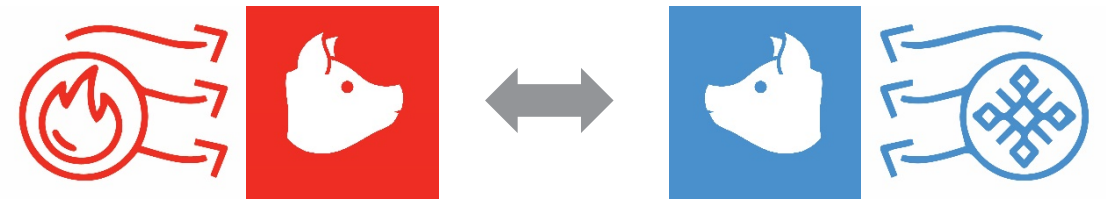
Getting it Right: Temperature and Ventilation

Balancing the relationship for maximum pig performance and profits



Maintaining optimal barn conditions is important for the well-being of the pigs and barn staff, as well as optimizing farm productivity.

While good ventilation improves humidity, dust and gas level conditions – promoting pig performance – **ventilation rates must be managed carefully to ensure proper barn temperature is maintained**. In the winter, the temperature of fresh wintry air intake must be balanced with proper heating management.

Through our own research and in collaboration with our customers, PIC experts have learned many lessons on how to best manage air exchange and temperature control year-round.

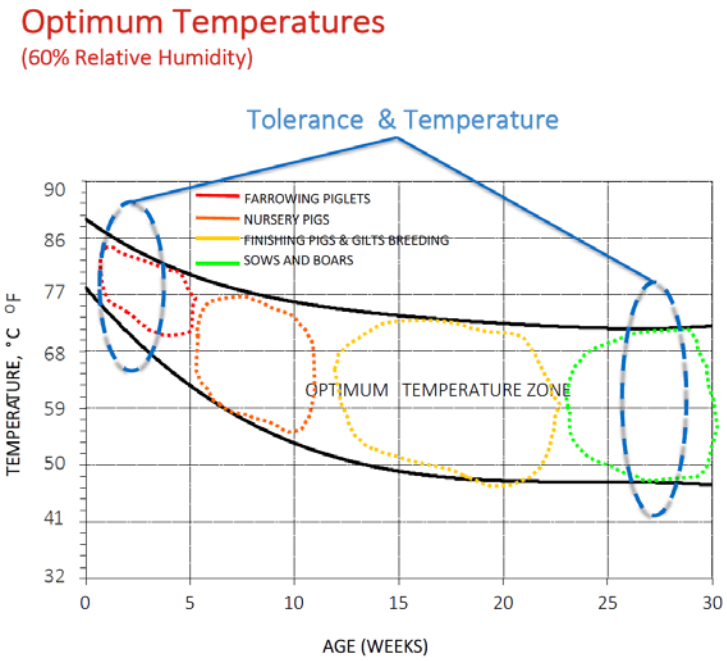
The most important point to share is this: **air exchange and temperature control should be managed separately.**

First, Let's Review Temperature and Ventilation Basics

Optimum Temperatures

Different types of pigs have different optimum temperatures. Obviously, newborn piglets have a higher **Desired Room Temperature (DRT)** than older pigs. Also, younger pigs are more susceptible to temperature variations than older pigs.

Remember – Over 75% of piglet deaths are impacted by chilling

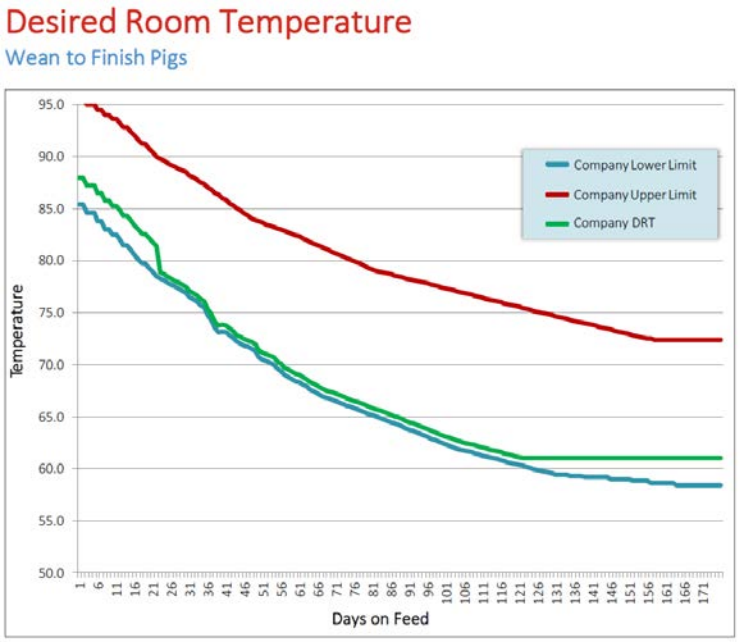


Desired Room Temperature (DRT)

When developing a temperature curve, **Desired Room Temperature (DRT, or goal temperature of the barn)** should be the focus, and the "set point" should simply be where the controller should be set to achieve that DRT.

It's important to remember that no matter the time of the year, as wean-to-finish pigs grow and get larger, DRT is reduced from over 85°F to below 60°F (specific DRT numbers will depend on pig weight, health status, barn design as well as the use of a "comfort zone", please refer to *Appendix A in our Wean-to-Finish Manual*.

If barn temperatures are too low, pigs must expend energy to keep themselves warm instead of converting feed into lean muscle accretion. If barn temperatures are too high, pigs must expend energy into keeping their body temperature at acceptable levels, which can also result in reduced performance.



Comfort Zones

On the other hand, an optimum barn temperature will result in minimum required heat generation and maximum growth rate and feed conversion. For young pigs, comfort zones are an effective way to keep pigs warm and keep ventilation rates where they need to be to maintain proper air exchange and humidity levels. Comfort zones are also important for special pens and where barn heating systems are inefficient, or the cost of heating is otherwise high.

When using brooders and/or mats, comfort zones should be at 95°F directly beneath the brooder for 14-to-21 days upon placement, dependent on pig size and health. Remember, pigs require 0.4 ft^2 of mat space to maximize pig comfort and eliminate drafting from below the slats or plastic flooring. See Pig Improver (Early Pig Care in Detail) on how to properly use comfort zones.

Minimum Ventilation

Good ventilation management in the winter months means maintaining a minimum ventilation rate while optimizing air flow to reduce energy losses.

Minimum Ventilation

Days on Feed	Weight	Winter CFM
1	12 lbs (5.4 kg)	2.0
8	15 lbs (6.8 kg)	2.0
15	19 lbs (8.6 kg)	2.0
22	24 lbs (10.9 kg)	2.0
29	31 lbs (14.1 kg)	2.2
36	41 lbs (18.6 kg)	2.6
43	51 lbs (23.1 kg)	2.9
50	62 lbs (28.1 kg)	3.3
57	73 lbs (33.1 kg)	3.9
64	86 lbs (39.0 kg)	4.5
71	100 lbs (45.4 kg)	5.1
78	113 lbs (51.3 kg)	5.4
85	127 lbs (57.6 kg)	5.9
92	142 lbs (64.4 kg)	6.6
99	156 lbs (70.8 kg)	7.1
106	171 lbs (77.6 kg)	7.8
113	186 lbs (84.4 kg)	8.5
120	200 lbs (90.7 kg)	9.2
127	215 lbs (97.5 kg)	9.9
134	230 lbs (104.3 kg)	10.6
141	243 lbs (110.2 kg)	11.2
148	258 lbs (117 kg)	11.9
155	272 lbs (123.4 kg)	12.6
162	284 lbs (128.8 kg)	13.3
169	297 lbs (134.7 kg)	13.9
176	310 lbs (140.6 kg)	14.6

During summer months or during later stages of the ventilation system, **our goals change from properly ventilating the barn to achieving proper air exchange and gas levels. Without burning excessive fuel, this is achieved by reducing the temperature in the barn to stay within the thermoneutral zone of the pig**.

When barn temperature falls below a given set point, the ventilation system should be operating at the minimum setting - this is called minimum ventilation (expressed as CFM/pig or CFM/lb., which is the minimum ventilation rate to remove the humidity and gases produced for the pigs). Likewise, when barn temperatures are above a given set point, the ventilation system should enter higher stages, allowing for more rapid air exchange rates as the goals begin to change.

Pig Improver

Good ventilation management during in the summer months means having the capabilities to maintain a DRT within the pigs thermoneutral zone to drive productivity. This could mean different things across the globe, but some general targets are:

- A bandwidth of 1.0 – 1.5°F between stages
- A maximum air exchange rate of 40-50 CFM/pig at the end of nursery (60 lbs.)
- Tunnel airspeed measured throughout the barn at 300 – 400 FPM (windspeed)
- Cool cell capacity to achieve 300 – 400 FPM through the pad for maximum efficiency
- Drip/sprinkler system to penetrate the hair of the pig and enough time to allow for complete evaporation of the water on the pig's skin (100+ lbs.)

By following these best practices, pig productivity and comfort can be properly maintained throughout the year. Striking a balance between ventilation and temperature, will provide the best possible way to optimize barn conditions to help your farm reach its full potential.

For more guidance on proper ventilation management, reach out to your PIC Account Manager.

Our future – and yours – has never looked so bright, as PIC continues to deliver on our promise to Never Stop Improving.