

## 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](http://www.weather.gov) or [www.weather.com](http://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.<sup>23</sup> This means that DOAs are most likely to occur June through September and non-ambulatory pigs are most likely to occur September through February.



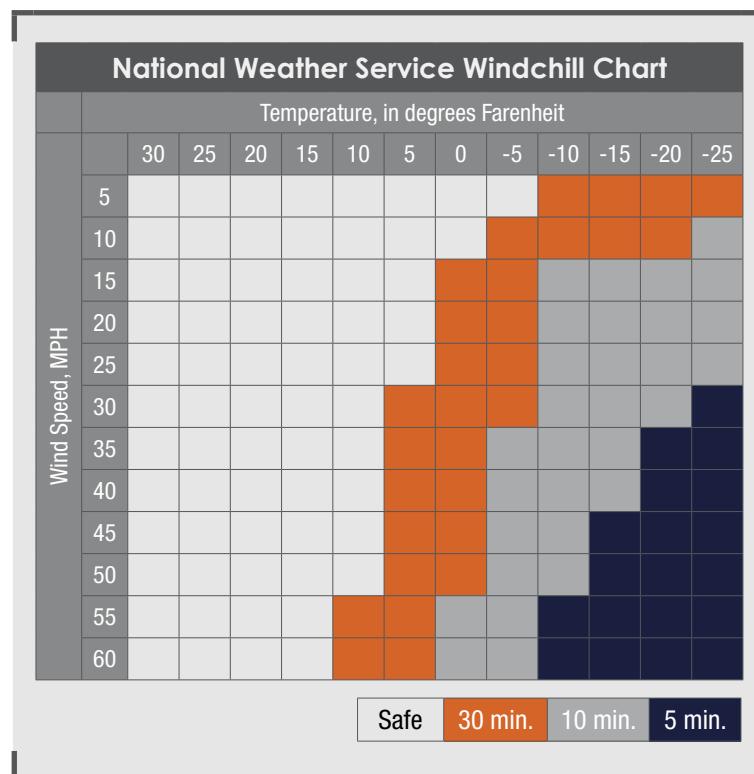
### Cold Weather

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.



**NO  
open vents  
in direct  
contact  
with pigs.**

- 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.<sup>24,25</sup> 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)

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

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



90%  
boarding  
with  
bottom  
covered.



50%  
boarding  
coverage  
evenly  
distributed.



75%  
boarding  
coverage  
evenly  
distributed.



25%  
boarding  
coverage  
evenly  
distributed.

*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.

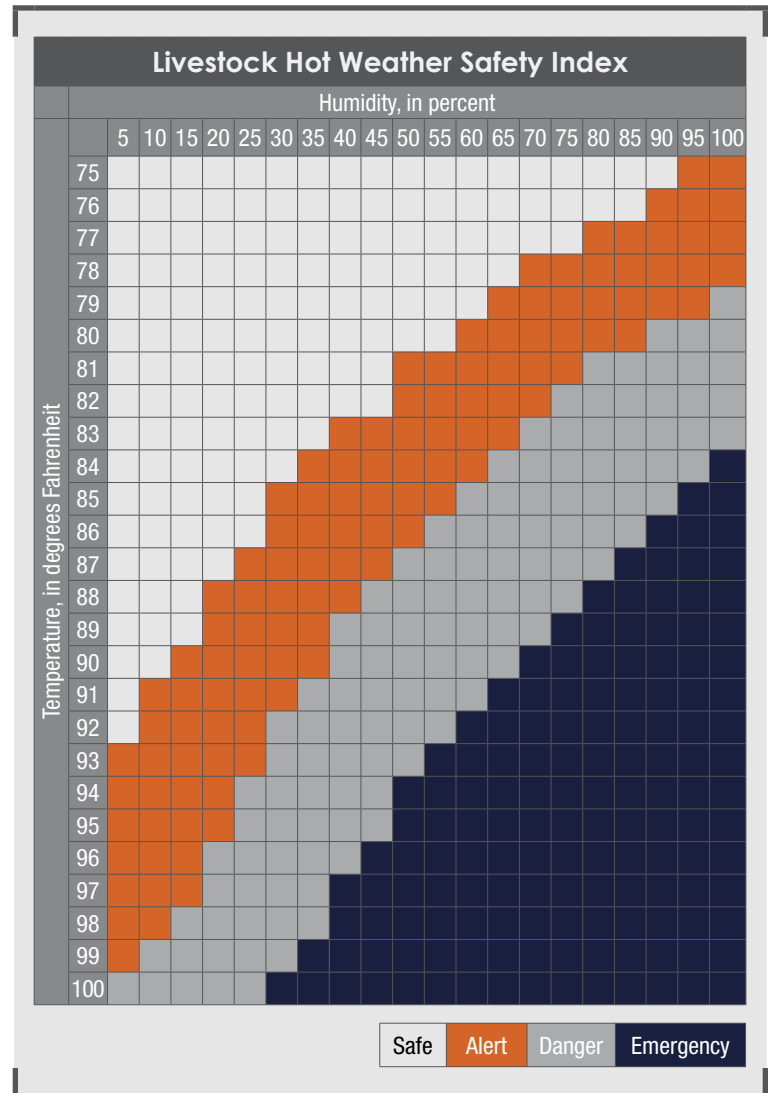
## Hot Weather

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 ft<sup>2</sup>.
- 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.

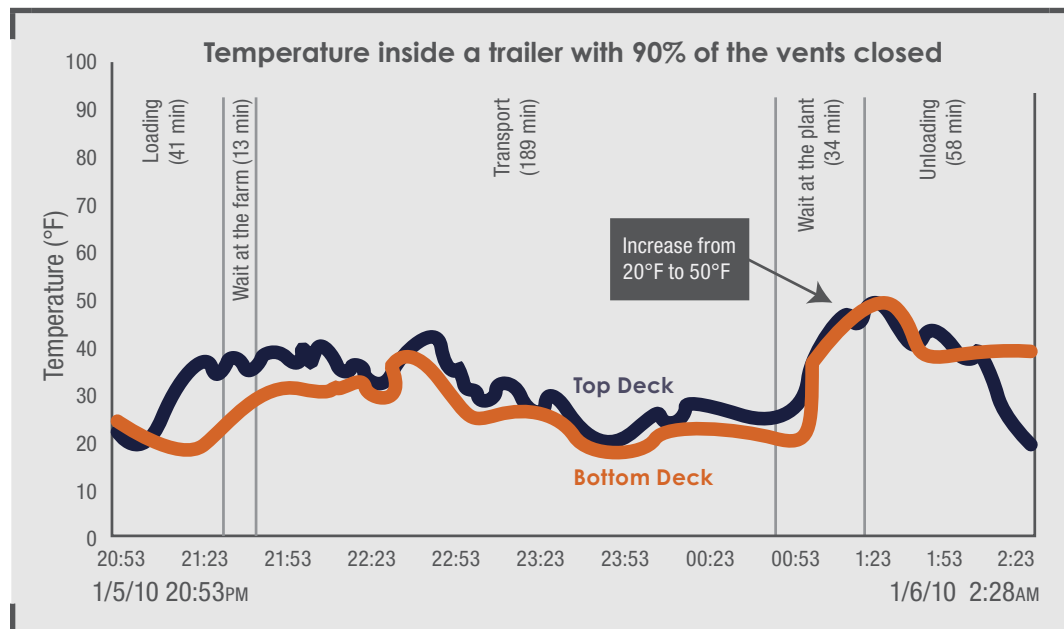


Wetting pigs during transport can be an effective cooling method for high temperatures. The following are guidelines for wetting pigs during hot weather conditions:

- If the temperature is over 80° F (27° C), wet pigs for 5-10 minutes during or after loading.<sup>24,25</sup> 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.<sup>26</sup>

### 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.