

Cold Temperature Management for Pigs

Good husbandry and managing pig housing can reduce the impact of cold stress on swine herd performance.



Sow in Straw, Penn State Extension

As a pig producer, managing heat loss during winter months can be a struggle for the health of your pigs and your profits, particularly for pigs that are housed predominantly outside or in unheated shelters. Pigs that are struggling to stay warm commonly experience cold stress induced health problems, reduced growth rates, and poor reproductive performance.

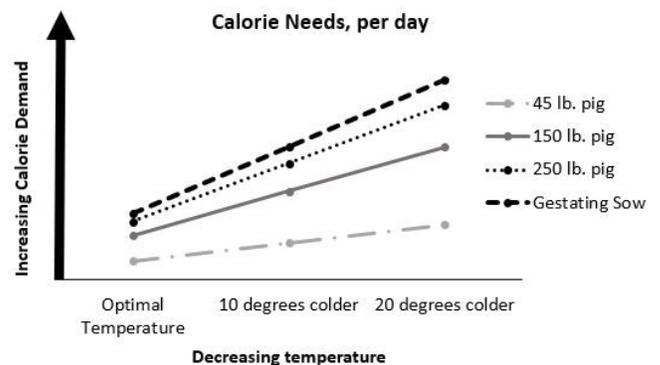
Historically, pig production was a **seasonal** venture, due to the high costs of keeping pigs warm. However, some producers may wish to **take advantage of the slow season at your local packer**, which means raising pigs to slaughter through the winter. Investing in proper housing can keep your pigs growing quickly and keep feed bills to a minimum. Producers choosing to raise swine over the winter may also be keeping a reproductive herd active. If you are breeding sows during the winter months, and housing them outdoors, investment in proper housing can improve the reproductive performance of your herd.

Cold Stress Index

Temperature stress is observed when pigs fall outside of their **thermal neutral zone**. This 'zone' is an environmental temperature range that allows the pig to prioritize feed nutrients for building meat or reproductive tissues, rather than struggling to maintain body temperature. For pigs, this thermal neutral zone is notably narrow. What does this mean? This means that pigs have a small range of temperatures that allow them to optimally prioritize nutrients for growth or reproduction; temperatures that fall outside of this range often results in some form of stress to the pig. **Pigs can experience heat stress** if housed persistently in temperatures above the thermal neutral zone. Similarly, pigs housed in temperatures that are persistently **below** the thermal neutral zone are at risk for experiencing cold stress. But what does stress, particularly cold stress, look like in a pig production setting? Predominantly, it means reduced feed efficiency, reduced or stunted growth rates, or weight loss.

Cold pigs are high maintenance, literally

Cold pigs, even mature pigs, **require more feed to maintain heat production and body condition**. Growing pigs living in cold conditions will have **poor feed conversion rates, increased feed intake**, and will likely **struggle to grow** without free access to good feed and housing keep warm. How much feed does it take to maintain body weight or growth in cold temperatures? Depending on the age and size of pig, and outside temperatures and weather conditions, you may need to increase the daily feed allowance by 3x or more.



Calories, energy to produce heat and stay alive, cannot realistically be met by simply increasing feed as the surrounding temperature decreases. Increasing energy density



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of the diet also has limitations on the impact it can have on pig growth in persistent cold. Why? Pigs are limited in their ability to eat massive amounts of calories in a given day. Essentially, when temperatures are too cold, and are **persistent** (lasting several days to weeks), pigs often find themselves in a **negative energy balance** that cannot be corrected with feed alone. This leads to slowed or stunted growth of young pigs, and weight loss in older pigs. Young pigs that grow slowly will continue to physiologically mature, but not maximize muscle growth before maturing to stages of fat deposition. In the most extreme cases, this can result in death. Cold stress creates a poor welfare situation for your pigs, as **cold stress** is an unnecessary burden, challenging their growth capacity, immune system, and even ability to live.

What does slow growth and increased feed mean? This means **more feed for less meat**; for your business, this means **greater input costs** (feed, housing) and **less return** (price per pig for meat yield).

In the North Eastern United States, cold spells are becoming more extreme. This impresses the importance of **appropriate housing for pigs during the winter**, as there is limited ability for a pig to meet its body heat needs through dietary means.

How cold is too cold?

For swine, tolerance of cold temperatures is dependent on numerous factors.

- Primarily, pigs should be offered **shelter from precipitation and dampness**. Water conducts heat. Humidity in the air will be drawn to your pigs and will pull heat from them. Regardless of flooring type or usage of bedding material, all efforts should be made to provide pigs with a **dry** bedding area.
- Provide wind breaks and **shelter from drafts**. When providing shelter, be sure that your wind breaks do not allow air to draft around the space at pig level.
- **Insulate** the pig area. This can take on a variety of forms, from bedding to insulated walls and ceilings. The idea is capture as much of the pigs' heat as possible, while still allowing air exchange. More information on winter swine housing can be found in the [Winter Housing for Swine Welfare](#) article found on Penn State Extension's website.
- Strive to keep ambient temperatures within the **thermoneutral (TN) zone** of the pig, **for age and body size**. The **thermoneutral zone** for most mammals varies with age and body weight. For suckling and young growing pigs, this is particularly important as they lack significant sources of **adipose (fat) at birth**, and do not develop these stores until maturity. This lack of fat prevents them from having any energy reserves to burn for maintaining body heat. Approximate thermoneutral zone temperatures are provided in the table below.

(Adapted from Effect of Environment on Nutrient Requirements of Domestic Animals).

Pre-wean (suckling pig)	85+
Wean pig, 15 lbs.	77-85
Nursery pig, 45 lbs.	70-75
Grower, 55 lbs.	68-75
Grower, 100 lbs.	60-65
Finishing, 200 lbs.	50-60
Gestating sow, 350 lbs.	60-65
Lactating sow, 350 lbs.	55-65

- Keep mature pigs in **good body condition score**. Maintaining a healthy adipose (fat) cover on mature pigs (~6 months or older) can act as both an insulator and an additional energy reserve for creating body heat. Routinely scoring the body condition of your pigs can help you make decisions on if they are getting enough to eat and how they are handling the winter temperatures. Pigs with poor body condition score will struggle more with cold temperatures than pigs of healthy body condition score. Find more instruction on how to body condition score by watching the [Principles of Body Condition Scoring in Swine](#) with Penn State Extension.

These tips on managing your pigs' environment can help you improve the winter conditions you're your pigs, meeting their needs and keeping your costs in check. As you prep your pigs for the winter cold, please reach out to Penn State Extension for more tips and information on addressing cold weather for your swine herd.

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Stage of pig growth	Temperature (F)
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