

PATHKINEX UPDATE



Heat Stress Significantly Impacts Performance of Livestock and Poultry. Does It Also Increase Pathogen Load?

Heat stress has a measurable, detrimental impact on productivity and animal welfare across all sectors of the livestock and poultry industries. Estimates of

annual losses due to heat stress in the US alone range from nearly US\$1 billion for swine to US\$1.5 billion for dairy, and between US\$128 million and US\$165 million for poultry¹²³. With the rise of global temperatures and increased frequency of drought events, the costs of heat stress on livestock and poultry are expected to increase in coming years.

Sows in particular experience significant impacts of heat stress throughout their lifespan. During breeding, heat stress lowers fertility. Once pregnant, sows that experience heat stress can predispose their offspring to diminished performance, inefficient feed use, poorer growth rates, and altered innate immune function. Also, when lactating during heat stress, sows have reduced feed intakes and depressed milk production, which in turn reduces piglet body weights.



Heat Stress Effects on the Gastrointestinal Microbiota

United Animal Health's multi-year PathKinex surveillance has demonstrated increased quantities of several toxin genes associated with multiple pathogens in both swine and dairy animals during warm spring and summer months. These trends underscore the growing need for tools to manage seasonal challenges.

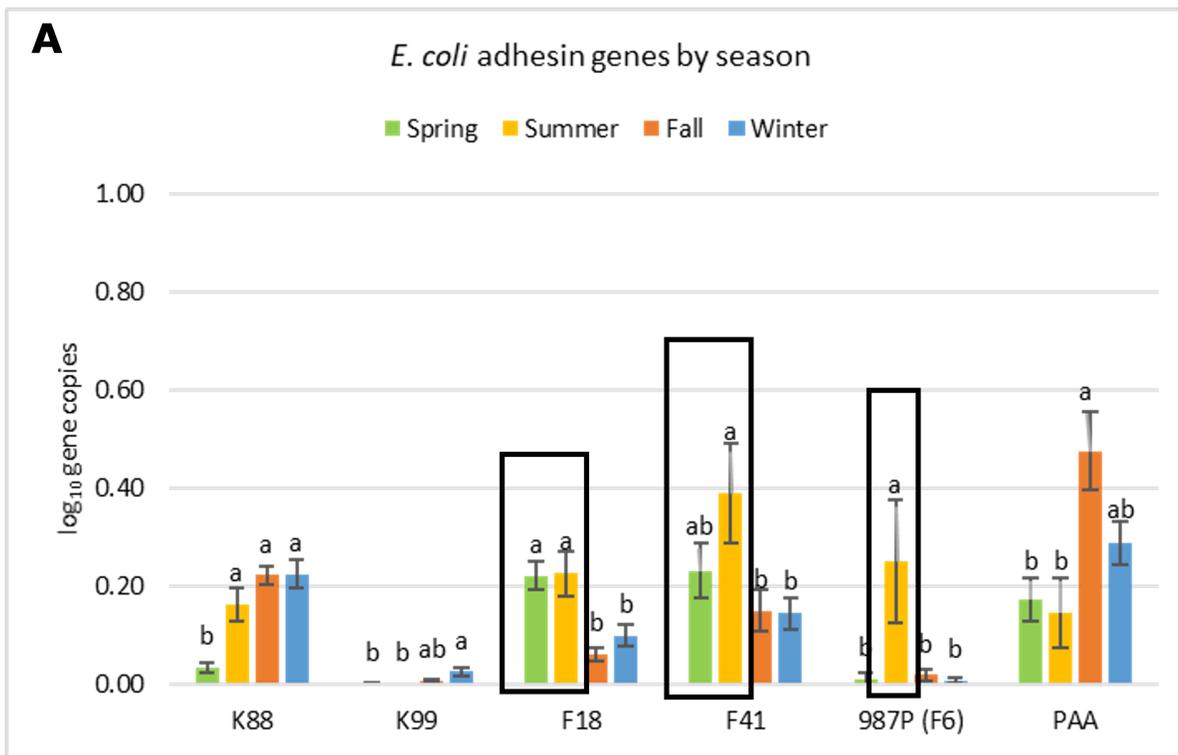
During the warmer months, heat and humidity promote the survival of opportunistic bacteria found in or on manure, pens, drinking water, and barn surfaces, leading to a higher risk of exposure.

With this increased microbial exposure and simultaneous immune suppression, heat-stressed animals are vulnerable to opportunistic pathogens acting in the gastrointestinal tract, creating health and performance disruptions.

It is known that multiple opportunistic pathogens such as *E. coli*, *Salmonella*, and *Clostridium* can colonize the dysbiotic gut during heat stress.

Our Pathkinex surveillance data shows increases in quantities of virulence genes in both swine and dairy (Figure 1), indicating that heat stress-associated pathogen elevation may be a broadly observed phenomenon.

Swine PathKinex Analysis



Dairy PathKinex Analysis

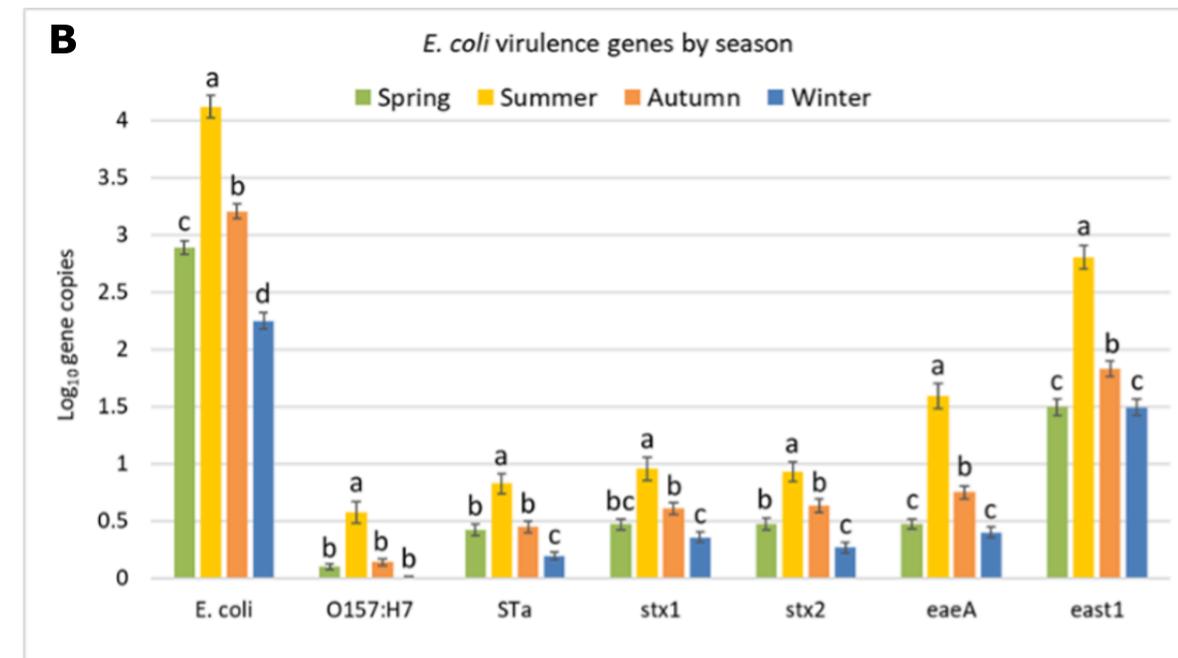


Figure 1. PathKinex examples demonstrating the impact of seasonality on *E. coli* virulence genes in (A) sows (n=1183) and in (B) dairy cows (n=1313). Microbial

pathogen gene quantities were compared in spring (March-May), summer (June-August), autumn (September-November), and winter (December-February). Means that do not share a letter are significantly different $P < 0.05$.



How Can a DFM Help with Heat Stress?

A strategy that uses performance-focused direct-fed microbials like **Visano[®] Sow** for swine or **Novela[®]** for poultry may help beat the heat by keeping intakes up and reducing losses due to suboptimal feed conversion, while **ProVent[®] ECL** for swine, **Novela[®] ECL** for poultry or **Strateris[®] ECL** for dairy have demonstrated antimicrobial activity against a wide range of enteric pathogens and may be an effective tools in preventing gut disruption during seasonal challenges. Use of DFMs as part of a proactive approach to seasonal challenges can help you beat the heat and maintain high performance and health across your flow, herd or flock!



Maintain Feed Intakes and Wean Weights in Warm Weather Months by Implementing Visano[®] Sow

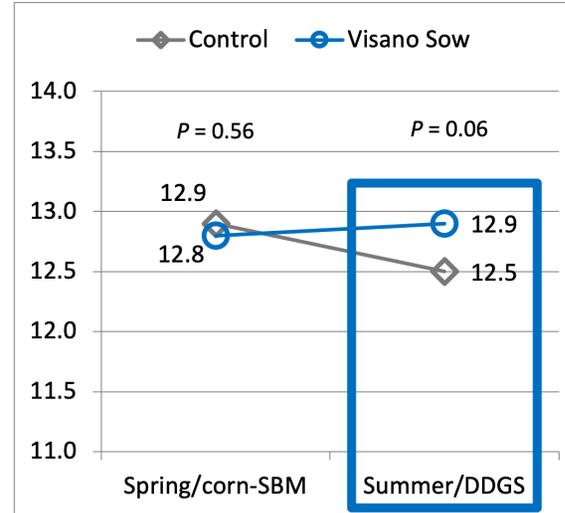
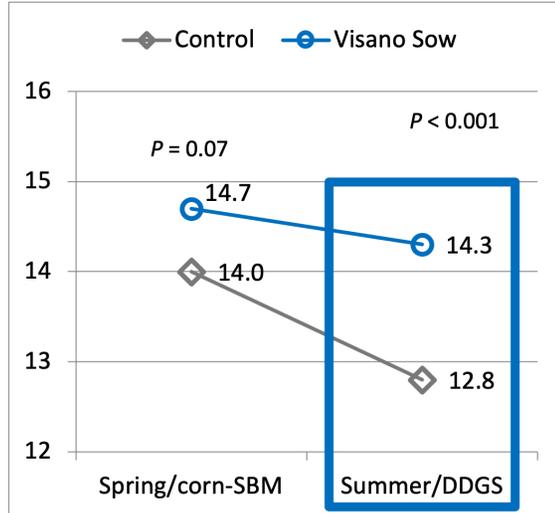
Using swine as an example, the effect of heat stress on lactation feed intake and progeny wean weights were demonstrated for sows fed diets with or without Visano[®] Sow at 1 lb/ton during spring or summer months. In the spring, 63 sows per treatment were fed a corn-SBM diet, while in the summer, 60-62 sows per treatment were fed a DDGS-containing diet.

The results showed that implementing Visano[®] Sow helped maintain sow feed intakes in the summer when heat stress could cause lower intakes.

Additionally, wean weights were 0.4lbs. greater in progeny from sows fed Visano[®] Sow during the summer months.

Seasonality effect on ADFI lactation (lbs.)

Seasonality effect on wean weights (lbs.)



Consider reviewing additional materials on this topic!

CLICK HERE FOR ADDITIONAL RESOURCES

Are you seeing the same trends in the field? Share your DFM heat stress stories with us! Or is there a topic you'd like to learn more about in a future newsletter? We enjoy hearing from you! We welcome your questions, comments and suggestions on PathKinex updates. Please contact us at AnimalAg@mdgbio.com

References

1. Pollmann DS. Seasonal effects on sow herds: industry experience and management strategies. In *Midwest American Society of Animal Science conference proceedings*. 2010, Des Moines, IA.
2. Key N. and Sneeringer S. Potential effects of climate change on the productivity of U.S. dairies. *Am. J. Agric. Econ.* 2014; 96: 1136-1156
3. St-Pierre, N.R.; Cobanov, B.; Schnitkey, G. Economic Losses from Heat Stress by US Livestock Industries. *J. Dairy Sci.* 2003, 86, E52-E77.



[Click Here to Unsubscribe](#)