

Day to day management of the pigs and barn are the single greatest factor in differentiating highly productive farms from others. If pigs from the same sow farm (same flow and genetics) went to three different farms, and fed the same diets, each farm would still have different performance outcomes. This is due to the differences in environment and stockmanship at each of the individual farms. With all other factors being equal, pigs are a product of their environment. Their health, growth, and efficiency is dependent on the person taking care of them and the environment within the barn. Careful observation and timely response can make the difference between a group of pigs meeting performance expectations or falling short.

When you walk into a barn to check on the pigs, there are a number of things to look for that if not addressed, could lead to reduced growth performance. These factors include:

Barn Sanitation

Access to quality feed and water

Temperature

Ventilation (air quality, air flow, humidity)

Barn Sanitation

Prior to the first fill of pigs, the barn should be cleaned and allowed adequate time to dry. Numerous studies have found that when pigs are raised in a clean environment compared to a dirty environment they had a 10% improvement in ADG and an 18% improvement in feed intake. The main objective is to decrease the amount of pathogens that can be transmitted between groups of pigs. This can be accomplished by:

- 1) Thoroughly removing organic matter from all surfaces (floor, fences, feeders, waterers, etc.). The presence of organic matter will provide a safe haven for pathogens and decrease the efficacy of disinfectant. The effective removal of visible organic matter can result in a 90% reduction of bacteria from the environment.
- 2) Properly diluting and applying disinfectants.
- 3) Allowing for proper downtime and drying between groups. Viruses can survive in wet environments for an extended period of time compared to dry environments. A study found that the PRRS virus could survive in water for 11 days, whereas it died quickly once it was dry.

Taking the extra time to remove all of the organic matter, properly diluting and applying disinfectant, and allowing the barn to dry completely before loading pigs can result in improvements in gain and feed intake, due to decreased presence of pathogens.

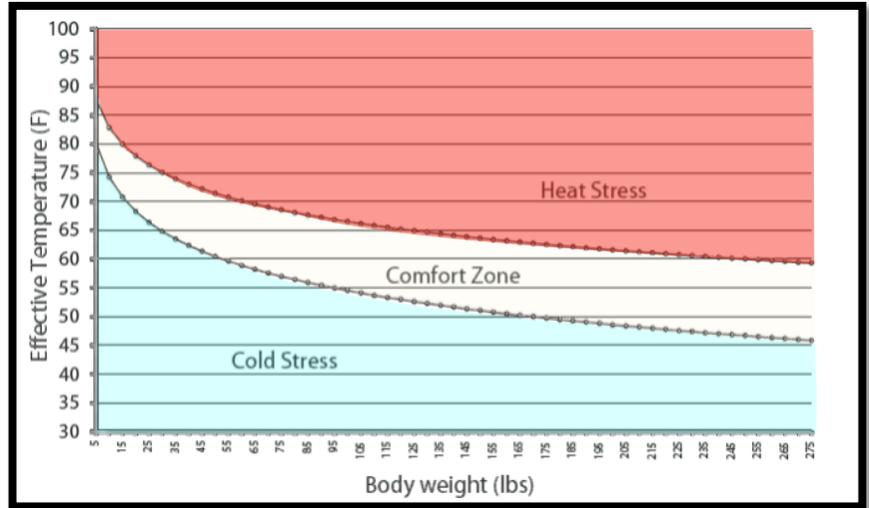
Access to Quality Feed and Water

Uninterrupted access to quality feed and water is essential in reducing stress and maintaining growth performance. Caretakers walking the barns on a daily basis need to check feeders and waterers closely to ensure pigs have access to clean feed and water. The Water Quality and Feeder Management sections of the Hubbard Finisher Management Guide provides more extensive information on these topics.

Optimal Environment

The high lean, fast growing pigs in production today are more susceptible to environmental stress and temperature extremes compared to their predecessors. In order to maintain growth and feed efficiency it is important to ensure that pigs remain within their thermoneutral zone. Once a pig falls outside of that zone they will become stressed and setbacks in performance can be observed.

When pigs are kept at temperatures below their comfort zone they will consume more feed in an effort to maintain their body temperature, resulting in decreased feed efficiency. Conversely, pigs housed at temperatures above their comfort zone will decrease feed intake and daily gains will slow down. In modern swine barns pigs are at a greater risk of experiencing heat stress rather than cold stress. Therefore, it is important to ensure that all fans, sprinklers, cool cells, and other cooling equipment is adequately maintained so that they are properly functioning during the hot summer months.



In conjunction with temperature, it is important that your barn is properly ventilated to provide pigs with an optimal environment. Despite the thermostat reading falling within the pigs comfort zone, it may not actually be the environment that they are experiencing.

Effective temperature is a concept similar to that of wind chill and heat index. For example, 60°F is a favorable temperature for a 125 lb pig. However, 60°F combined with a high air speed (100 ft/min) would be cold, and consequently the pig would be diverting energy from growth to maintaining its body temperature. The chart at the right shows the effects of wind speed on temperature.

Air speed (ft/min)	Temperature adjustment
0	0
30	-7
90	-13
300	-18

On the other hand, the temperature within the barn needs to be adequately adjusted to account for the additional heat production from the growing pig. For every 60-80 lbs of gain, the pig will produce an additional 200 btu/hr of heat. Therefore, CFM's (cubic feet/min) need to be properly adjusted to account for the increasing heat production. Using the chart below, a 1000 head barn averaging 100 lbs in August would require 75,000 CFM. Conversely, if that same 1000 head barn in August housed pigs weighing 250 lbs the required CFM would be 120,000.

Recommended Ventilation Rates, CFM per pig			
Pig Weight, lbs	Minimum	Mild Weather	Hot Weather
30-75 lbs	3	15	45
75-150 lbs	7	24	75
150-280 lbs	10	35	120

Humidity is also an important indicator of proper ventilation. Simply put, humidity is the amount of water vapor in the air. During the winter months, humidity is generally lower due to cooler air having a lower water holding capacity. It is suggested to increase ventilation rates when the outside temperature drops below the set point, in an effort to decrease humidity within the barn. However, during warmer months when outside temperature exceeds the set point, increasing ventilation rates will not decrease humidity within the barn. This is due to warm air having a higher water holding capacity than cooler air. It is recommended to operate at 65% relative humidity or less. This level of humidity will decrease condensation and wet floors within the barn.

Ventilation is also a key player in keeping gases such as ammonia, hydrogen sulfide, and carbon dioxide below allowable concentrations. These gases, at high enough levels, can be detrimental to animal and worker health and productivity. Below are guidelines for gases typically monitored in swine barns. It is important to note that readings should be taken at pig level to most accurately reflect what the pig is experiencing.

Ammonia – 10 ppm

Carbon dioxide – 3000 ppm

Hydrogen sulfide – 5 ppm

Pigs are very adaptive and as their environment changes, they acclimate by diverting energy away from growth to some other biological function. This makes identifying possible environmental stressors more difficult since the pig may seem to be eating and growing at a normal rate. However, careful evaluation of the pigs and their surrounding environment will help catch potential health and growth problems before they arise.

Environmental Impact on Growth FAQ

- **What type of disinfectants are most effective for swine barns?**
 - There is no single disinfectant that will work on every farm. It is important to select a disinfectant that has a label claim against the pathogen that you are trying to kill. Disinfectants are more effective on clean surfaces. It is important to use apply the disinfectant according to label directions. The contact time recommended on the label should elapse (usually 10 minutes). Dipping objects in disinfectant generally is not as effective as scrubbing or wiping an object with disinfectant. Commonly used disinfectants include a phenolic disinfectant, (One-stroke Environ); a quaternary ammonia compound (Roccal-D Plus); a chlorine compound, sodium hypochlorite (household bleach); an oxidizing agent, (Virkon S); and a quaternary ammonium/glutaraldehyde combination product (Synergize).
- **What can I do to help decrease the amount of dust present in my barns?**
 - The use fat or oils (1%) in swine diets can reduce the level of dust in the barns. Cleaning barns in between groups can also reduce dust accumulation. Many farms are using Electrostatic particle ionization units which work by emitting large numbers of negatively-charged ions into the air — some 10 million billion negative ions per second. These ions impart a negative charge to dust particles floating in the air, driving them to positively-charged barn surfaces, where they stick — just like metal filings adhere to a magnet. Dust may be collecting on the surface but it isn't free floating in the air affecting pigs' respiratory systems.
- **What type of resources are available for worker safety in swine barns**
 - The National Pork Board website has a number of resources on worker safety along with an “Employee Safety Toolkit.” All this information can be found on their website, www.pork.org under the Resources section.