

How to reduce heat stress in your pigs

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As warmer weather approaches, producers must be prepared to reduce heat stress in their pigs. Although most swine herds are managed in controlled confinement facilities, it is not always possible to avoid negative effects of high temperatures (above 73.5-77.0 °F) on pig performance. Heat stress is one of the major concerns in pork production during summer because pigs do not have functional sweat glands like other livestock species to assist them in efficiently removing body heat. There are two major ways pigs will use to minimize the effects of heat stress: increased heat dissipation and reduced production of body heat. Pigs will attempt to increase heat dissipation by increasing contact of their body with a cool surface (floor) by sprawling out. Increased respiration, or panting, increases air flow and evaporation of water from the lungs, releasing additional heat. Pigs reduce the amount of body heat generated by reducing feed intake, decreasing activity, and increasing water consumption. As a result, pigs exhibit poor growth rate and feed conversion, reduced milk production during lactation, impaired fertility, and increased mortality rates.

These events occur over a range of temperatures because there are many factors that may influence what the pig may be experiencing as far as temperature. Factors influencing temperature experienced by the pig include: air speed, humidity, group size, surface temperature, building materials, etc.

Minimizing Heat Stress

We cannot control what Mother Nature gives us for weather, but there are a few management strategies that can be implemented to keep pigs performing well. It is important to plan ahead because heat stress can have a great impact on productivity and many times is not noticed until impacts have already occurred.

Respiratory Rate – Increased respiration rate, or panting is the first and one of the most evident signals of heat stress. The frequency of respiration will be raised exponentially when temperatures rise above the animal's comfort zone, so respiratory rate is a good indicator of heat stress. When pigs are under rest condition, rates above 50 respiration movements per minute are indicative of heat stress.

Floor Space – Under conditions of heat stress, it is important to reduce the stocking density in barns as a way to increase the floor space per pig. Increased floor space improves the ability of each pig to lay down in an extended posture to dissipate heat. Keep in mind; pigs fail to lose maximum heat if any of its skin is in contact with other pigs.

Pig Space Requirements

Type of Pig	Weight, lbs	Area, ft ²
Prenursery	12 – 30	2 – 2.5
Nursery	30 – 75	3 – 4
Growing	75 – 150	6
Finishing	150 – market weight	8 - 9

Source: Midwest Plan Service, MWPS-8

Ventilation Systems – Before summer temperatures arrive, it is important to check equipment related to cooling



systems to make sure they are working properly.

Some of these components include: thermostats, fans, air inlets, drip coolers, and sprinklers. The cleaning of all air inlets and fans must be done to make sure they are working properly and to avoid the spread of dust and microorganisms into the barns.

Rapid air movement over pigs increases the rate of evaporative and convective heat loss. Air exchange in mechanically ventilated buildings should be increased in hot weather to increase the removal of humid air from barns.

	Ventilation, cfm/hd		
	Cold Weather Rate	Mild Weather Rate	Hot Weather Rate
Sow & litter	20	80	500
Prenursery pig	2	10	25
Nursery pig	3	15	35
Growing pig	7	24	75
Finishing pig	10	35	120
Gestating sow	12	40	150*
Boar	14	50	300

*300 cfm for gestating sow in a breeding facility

Source: Midwest Plan Service, MWPS-8

Sprinklers – In confinement systems, water sprinklers and drip coolers can provide effective supplemental evaporative cooling. Sprinkler and dripper systems should also be checked to make sure they are working properly. Special attention should be given to leaking sprinklers, since it is necessary to reduce water wastage and excess humidity in the barn.

In group pens, sprinkling water in 1 – 2 minute intervals every 20 – 30 minutes allows moisture to evaporate off the pig's skin before starting the process over again, and is more effective than leaving waterers on continuously. A larger water droplet are the most effective over a fine mist, as misting increases the humidity and reduces the evaporative rate heat loss of the pig.

For sows individually housed in gestation stalls or farrowing crates, dripping water on their necks and shoulders combined with air movement provides direct evaporative cooling. Water drips should be set so water is nearly or completely evaporated before reaching the flooring.

Feed Intake – Pigs will reduce feed consumption when temperatures are above their ideal range in order to reduce the amount of heat being generated due to digestion. Therefore diets should be formulated to be more nutrient dense in the summer, to ensure nutrient needs are being met. One of the best ways to do this is to add supplemental fat to the diet and increase the concentration of other nutrients. The addition of supplemental fat to the diet reduces the amount of heat generated during digestion, and increasing the concentration of other nutrients helps insure that the daily nutrient requirements are met when feed consumption decreases. Other feeding changes that can help alleviate the negative effects of reduced feed intake include: reducing the crude protein content by using synthetic amino acids, addition of water to the dry feed (which may require more labor), and the use of liquid feeding systems. When free choice access to feed is not provided, the ration should be furnished during the coolest periods of day (early morning and late afternoon, or at night).

Water Supply – Pigs under heat stress increase their daily water intake as much as 6 times the level they would consume under optimal temperatures. It is important for pigs to have access to quality water. Waterers need to



be adjusted and functioning properly, with enough waterers available to allow adequate access. It is

important to remember that fresh, good quality water needs to be supplied at free choice.

Additionally, increased water consumption increases urinary excretion and leads to increased excretion of important minerals that are involved in metabolism and electrolyte balance. It may be necessary to make dietary adjustments in the electrolyte balance to replace those losses and obtain the best equilibrium in the metabolism possible. However, this area of nutrition is poorly understood.

Water Requirements

Type of Pig	Water/hd/day, gal	Pigs/Nipple	Min. Nipple Flow Rate, gal/min
Sow & Litter	8	---	1.0
Nursery pig (10 – 45 lbs)	1	10	0.3
Growing pigs (45 – 120 lbs)	3	12 – 15	0.5
Finishing pigs (120 –mkt)	5	12 – 15	0.67
Gestating sow	6	12 – 15	1.0

Source: Midwest Plan Service, MWPS-8

Activity – Any movement demands muscular contraction, resulting in an increase in energy utilization and heat production. So, it is natural for pigs in a hot temperature environment to reduce their activity in order to minimize body heat production. In some cases, the reduction in the frequency of standing up for urination can cause or aggravate urinary infections, leading to fertility problems in sows.

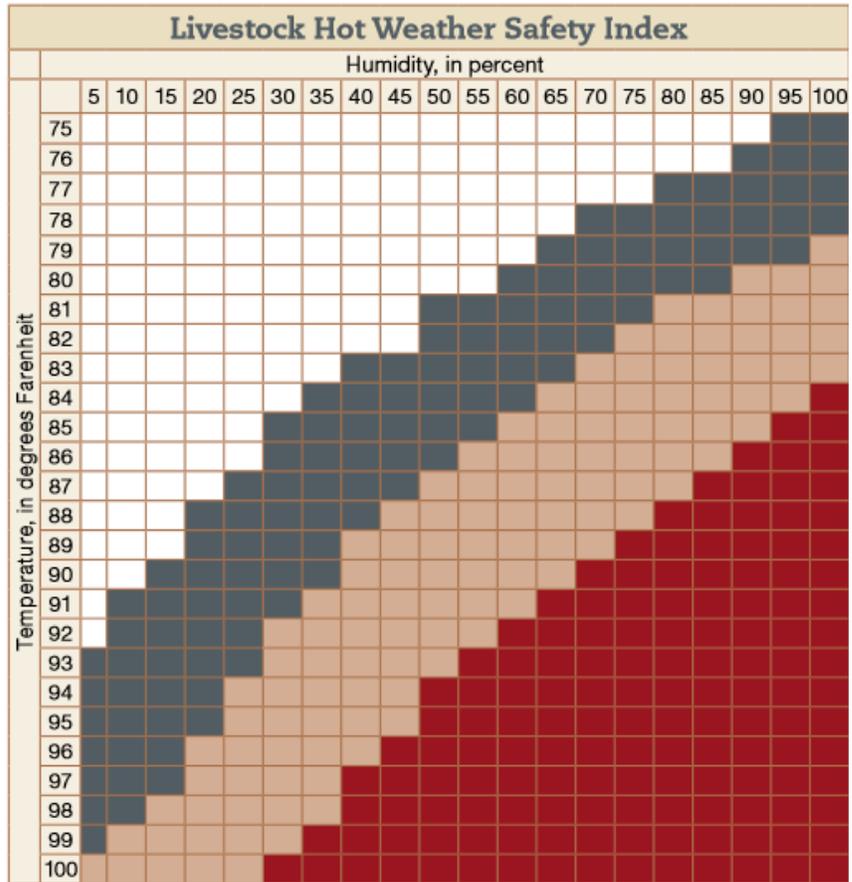


the end of the production process when heat stress is involved.

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 pigs 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 should be taken during the danger and emergency scenarios as outlined previously. This 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 and density, by loading fewer pigs per load
- Schedule transportation early in the morning or at night
- Do not bed pigs with straw in hot weather
- Load and unload promptly to avoid heat buildup
- If the temperature is over 80°F (27°C), wet pigs for 5 – 10 minutes during or after loading. Making sure not to over wet to prevent excess humidity build-up or runoff
- Use a large droplet spray, not a fine mist
- Water should be cold, but be careful NOT to pour large amounts of cold water on an overheated pig as the shock may kill it
- Pigs should be allowed to dry prior to wetting again



Safe Alert Danger Emergency

In summary, it is important to pay attention to the weather forecast. Daily observations of the behavior of your pigs may be the most telling in the heat stress management needed. Planning strategies to protect the herd against higher temperatures, and recognizing the clinical signs of heat stress is needed in order to take the best action to prevent a heat stress situation.