

Swine Industry: Summer Heat

When you read this article in March, your thoughts will just be turning towards spring weather and warmer and sunny days to come. That means summer heat won't be too far behind. In the swine industry, summer heat means a decline in feed intake and lighter slaughter weights as a result.

While producers are aware of the need to assist pigs with summer heat relief, many still have the false impression that because pigs today are leaner (less fat) than the pigs their parents raised they don't have as much need for summer cooling relief. In fact, just the opposite is true.

Today's rapidly growing pigs and highly productive lactating sows generate more heat per unit of bodyweight than pigs of 10 and 20 years ago. The deposition of muscle and the production of milk are the major source of heat by pigs. Today's pigs deposit muscle at a faster rate (higher rates of lean gain) than pigs in previous generations which results in pigs being more sensitive to summer heat. Data in the scientific literature suggests that heat output (Btu/hr./lb. of bodyweight) has increased 10-15% every 10 years since at least the mid-1980s in growing pigs.

How much heat are we talking about? In thermal neutral conditions such as a finishing barn in winter with a room temperature of 65F, a 280 lb. market pig will generate approximately 1200 Btu/hr. of total heat. Of this heat, approximately 800 Btu/hr. will be sensible heat (think air temperature) and 400 Btu/hr. will be latent heat (think moisture in the air from respiration, urine drying, etc.). In summer with temperatures of 85F, total heat production declines to approximately 1000-1100 Btu/hr. with 5-600 Btu/hr. of this as sensible heat and the remainder as latent heat.

The conversion of sensible heat to latent heat is a very effective cooling mechanism. For every pound of water evaporated from the skin surface, it takes 1044Btu of sensible heat. Thus, wetting pigs in summer heat is a very effective cooling method.

Contrast this evaporation heat loss versus a pig trying to lose heat in an 85-90F air temperature when its skin temperature is approximately 95F. There is only 10F of air temperature difference which makes heat loss (transfer) very slow since the temperature gradient is so small.

Heat loss occurs during the drying period of the wet and dry cycling of the misting or wetting system in barns. During the wetting period the pigs blood vessels actually vaso-constrict in response to water hitting the skin meaning little heat transfer can occur.



The recommendation for effective summer cooling for market weight pigs is that you have the system set to thoroughly wet the skin of the pigs (not mist the air above the pigs) and then let the wet pigs dry for 15-20 minutes before re-wetting. Generally the plumbing for the cooling lines should be sized and installed that the wetting period (ON time) is no more than 2 minutes to avoid adding too much water to manure storage devices such as pits from run-off on the first pens of pigs that get wet. In hotter weather shorten the interval between wetting episodes. Do not increase the ON time for the wetting cycle – it takes the same length of time to wet pigs in hot weather as in warm weather. Begin the wet/dry cycle at 80F for pigs weighing 150 lb. or greater.

About the Author - Dr. Mike Brumm



After a successful career as professor of animal science and extension swine specialist at the University of Nebraska, Dr. Mike Brumm incorporated Brumm Swine Consultancy in the summer of 2006. As an industry consultant, Dr. Brumm spent 50% of his time through 2015 as science director for 4 2400-hd wean-finish research barns. He now spends his time in partial retirement in client production facilities, investigating ventilation and housing issues. He remains a frequent presenter at producer conferences on issues dealing with housing and management, with a special emphasis on feeders, drinkers, ventilation systems and ventilation system controllers. In addition, he is a frequent contributor to industry publications and blogs weekly at www.MnPork.com.

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