IMPACT of Stafac® (Virginiamycin) on performance of heat-stressed finishing pigs

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Introduction and Objective

Researchers and producers have noted that high-lean growth pigs are more susceptible to heat stress. Total heat production (THP) in finishing swine was found to be 26% higher in thermal neutral conditions than the current standards.[1] THP in early weaned pigs was reported as 33% higher than the 1999 ASAE standards.[2] Heat production increases linearly with percent muscle.[3] The added heat production generated by the metabolism rate of high-lean genetics makes it more difficult for these pigs to maintain homeothermy in warm or hot environments. Threshold temperatures were calculated to be approximately 7.2° F lower for high-lean genetics than moderate-growth genetics.[4] Poultry producers find the benefits of adding virginiamycin (Stafac®) to poultry diets is greater in heat-stress conditions than in controlled conditions. Researchers found caloric efficiency improved in birds fed Stafac suggesting that less energy is wasted on heat production.[5] Stafac likely controls the massive proliferation of gram positive gut microbes found to reduce performance in birds exposed to heat stress. A study with swine was conducted in the Brody Climatology Chambers at the University of Missouri to measure the impact of Stafac 10 g/ton on performance in pigs subjected to heat stress.

Material and Methods

Seventy-two finishing pigs (TR-4 × C22) weighing approximately 200 lb. were randomly assigned to treatment and environmental groups in a 2 × 2 factorial design. Six replicate pens of pigs (3 pigs/pen) were fed diets containing Stafac 10 g/ton or no Stafac and exposed to thermal neutral (TN) or cyclic heat stress (HS) conditions in environmental chambers. Experimental diets were fed for 14 days prior to and 28 days during placement in the environmental chambers. The TN chamber temperature remained at 73.4° F for the 28-day study duration. Temperatures in the HS chamber cycled between 98.6° F (11am to 7pm) and 80.6° F to mimic fluctuations found between daytime and nighttime temperatures. Body weights and feed intakes were measured at study initiation (day 0) and study termination (day 28). Data were analyzed using GLM procedures of SAS evaluating the main effects of environment and treatment and any interactions between the two for time period days 0 to 28.

Results and Discussion

The HS environment had a significant effect (P<.05) on feed intake, weight gain, and feed conversion. All three were negatively impacted by heat stress (Table 1). Stafac improved (P<.09) ADG in both the TN and HS environments (2.67 vs. 2.51 and 1.76 vs. 1.57 respectively). Stafac did not impact feed intake in either environment. As a result, there was a significant improvement (P<.05) in F/G for Stafac fed pigs in both the TN and the HS environments (2.89 vs. 3.03 and 3.28 vs. 3.66 respectively). These data indicate that Stafac 10 g/ton can help maintain growth performance in heat stressed finishing pigs. This benefit most likely results from the antimicrobial activity of virginiamycin positively impacting the GI microflora and reducing heat increment in pigs, especially during periods of heat stress.

Table 1. Impact of Stafac 10 g/ton on heat-stressed barrows

Environment	Thermal Neutral (73.4 °F)		Hot (80.6-98.6 °F)		P values			
Trt	CTL	VM	CTL	VM	T°	Trt	T° X Trt	SE
BWd0 (lbs)	200.8	199.4	202.1	200.4	.72	.61	.97	3.02
BWd28 (lbs)	271.1	274.1	246.1	249.6	.01	.47	.96	4.35
ADG (lbs)	2.51	2.67	1.57	1.76	.01	.09	.90	.09
ADFI (lbs)	7.57	7.71	5.70	5.71	.01	.70	.72	.19
F:G	3.03	2.89	3.66	3.28	.01	.03	.26	.10

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