clean boxes and both sides of any winter panels.
12. Allow the appropriate contact time per instructions on the disinfectant bottle (usually 10-20 min.).
13. Before entering the cab to move the unit, remove the rubber boots and coveralls you are wearing and place in designated location or dirty box. Don’t carry or place anything back into the truck.

After Washing
1. Park the trailer on a slope to drain off excess standing water.
2. Use heat assisted drying where possible.
3. If heat assisted drying is not available, the use of circulating fans can assist in the drying process.
**Final Items**

1. Rinse and disinfect the hoses and floor of the wash bay area.
2. Return the hoses to the appropriate locations.
3. Turn fan off.
4. Change out of coveralls and place in dirty laundry.

**Disinfection**

Disinfectants should be used on trucks and trailers after they have been cleaned because organic materials will inactivate and reduce the effectiveness of most disinfectants. Disinfectants should also be chemically compatible with any cleaning product or wash soap that is being used. Different chemicals can either reduce the effectiveness of the disinfectant or produce a harmful chemical reaction when combined. It is also essential to follow label directions when using disinfectants to ensure the disinfectant is being used at the proper concentration, temperature and the appropriate contact times are being observed. Failure to select and use disinfectants properly will decrease their effectiveness in disease prevention and can pose a risk to human health.

**Drying and Heat**

Drying helps support the inactivation of disease agents. Heat delivered to a trailer at the appropriate temperature and over the right period of time can be effective against many swine diseases. Trucks and trailers should be cleaned, disinfected and allowed to dry completely before being loaded with a new group of pigs.

**Summary**

In summary, everyone involved in pork production -- producers and their employees, veterinarians and transporters -- needs to focus on developing a biosecurity plan that will help them make good decisions and take actions that reduce the risk of disease introduction and spread.

All stakeholders involved in pork production -- producers and their employees, veterinarians, and transporters -- need to develop and implement a biosecurity plan:

- Many diseases of swine can cause substantial financial losses. Many of these diseases are readily transmitted during transportation.
- Understand the individual responsibility for herd health. Know the Line of Separation on each site where you pick up and drop off.
- Practice and perform appropriate biosecurity procedures. Be prepared to cover up, contain and clean your equipment and self when interacting with sites and their Line of Separation.
- Follow biosecurity protocols for transportation (i.e. downtime, proper cleaning of truck prior to disinfection, disinfection, drying and heat, etc.).
Resources
Resources pertaining to biosecurity and livestock production can be found online at pork.org and at the National Biosecurity Resource Center at biosecuritycenter.org where transporters can find guidance on boot disinfection; actively search for disinfectants by manufacturer, disinfectant class or by disease; and locate truck washes by state. Additional information on biosecurity and disinfectants can be found online at Iowa State Center for Food Security and Public Health at cfsph.iastate.edu and online at the University of Minnesota Swine Disease Eradication Center at cvm.edu/sdec.

Additional resources:
Swine Health/Biosecurity Resources and Fact Sheets: www.pork.org/PED
Biosecurity Guide for Pork Producers: www.biosecuritycenter.org
Biosecurity for Today’s Swine Operation: extension.missouri.edu/p/G2340
Secure Food Supply Plans: www.cfsph.iastate.edu/Secure-Food-Supply/index.php
Production Animal Disease Risk Assessment Program Resources (PADRAP): vdpambi.vdl.iastate.edu/padrap/pages/resources.aspx
PEDV Viral Stability and Disinfectant Use as Compared to TGEV and PRRSV; University of Minnesota, Swine Disease Eradication Center: www.cvm.umn.edu/sdec
Biosecurity of Pigs and Farm Security, University of Nebraska Lincoln, Extension EC289: www.ianrpubs.unl.edu/sendlt/ec289.pdf
7. Emergency Response Plan

Even though the goal of each transporter is to get the animals to their destination safely and in a timely manner, risk factors do exist with each load transported. Transporters not only must make themselves aware of these risk factors, they also must have a plan in place to deal with them if they should occur. By being prepared, the transporter will be able to respond in an effective manner and lessen the impact of the delay or accident on the animals and on themselves.

Transporter’s Responsibilities in an Emergency

Even in the event of an emergency, transporters have a responsibility toward the animals, the company and the U.S. pork industry. These responsibilities include:

• Being aware and prepared to handle emergencies
• Ensuring the transporter’s personal safety and an awareness of public safety
• Responding to the situation professionally
• The well-being and humane treatment of the animals
• The protection of company property (e.g. the animals, equipment)
• Projecting a positive perception of the company and the industry
• Practicing safe handling of animals for emergency prevention

Emergency Plans for Delays

Ideally, pigs will arrive at their destination in a timely manner with minimal added stress. Unfortunately, during the movement of pigs, many situations can arise that can cause a load to be delayed. These delays can include: weather, traffic issues, motor vehicle accidents, road construction, mechanical breakdowns or plant shutdowns. Remember, the goal of everyone involved in the scheduling process (producer, transporter, director of procurement and dispatcher) is to minimize the time that pigs must remain on a trailer.

Prevention

Some delays can be avoided if the transporter is prepared ahead of time.

• Investigate the travel route before departure to determine if road construction is in progress.
• Check the weather conditions on the route. Avoid driving during bad weather if possible.
• Perform routine maintenance and inspect the tractor-trailer before each trip keeping all proper records.
  • If there are any mechanical or structural issues, they must be repaired before beginning the trip.
  • If the vehicle has just returned from repair, ensure all repairs were performed adequately.
• Avoid rush-hour traffic when possible.
• Listen to local radio stations and CB radios for traffic and road conditions along the route.

If approached by the media for an interview, refer them to the first responder in charge of the accident. The transporter must remember that at this point, he or she is the most visible representative of the company and pork industry and that the transporter should conduct himself or herself as such.
Preparedness

All transporters need to be prepared for what they will do in each of the situations listed previously. Preparedness may not only help avoid a delay, but may also shorten the length of an unavoidable one.

- Establish and understand company policy of what to do in the case of a delay.
- Become familiar with alternate routes in case of traffic delays or road construction.
- Have the contact numbers for the destination (e.g., plant, farm).
- Have tools/parts available on the truck to repair minor mechanical problems.
- Identify locations and contact numbers for auctions and fairgrounds located along the transport route where pigs could be unloaded during an emergency.

If a delay occurs

- The well-being and safety of the animals must be considered at all times. It is the transporter’s responsibility to do his or her best to keep the animals comfortable and safe.
- During any delay, the transporter must constantly monitor the comfort and condition of the pigs.
- Animals must be protected from extreme weather conditions. In cold weather, when possible, the trailer should be parked in an area that provides protection from the wind. Extra weather boards should be added, if necessary and if available, to keep wind or freezing rain off pigs. In high temperature conditions, when possible, the trailer should be parked in an area that provides shade and allows for a breeze to pass through the sides of the trailer. If water is available, wet the pigs to keep them cool. If water is unavailable and weather conditions require wetting of the pigs, the transporter may be able to contact the local fire department to have them come and wet the pigs with water from a fire truck.
- The transporter should contact the origination and the destination contact to inform them of the nature of the delay and determine the best plan of action for themselves and for the well-being of the animals.
- In the case of a mechanical breakdown of the tractor, determine the nature of the breakdown and estimate how long the repairs will take. If the repairs cannot take place at the site of the breakdown or if they will take an extended period of time, arrange for another tractor to be sent to take the trailer. Numerous factors need to be taken into consideration when determining how long pigs can safely be left on a stationary trailer:
  - Weather – (e.g., Pigs will do fine on a trailer for four hours in cool, low humidity weather. In extreme summer heat and humidity, they will experience heat stress quite quickly.) See Chapter 3 for the livestock weather safety index
  - Fitness of the animals
  - Age of animals
  - Availability of resources for livestock health (e.g., food, water, shade)
  - Location of the delay (e.g., rural area vs. freeway)
  - Time of day
  - Safety of animals at current location (e.g., freeway, truck stop, etc.)
- If the problem is with the trailer, or if the unit is a straight truck, and it cannot be repaired on the road, the pigs must be transferred to another unit to complete the journey. There are several considerations when transferring animals to another trailer:
• Assess the safety of the location. If it is a heavy-traffic area or on a narrow road, have the unit towed to a safe area for transfer if possible.

• Consider whether another semi-trailer can maneuver close enough to do an end-to-end load or will a portable loading ramp be needed requiring the pigs to be off-loaded into an open area and then reloaded. There may be circumstances where only smaller stock trailers can get to the disabled unit.

• If the pigs must be off-loaded and reloaded, ensure proper containment is available to hold the pigs between trailers.

• Before any action takes place, call the local police or fire department for assistance with traffic.

• In the instance of plant shutdowns:
  • Keep in contact with the plant dispatcher.
  • The processor will most likely communicate to producers and transporters that they need to postpone deliveries and prevent long waits at the plant when possible.
  • In most instances, the plant may provide guidance as well as equipment to keep loaded pigs as comfortable as possible.
  • The length of the plant shutdown will help determine the appropriate course of action.
  • For questionable shutdown time spans, create an emergency plan:
    • Locate the nearest location for unloading along the truck route.
    • Locate nearest resource for food and water.

• In the case of road construction, the transporter should investigate if there are any alternate routes. If there is concern about the well-being of the pigs, the transporter should contact the local authorities and explain the animal situation in an attempt to gain permission to move through or receive assistance to turn around.

• If the delay is caused by bad weather or poor road conditions, the truck should be pulled over in a safe area, preferably where the animals will be protected from as much of the weather as possible. The transporter should park the truck as far away from other traffic as possible to reduce the risk of other vehicles hitting the unit.

Accidents

Unfortunately, motor vehicle accidents involving livestock do happen. These incidents are extremely dangerous and stressful for transporters, first responders and the animals. By being prepared for an accident before it happens, and understanding how to effectively respond to an incident involving livestock, the well-being and safety of all involved will improve dramatically. Economic losses can also be greatly reduced when everyone involved is prepared for an accident and they are able to respond in an efficient and effective manner.

Accident Prevention

Due to weather conditions, plant scheduling, transporter shortages and relocation distances, it is often necessary for livestock to be moved during the late evening and early morning hours. Road accident numbers have shown that though there are fewer transporters on the road between

<table>
<thead>
<tr>
<th>Commercial Livestock Transportation Accident Statistics41</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 59% of accidents occurred between midnight and 9AM.</td>
</tr>
<tr>
<td>• 27% of the accidents documented were swine. Of these,</td>
</tr>
<tr>
<td>• 80% involved finished/market pigs</td>
</tr>
<tr>
<td>• 84% of the trailers rolled on the right-hand side</td>
</tr>
<tr>
<td>• 80% were single-vehicle accidents</td>
</tr>
<tr>
<td>• 85% were caused by transporter error</td>
</tr>
</tbody>
</table>
midnight and 6 a.m., transporters are more likely to have accidents during this time period. Additionally, a study in Australia showed that fatigue is more of a problem on country roads, than towns or cities. Other accident causes include transporter distractions, speed/poor driving habits and inadequate vehicle maintenance.

**Preventing Transporter Fatigue**

*Fatigue management is the responsibility of both the transporter and management. In order to manage fatigue, it must first be understood.*

Fatigue is defined by the loss of alertness (slower reflexes), drowsiness (feeling sleepy), falling asleep, poor memory and irritability (more reactive). It is caused by body-clock conflict, poor sleep patterns, long work hours and poor-health factors.

**The following tips can help to prevent fatigue:**

1. Ensure sufficient sleep is obtained each day. Seven and one-half hours is commonly recognized as the normal amount of required sleep. A short night’s sleep should be made up for the next night by sleeping a little longer. Transporters should work with management to provide a schedule that allows for the proper amount of sleep. The only cure for fatigue is sleep.

2. Ensure a good sleep environment at home. Keep rooms cool, turn off the phone, wear earplugs and block out daylight with dark shades or a sleep mask.

3. Stick to regular sleep and wake periods – even on days off.

4. Eat a balanced diet and have regular meal times. Drink plenty of water and exercise. Regular medical check-ups are important.

5. If a transporter feels too drowsy to drive, he/she should pull over and contact the dispatcher and/or the plant to inform them of the situation.

6. If feeling drowsy, take frequent breaks to stop and stretch for 5 minutes. This is also a good time to do a quick check of the animals on board.

7. Do not take over-the-counter stimulants to ease drowsiness.

8. Keep the truck cab comfortable, but not too warm. Heat may make a person feel tired. Allow fresh air into the cab and turn on the radio or play music.

9. Learn to recognize the signs of fatigue:
   - Cannot keep head up
   - Eyes won’t stay open or go out of focus
   - Drift over the center line or the shoulder line
   - Thoughts wander
   - Miss a road sign, exit or a gear
   - Don’t remember passing certain landmarks or towns
   - See things that are not there
   - Reflexes begin to slow
**Speed and Careless Driving**

- Speed must be monitored at all times. Posted speed limits should be observed and speeds adjusted for current road, weather and traffic conditions.
- Do not tailgate, play road games with other transporters, pass illegally or attempt to beat traffic lights or railroad crossings.
- A transporter must always be aware of the hazards of driving on farm roads as they are often narrow, with soft shoulders that may collapse under the weight of a heavy truck. Do not allow the truck or trailer to get too close to the edge of the ditch while driving down the road or turning in or out of driveways.
- Erratic driving and cornering at high speeds can cause the animals to shift. This shift in weight can cause the trailer to tip. Extra caution should be taken on highway entrance and exit ramps.

**Transporter Distractions**

Distractions must be avoided at all times. This includes, but is not limited to, eating, drinking, talking on the phone, reading, texting and reaching for items on the floor or across the seat. Abiding by a one-touch policy to send or receive phone calls can help to reduce distraction. Due to the increasing information on the dangers of distractions by way of cell phones, a hands-free policy is promoted. It is recommended that drivers utilize Bluetooth technology, a hands-free media device that allows the use of cell phones while keeping your hands on the wheel, and your eyes on the road.

<table>
<thead>
<tr>
<th>Risk Increases of Cell Phone Tasks by Heavy Vehicles/Trucks*43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Phone Task</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Dialing Cell Phone</td>
</tr>
<tr>
<td>Talking/Listening</td>
</tr>
<tr>
<td>Use/Reach for electronic device</td>
</tr>
<tr>
<td>Text messaging</td>
</tr>
</tbody>
</table>

**Texting While Driving**

Text messaging requires visual, manual, and cognitive attentions from the driver and leads to increased distraction behind the wheel of a moving vehicle. It is illegal to text message while operating a commercial truck. This also includes voice to text. According to a recent study, drivers are 23 times more likely to be involved in a crash when texting while driving than those who were not texting while driving. Sending or receiving a text takes a driver’s eyes from the road for an average of 4.6 seconds, the equivalent - at 55 mph - of driving the length of an entire football field, blind.

**What does this mean for me?**

Being cited for texting while driving will cost you a fine as well as the right to your job.
Preparation

In order to be properly prepared for an accident, each transport vehicle should contain:

- Emergency contact sheet with 24-hour phone numbers for dispatch, destination point, and insurance companies
- Emergency warning devices (e.g. flares, emergency triangles)
- Camera
- Accident information sheet
- Company accident policy sheet/ Standard Operating Procedures, if one exists
- Fire extinguisher
- Spill kit

In the Event of an Accident

If uninjured and able to do so, the transporter should:

1. Call 911 if the accident occurs on a public roadway or if emergency assistance is required for an on-farm accident. Advise operator of:
   - The location of the accident
   - The fact that you have animals on-board
   - The status of any loose animals
   - Any known hazards

2. Set out emergency warning devices within 10 minutes of accident.

3. Call the designated company contact. If the company has a dispatch checklist for accidents, proceed through list. If not, inform the dispatcher of the location of the accident, if there are any injuries, condition of animals, position of trailer, number of vehicles involved and if first responders are on scene yet.

4. Call other designated contacts according to company protocol. These could include but are not limited to the insurance companies for the cargo and the vehicle and the destination, and provide them with the same information.

5. If the tractor and/or trailer are damaged and unable to move, proceed to point 6 in this list. If damage is minor, the trailer is upright and there are no injuries, take photos and record names and addresses of other people involved and witnesses.

6. Herd any loose pigs from the road and gather them in an area as far away from traffic as possible.

7. Locate accident reporting kit and camera. Take photos of accident as soon as possible. Photographs should include photos of road conditions, vehicle damage, trailer position, the overall accident scene, skid marks, curves, intersections and where the vehicle left the road (if it did).

8. Provide as much protection and comfort for the animals as possible.

9. If approached by the media for an interview, refer them to the first responder in charge of the accident. The transporter must remember that at this point, he or she is the most visible representative of the company and pork industry and that the transporter should conduct himself or herself as such.

10. When first responders arrive, the transporter should advise them of accident details including any human injuries, the status of any loose animals, any known hazards and the company's emergency response plan. If available, the transporter should let the authorities know if a company rescue trailer and animal handling personnel are on the way and their estimated time of arrival. Transporters must respect the chain of command at all times.
Emergency Contact Sheet Example

<table>
<thead>
<tr>
<th>Police</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>911</td>
</tr>
<tr>
<td>Ambulance</td>
<td>911</td>
</tr>
<tr>
<td>Company Dispatch</td>
<td></td>
</tr>
<tr>
<td>24-Hour Accident/Emergency Line</td>
<td></td>
</tr>
<tr>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Other Common Destination</td>
<td></td>
</tr>
<tr>
<td>Insurance Company</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

911 is a standard service nearly everywhere and will typically result in faster service than calling the police, fire or an ambulance directly.

Summary

**Emergency Response Plan:**
- In an event of an emergency, transporters should understand the following responsibilities:
  - Being aware and prepared to handle emergencies
  - Ensuring the transporter's personal safety and an awareness of public safety
  - Responding to the situation professionally
  - The well-being and humane treatment of the animals
  - The protection of company property (e.g. the animals, equipment)
  - Projecting a positive perception of the company and the industry
  - Practice safe handling of animals for emergency prevention

**Emergency plans:**
- If delayed (weather, traffic, etc.), minimize the time the pigs must remain on a trailer.
  - Prepare ahead of time so some delays can be avoided.
  - During any delay, constantly monitor the comfort and condition of the pigs.
  - Contact the origination and the destination contacts to inform them of the nature of the delay and determine the best plan of action.
  - In the case of a mechanical breakdown, determine the nature of the breakdown and estimate how long the repairs will take. If the repairs cannot take place at the site of the breakdown or if they will take an extended period of time, arrange for another tractor to be sent to take the trailer or transfer the animals to another trailer to complete the journey.
  - If plant has been shut down, contact the plant dispatcher to determine the appropriate course of action.
  - Be prepared for accidents before they happen (i.e. get enough sleep, monitor speed and driving, avoid distractions, etc.). Have the following items:
    - Emergency contact sheet with 24-hour phone numbers for dispatch, destination point, and insurance companies
    - Emergency warning devices (e.g. flares, emergency triangles)
    - Camera
    - Accident information sheet
    - Company accident policy sheet/Standard Operating Procedures, if one exists
    - Fire extinguisher
    - Spill kit
  - Call 911 if the accident occurs on a public roadway or if emergency assistance is required.
8. Laws, Regulations, & Audits

Packers and dealers have disciplinary actions for transporters and animal handlers regarding the following state and federal regulations. It is important that you understand what the plant expects of you so you do not break the law and receive the associated disciplinary action.

**Humane Methods of Slaughter Act**

The following list contains a few of pertinent sections of the Humane Methods of Slaughter Act as described by the regulations in 9 CFR 313.45

**Sec. 313.1 Livestock pens, driveways and ramps.**

(a) Livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals. Loose boards, splintered or broken planking, and unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired.

(b) Floors of livestock pens, ramps, and driveways shall be constructed and maintained so as to provide good footing for livestock. Slip-resistant or waffled-floor surfaces, cleated ramps and the use of sand, as appropriate, during winter months are examples of acceptable construction and maintenance.

(c) U.S. Suspects (as defined in §301.2(xxx)) and dying, diseased, and disabled livestock (as defined in §301.2(y)) shall be provided with a covered pen sufficient, in the opinion of the inspector, to protect them from the adverse climatic conditions of the locale while awaiting disposition by the inspector.

(d) Livestock pens and driveways shall be so arranged that sharp corners and direction reversal of driven animals are minimized.

**Sec. 313.2 Handling of livestock.**

(a) Driving of livestock from the unloading ramps to the holding pens and from the holding pens to the stunning area shall be done with a minimum of excitement and discomfort to the animals. Livestock shall not be forced to move faster than a normal walking speed.

(b) Electric prods, canvas slappers, or other implements employed to drive animals shall be used as little as possible in order to minimize excitement and injury. Any use of such implements which, in the opinion of the inspector, is excessive, is prohibited. Electrical prods attached to AC house current shall be reduced by a transformer to the lowest effective voltage not to exceed 50 volts AC.

(c) Pipes, sharp or pointed objects, and other items which, in the opinion of the inspector, would cause injury or unnecessary pain to the animal shall not be used to drive livestock.

(d) Disabled livestock and other animals unable to move.

1. Disabled animals and other animals unable to move shall be separated from normal ambulatory animals and placed in the covered pen provided for in Sec. 313.1(c).

2. The dragging of disabled animals and other animals unable to move, while conscious, is prohibited. Stunned animals may, however, be dragged.

3. Disabled animals and other animals unable to move may be moved, while conscious, on equipment suitable for such purposes; e.g., stone boats.
Sec. 313.50 Tagging of equipment, alleyways, pens, or compartments to prevent inhumane slaughter or handling in connection with slaughter.

When an inspector observes an incident of inhumane slaughter or handling in connection with slaughter, he/she shall inform the establishment operator of the incident and request that the operator take the necessary steps to prevent a recurrence. If the establishment operator fails to take such action or fails to promptly provide the inspector with satisfactory assurances that such action will be taken, the inspector shall follow the procedures specified in paragraph (a) or (b) of this section, as appropriate.

(a) If the cause of inhumane treatment is the result of facility deficiencies, disrepair, or equipment breakdown, the inspector shall attach a “U.S. Rejected” tag thereto. No equipment, alleyway, pen or compartment so tagged shall be used until made acceptable to the inspector. The tag shall not be removed by anyone other than an inspector. All livestock slaughtered prior to such tagging may be dressed, processed, or prepared under inspection.

(b) If the cause of inhumane treatment is the result of establishment employee actions in the handling or moving of livestock, the inspector shall attach a “U.S. Rejected” tag to the alleyways leading to the stunning area. After the tagging of the alleyway, no more livestock shall be moved to the stunning area until the inspector receives satisfactory assurances from the establishment operator that there will not be a recurrence. The tag shall not be removed by anyone other than an inspector. All livestock slaughtered prior to the tagging may be dressed, processed, or prepared under inspection.

Once a vehicle carrying pigs enters an official slaughter establishment’s premises, the vehicle is considered to be a part of that establishment’s premises. The animals within that vehicle are to be handled in accordance with section 313.2 of the Humane Methods of Slaughter Act.46

Here are some examples of actions that would be violations of federal and state laws related to swine handling and well-being and that would result in disciplinary action for you.

1. **Excessive physical contact with approved handling equipment on ambulatory or non-ambulatory swine.** This includes aggressive hitting such as bringing driving aid over handler shoulder height, excessive number of contacts per pig, continually using both hands to hold driving aid to cause more physical force.

2. **Using approved handling equipment in a way that deviates from manufacturer’s intentions.** Examples:
   a. Violation of electric prod use policy. See Chapter 2 on proper prod use.
   b. Modifying approved handling equipment in a manner that may cause undue injury to swine, with the intent to use such equipment
   c. Using equipment to poke/prod sensitive areas, i.e.: eyes, ears, nose, rectum, and genitals
   d. Using equipment to hit swine in the face
   e. Throwing equipment in the path of people and/or swine
   f. Overloading dock pens

3. **Improper handling of ambulatory and non-ambulatory swine.** Examples:
   a. Hitting, kicking, pushing swine
   b. Pulling swine by any bodily appendage: ears, tail, head, legs, etc.
c. Intentionally driving swine too many at a time/too fast, causing excessive piling/vocalization of swine
d. Intentionally driving ambulatory swine over non-ambulatory and dead swine
e. Spraying swine in the face with water

4. **Running equipment over sensible or insensible swine for any reason.** Examples of equipment that may be involved in this type of situation are trucks, trailers, tires, union loaders.

5. **Physically wounding any sensible swine.** Examples of conditions that may cause wounds are obvious sharp edges in trailer, modified driving aids, marring/wounding swine with malicious intent.

6. **Driving swine off semi-trailers over a drop off without providing adequate unloading equipment.** This includes swine falling to the ground, dropping swine from nose to the belly, trailer not aligned with dock properly and causing swine to catch legs/trip/injure.

7. **Leaving ambulatory and non-ambulatory swine in adverse weather conditions while waiting to unload.** Examples of actions that can eliminate this type of situation:
   a. Water and fans to cool in hot weather
   b. Following facility Emergency Hot Weather Action Plan in hot weather
   c. Bedding and boarding in cold weather

8. **Flagrant and intentional violation of bedding or boarding requirements,** including but not limited to inclement weather (extreme heat/cold, humidity, high winds, heavy rain) resulting in increased DOA and N/A incidences and undue stress and discomfort to the swine.

9. **Flagrant and intentional violation of Emergency Action Plan.**

10. **Intentional misrepresentation of identity** with TQA status or driver's license.

11. **Delivering while under suspension or termination.** If a transporter is under suspension or termination, he/she will not be allowed to deliver swine to or physically enter a packer facility for a predetermined time frame. If a suspended/terminated transporter delivers swine to a packer or enters packer property, the swine will be off-loaded by plant personnel at the facility and the transporter will be reminded of his/her suspension status and asked to leave packer property immediately.

12. **Trailer in poor repair, faulty mechanical condition, or damaged equipment.** Examples of conditions resulting in violations:
   a. Worn tread plate/holes in flooring
   b. Sharp edges on side wall structure, ramps, rails, gates, etc.
   c. Faulty gate and door locks
   d. No/improper interior trailer lighting when applicable
   e. Faulty/unstable ramps

13. **Overcrowding trailers.**
   a. Exceeding stocking density regulations in normal weather
   b. Exceeding stocking density regulations in inclement weather (hot or cold), resulting in extreme vocalization, piling, heat stress, frost bite, N/A’s and DOA's

14. **Intentional disregard for delivery schedules.**
15. **Failure to comply with the following packer requirements:**
   a. Age Restriction Policy – no children
   b. Cell Phone Usage/Recording Device Policy
   c. Emergency Operating Plan
   d. Motor Vehicle Operation – following posted speed limits

16. **Rude/abrupt behavior or language that does result in fear or the intent to cause bodily harm/injury.** This is subject to the interpretation of the packer.

17. **Any other condition, just cause, or action that intentionally causes unnecessary pain and suffering to swine, including situations on truck and interactions with packer employees, any guest on packer property, security personnel.**

Transporters must understand and follow laws and regulations governed by federal, state and local authorities including the Department of Transportation (DOT), Food Safety and Inspection Service (FSIS) and United States Department of Agriculture (USDA) and state animal cruelty laws.

**Disciplinary Actions at the Plant**

**EXAMPLE of actions taken by a packer if the above violations occur:**

The following actions will be taken in the occurrence of these violations:

a. Packer will allow unloading if it is in the best interest of swine well-being.

b. If the packer believes unloading swine is not in the best interest of swine well-being, the truck will not be allowed to enter packer property.

c. Transporting privileges of driver may be temporarily suspended or terminated in either instance. The transport company will be notified of the violation.

**Transportation of Animals: 28-hour Law**

The following list contains a few pertinent sections of the Transportation of Animals statute from the U.S. Code that deals with the maximum time animals may be held in a transport vehicle without being unloaded for food, water and rest. 49 USC Sec. 80502.

**Sec. 80502**

(a) **Confinement.**

1. Except as provided in this section, a rail carrier, express carrier, or common carrier (except by air or water), a receiver, trustee, or lessee of one of those carriers, or an owner or master of a vessel transporting animals from a place in a State, the District of Columbia, or a territory or possession of the United States through or to a place in another State, the District of Columbia, or a territory or possession, may not confine animals in a vehicle or vessel for more than 28 consecutive hours without unloading the animals for feeding, water, and rest.

2. Time spent in loading and unloading animals is not included as part of a period of confinement under this subsection.

(b) **Unloading, Feeding, Watering and Rest.**

Animals being transported shall be unloaded in a humane way into pens equipped for feeding, water, and rest for at least 5 consecutive hours. The owner or person having custody of the animals shall feed and water the animals. When the animals are not fed and watered by the owner or person having custody, the rail carrier,
express carrier, or common carrier (except by air or water), the receiver, trustee, or lessee of one of those carriers, or the owner or master of a vessel transporting the animals:

1. Shall feed and water the animals at the reasonable expense of the owner or person having custody, except that the owner or shipper may provide food;
2. Has a lien on the animals for providing food, care, and custody that may be collected at the destination in the same way that a transportation charge is collected; and
3. Is not liable for detaining the animals for a reasonable period to comply with subsection of this section.

(c) Nonapplication.
This section does not apply when animals are transported in a vehicle or vessel in which the animals have food, water, space and an opportunity for rest.

(d) Civil Penalty.
A rail carrier, express carrier, or common carrier (except by air or water), a receiver, trustee, or lessee of one of those carriers, or an owner or master of a vessel that knowingly and willfully violates this section is liable to the United States Government for a civil penalty of at least $100 but not more than $500 for each violation. On learning of a violation, the Attorney General shall bring a civil action to collect the penalty in the district court of the United States for the judicial district in which the violation occurred or the defendant resides or does business.

FSIS inspectors have been instructed to identify livestock that appear exhausted or dehydrated upon arrival. They may ask the transporter or plant to provide documentation of transport duration and compliance with the 28-Hour Law.

**Hours of Service**
Log books should be kept current. You should have enough remaining hours of service to reach the destination and to off load the pigs.

**Harvest Plant Audits**
To help ensure good animal well-being during transport and harvest, pigs must be handled by well-trained people. Given that people can manage what they measure, several auditing systems have been put in place to assess (numerically) if there are people problems, animal problems, or a facility problem.

The North American Meat Institute has developed audit criteria for animal handling and slaughter at the harvest plant. Auditors will evaluate trailers arriving and unloading at the plant as well as animal handling and slaughter in the plant. The criteria that will be evaluated include:

1. Plant transportation policy and preparedness for receiving animals
   a. Plant has written animal welfare policy for transporters
   b. **Plant provides extreme temperature management tools (water, fans, etc.)**
   c. Arrival management process minimizes waiting time at the plant
   d. Emergency plans in place for animals in transit
   e. Written policy for immobile and fatigued animals and tools available for handling
   f. **Acceptable handling tools available and utilized as needed**
   g. Availability of acceptable euthanasia tools
   h. Maintenance records for euthanasia equipment, proper storage and employee training for euthanasia
i. Gates in unloading area swing freely, latch securely and have no sharp protrusions
j. Non-slip flooring
k. Unloading area and ramps in good repair (e.g. no broken cleats, holes or gaps)
l. Adequate lighting
m. Staff available for receiving animals

2. Set-up and Loading of Trailer
   a. Compartments are gated
   b. Trailer loaded at proper density
   c. Incompatible animals segregated when required (e.g. boars and sows)
   d. Trailer properly aligned with the unloading area to prevent extremities from being caught in gaps

3. Timeliness of Arrival of the Truck and Trailers and Animal Unloading
   a. Time between trailer arrival and start of unloading

4. Falls
   a. Counting the number of animals that fall in the unloading area (all four limbs are on the unloading ramp or dock)

5. Electric Prod Use
   a. Measure the number of times an electric prod was used in the unloading area (all four limbs are on the unloading ramp or dock) and the percent of pigs that were shocked

6. Condition of Animal
   a. Tally of non-ambulatory animals
   b. Tally of severely injured animals
   c. Tally of fatigued animals
   d. Tally of frost-bitten animals
   e. Tally of animals farrowing on the trailer
   f. Total percent of all of the above

7. Willful Acts of Abuse – any willful act of abuse/egregious acts is grounds for automatic audit failure. Willful acts of abuse include but are not limited to:
   a. Dragging a conscious, non-ambulatory animal
   b. Intentionally applying prods to sensitive parts of the animal such as eyes, ears, nose, anus or testicles
   c. Deliberate slamming of gates on livestock
   d. Malicious driving of ambulatory livestock on top of one another either manually or with direct contact with motorized equipment. (This excludes use of a bucket loader, or sled for example, to load a non-ambulatory animal for transport
   e. Hitting or beating an animal
   f. Live animals frozen to the floor or sides of the trailer

**Finishing Pig Load-Out Assessment**

The following assessment has been developed for use during finishing pig load-out. It can be used as a tool to help identify areas of improvement in animal handling skills, equipment and facilities, and transport preparation. This assessment begins in the barn just prior to load-out and ends at the farm gate. When completed, any assessment results marked in the shaded boxes should be reviewed and addressed with the drivers and animal handlers.
<table>
<thead>
<tr>
<th>Preparation</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Valid TQA certification for Driver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Driver has the following records in their cab: Emergency action plan Contact info for origination/dispatch Contact info for destination/dispatch Bill of lading Offload/rest plan if to be transported longer than 28 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Load crew is prepared and ready to load at scheduled time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Driver is prepared to load at scheduled time of pick-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Driver knows the scheduled delivery time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Does the driver leave within 15 minutes after loading?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Load crew knows the plan for how to handle pigs that become non-ambulatory in the loading process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. It is predetermined how many pigs (determined by trailer dimensions, pig weight and weather conditions) will be loaded onto the trailer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Driver is aware of biosecurity protocol of the site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilities/Equipment</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>10. Facilities (including alleyway, flooring, chute, and ramp) are in good state of repair so as not to cause injury to the pigs. Comment on areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Trailer (including sides, flooring, ramps and gates) is in good state of repair so as not to cause injury to the pigs. Comment on areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Does the driver have the trailer boarded according to TQA recommendations and plant policy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Does the driver know the plant requirements for boarding and bedding?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Water is available for misting on the trailer if necessary due to weather conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling/Loading</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>15. Pigs are moved at a normal walking pace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Does everyone loading pigs have a panel?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Are electric prods the only handling tool being used? Is the electric prod being used incorrectly? Are electric prods used in the pens?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Are handling tools/equipment used correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Pigs are handled gently (no overuse, or improper use of electric prods; no loud noises and yelling; not moving pigs too fast; not moving too many pigs per group; overcrowding pigs in chutes, ramps and alleyways; and no rough physical contact)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Are any pigs that are unable to walk, are ill or are significantly injured transported to market channels?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Are there areas (i.e. lighting, shadows, contrast, temperature, transitions, wind, etc.) that cause pigs to balk during the loadout process? Comment on areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Do more than 1% of the pigs handled fall during loading? Falling is defined as when a pig loses an upright position suddenly in which part of the body other than the limbs touches the ground.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Transit</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>23. Driver has the ability to adjust trailer ventilation during the journey if necessary (boards are adjustable/removable, plugs are not)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willful Acts of Abuse</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>24. Were any willful acts of abuse observed? Willful abuse is defined as acts outside of normally accepted production practices that intentionally cause pain and suffering including, but not limited to: - prodding in sensitive areas (eyes, ears, genitals, rectum, nose) - dropping or driving live animals from a suspended height - deliberate slamming of gates, doors, etc. on animals - purposeful driving of livestock on top of non-ambulatory or dead animals - malicious hitting/beating an animal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

**Humane Slaughter of Livestock Act:**

- Inspectors are responsible for noting any instances of inhumane slaughter.
- All areas in which livestock are held or transported must remain free of sharp objects and slip-resistant as to prevent injury to the animal.
- Animals should be allowed to walk at a normal pace as not to cause excitement (Electric prods, paddles, or slappers should be used only when encouragement is needed to redirect or elicit movement. Disabled animals should be separated and provided appropriate coverage and weather conditions.)
- Transporters must understand and follow laws and regulations governed by federal, state and local authorities including the Department of Transportation (DOT), Food Safety and Inspection Service (FSIS) and United States Department of Agriculture (USDA).
- The Transportation of Animals statute from the U.S. Code has a 28-hour law that deals with the maximum time animals may be held in a transport vehicle without being unloaded for food, water and rest.

The North American Meat Institute has developed audit criteria for animal handling and slaughter at the harvest plant:

- Auditors will evaluate trailers arriving and unloading at the plant as well as animal handling and slaughter in the plant.
  - Plant transportation policy and preparedness for receiving animals
  - Set-up, loading, and alignment of trailer
  - Timeliness of arrival of the truck and trailers and animal unloading
  - Falls
  - Electric prod use
  - Condition of the animal
  - Willful acts of abuse

Utilize the finishing pig load-put assessment to help identify areas of improvement in animal handling skills, equipment and facilities, and transport preparation:

- The assessment begins in-barn prior to load-out and ends at the farm gate.
- Results in the shaded boxes should be reviewed and addressed with the drivers and animal handlers.
Appendix

√ Preparation

- Fuel, oil and other fluids at appropriate levels
- Truck and trailer lights operational
- Tractor (inside and out) and trailer clean and disinfected
- Vehicle paperwork current including insurance and registration cards
- Load paperwork in order including pick-up and drop-off addresses, directions and telephone contact information
- Weather-appropriate bedding available in trailer
- Water/cooling systems working in trailer (if appropriate)
- Vent holes, nose vents, slots covered/uncovered appropriate for weather
- Trailer in proper repair so as not to cause injury to animals or handlers
- Clothing available for transporter and appropriate for biosecurity conditions
- Phone numbers to contact in case of emergency or delay

√ Loading

- Instructions for entering site/location are known including biosecurity protocols
- Bill of lading
- Health papers (if necessary)
- Truck, cab, trailer clean and disinfected
- Weather conditions accounted for
- Sort board/other handling tools ready and used properly
- Clean boots and clothing available
- Disinfectant available
- Container for dirty clothing and boots
- Loading conditions are safe for handlers and pigs
- Pigs are not crowded during loading or when in the trailer
- Pigs are not allowed back into facility once they enter the chute or truck

√ Unloading

- Instructions for entering site/location are known including biosecurity protocols
- Sort board/other handling tools ready and used properly
- Clean boots and clothing available
- Disinfectant available
- Unloading conditions are safe for handlers and pigs
- Pigs are not crowded when unloaded
- Pigs are not allowed back on the truck once they enter the chute
- Paperwork signed and copies delivered
- Container for dirty clothing and boots

References

1. Content in Chapter 1 unless otherwise cited and indicated sections in Chapter 2 contributed by DNL Farms, LTD.


28. Canadian Agri-Food Research Council. (2001). Recommended code of practice for the
care and handling of farm animals—transportation.


Terms

**Ambulatory**: a pig that is able to stand unaided and can bear weight on each leg.

**Biosecurity**: practices that reduce the risk of disease introduction and spread.

**Dead on Arrival (DOA)**: pigs that die before or upon arrival at the plant.

**Ethical Principles**: U.S. pork producers’ commitment to produce safe food, protect and promote animal well-being, safeguard natural resources in all of their practices, ensure their practices protect public health, provide a work environment that is safe and consistent with their other ethical principles, and contribute to a better quality of life in their communities.

**Euthanasia**: the humane process whereby the pig is rendered insensible, with minimal pain and distress, until death.

**Handler**: Anyone who is in physical contact with a pig and interacts with it in a manner that causes the pig to move. This includes transporters when they are physically moving pigs on foot instead of driving a vehicle.

**Fatigued**: A fatigued pig is defined as having temporarily lost the ability to walk but has a reasonable expectation to recover full locomotion with rest.

**Flight zone**: an imaginary circle around an animal that it considers its individual space.

**Food Safety and Inspection Service (FSIS)**: A branch of the U.S. Department of Agriculture that is responsible for inspecting all pigs and sanitation levels at packing plants.

**Non-ambulatory**: a pig that is unable to stand unaided and bear weight on each leg.

**Point of balance**: is located at a pig’s shoulder. If a handler enters a pig’s flight zone, the pig will move: forward if the handler approaches from behind the point of balance; backwards if the handler approaches from in front of the point of balance.

**Transport losses**: Transport losses refer to those pigs that die (DOA) or become non-ambulatory during handling or transport.

**Transporter**: An individual animal handler who controls a piece of equipment that transports pigs, including truck drivers, tractor drivers using a hog cart, etc.

**We Care® Initiative**: A joint effort of the Pork Checkoff, through the National Pork Board, and the National Pork Producers Council that helps demonstrate that producers are accountable to established ethical principles and animal well-being practices.

**Willful acts of neglect or abuse**: Willful neglect and abuse are defined as acts outside of normally accepted production practices that intentionally cause pain and suffering. This includes, but is not limited to, malicious hitting or beating an animal or using an electric prod in sensitive areas such as eyes, nose, anus, testicles, etc.