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DETERMINATION OF THE ENERGY VALUE OF STAFAC® (VIRGINIAMYCIN) IN FINISHING PIG DIETS

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Introduction and Objective

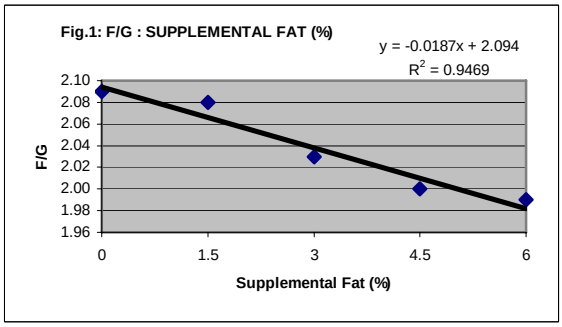
Research investigating effects of virginiamycin in poultry diets has shown improvements in phosphorous and energy utilization and sparing of protein and amino acids.[1,2,3,4] Similar research with swine also demonstrated improved phosphorus digestibility and greater availability of energy and amino acids when virginiamycin was added to the diet.[5,6] In vitro research measuring energy utilization in continuous culture of swine ileal contents found virginiamycin spared 44.24 kcal of net energy (NE) per pound of dry matter consumed.[7] To validate the energy value for Stafac® in swine, we evaluated the energy response curve of pigs fed different levels of supplemental fat as choice white grease and used this energy response curve to predict the energy value of Stafac®.

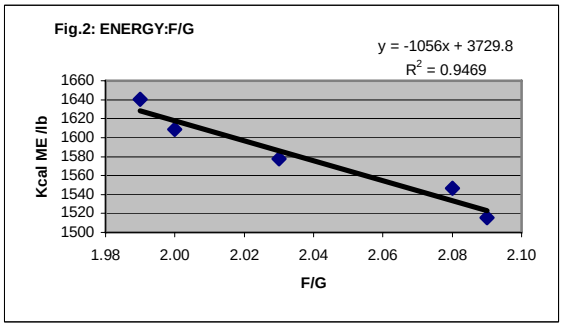
Materials and Methods

At approximately 65 lb. BW, 1,764 barrows and gilts (TR-4 × C22) were blocked by weight and sex then assigned to one of six dietary treatments with 14 replicate pens/treatment (84 pens total). Corn-soybean meal diets were supplemented with five different fat levels (0.0, 1.5, 3.0, 4.5, and 6.0%) as choice white grease with no Stafac®. The sixth treatment diet contained 1.5% supplemental fat with 10 grams/ton Stafac®. Soybean meal amount was held constant across diets and dietary lysine was increased using L-lysine HCl. Experimental diets were fed for 21 days. Body weights and feed intakes were measured at trial initiation (d0) and trial termination (d21). Data were analyzed using GLM procedures of SAS in a randomized complete block design. The statistical model included effects of replicate, and treatment. Polynomial coefficients were used to determine linearity and nonlinearity of appropriate treatment means.

Results and Discussion

Animal health and feed intake was good. There was a strong linear relationship (R^2 = 0.9469) between increasing fat levels and feed conversion (F/G) (Fig. 1). F/G ratios improved 10 points when fat was added at 6.0% of diet compared to no added fat (1.99 vs. 2.09). Stafac® added to the diet containing 1.5% fat improved F/G when compared to the 1.5% fat diet containing no Stafac® (2.05 vs. 2.08). Fitting the F/G of the Stafac® medicated pigs onto the energy response curve results in a calculated energy value of 18.5 kcal ME/lb. for Stafac® (Fig.2).





This sparing effect in live production supports earlier in vitro research demonstrating the energy sparing action of Stafac® on the digestive process in pigs.[7] Likely modes of action for this effect are (a) the potent antimicrobial activity of virginiamycin against gram-positive bacteria protects carbohydrates in the diet from breakdown and utilization by these bacteria in the foregut of the pig; and (b) Stafac® slows the rate of feed passage through the pig's digestive tract.[8] Depending on prices of energy sources, sparing 18.5 kcal of ME can save $1 – $3 per ton in formulation costs when Stafac® 10 g/ton is added to grow-finish diets to enhance rate and efficiency of growth in swine.

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