

Season 3, Episode 9: Research on Heat Stress

Dr. Josh Selsby, Iowa State University, and Dr. Kara Stewart, Purdue University, discuss heat stress and its impact on the boar.



Economics

Heat stress is a costly issue for the swine industry, not only in the United States but throughout the world. Estimated economic losses, due to heat stress, are upwards of 900 million dollars per year in the United States. This negative economic impact is split between the grow finish stage of production and the breeding herd.

Definition

During a heat stress event, animals will modify their behavior in order to cope with the stressor. For example, panting or laying down to conserve energy. When modified behaviors do not mitigate the heat stress the animal diverts blood flow to outer extremities of the body. This reallocation of blood flow leads to oxygen depletion in the gut and central organ systems, resulting in breakdown of enterocytes. Ultimately, reduced feed intake and negative impacts on reproduction occur.

Research

Dr. Josh Selsby is part of a National Institute of Food and Agriculture (NIFA) grant evaluating the biological and applied impacts of heat stress on swine. The first portion of the grant is conducting research to assess the implications of heat stress on barrows and gilts. Evaluations on muscle and endocrine parameters by sex were studied and used to understand changes at the production level. The second portion of the grant is an extension piece to share outcomes of this work with the public and producers.

The boar

Several studies have been conducted to evaluate heat stress on boars. It takes about two weeks for heat stress to impact sperm. First motility is reduced, and then morphological changes occur. Trashed ejaculates can reach as high as 20% during summer months, compared to 3% during cooler periods. Boar studs should continue to evaluate semen records and look ahead in order to plan for reduction in semen quality due to heat stress.

Management

Fortunately, there are several management strategies that can help reduce heat stress. Increasing air flow and installing misters can keep barns and animals cooler. Feed additives such as betaine and phytase super dosing could have some beneficial impacts. Cooling pads have been used for sows during lactation and similar benefits of this equipment apply to boars. Newer construction boar stud buildings now have air conditioning as well. Technology, such as electronic feeding systems and cameras, can provide early indicators of which animals are stressed or susceptible. Heat stress is an ongoing issue for the swine industry and proper management can help mitigate this challenge.

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