

**PSV-21 effects of soybean meal and net energy level on nursery pig performance.** Brittany Carrender<sup>1</sup>, Hayden E. Williams<sup>2</sup>, Joel M. DeRouchey<sup>2</sup>, Mike D. Tokach<sup>2</sup>, Steve S. Dritz<sup>2</sup>, Cassandra K. Jones<sup>2</sup>, Robert D. Goodband<sup>2</sup>, Kyle F. Coble<sup>1</sup>, Amanda J. Gerhart<sup>1</sup>, <sup>1</sup>JBS Live Pork, <sup>2</sup>Kansas State University

Nursery pigs (n = 3,796; 17.6 kg BW) were used in a 22-d study evaluating the effects of increasing soybean meal on nursery pig performance. At 8 weeks of age, pens were allotted to treatment based on location in a randomized complete block design with 39 to 40 pigs per pen. Ten pens were placed on the positive control treatment and 12 pens placed on all other treatments. Experimental diets were fed in one phase (d 0 to 22) in meal form. Treatments included a positive control diet with 40% soybean meal and 1.8% choice white grease. Six diets were formulated with increasing soybean meal (17.5 to 40%) without added fat. Pigs were weighed on d 0, 13, and 22 to determine ADG, ADFI, G:F and NE efficiency. Growth data were analyzed as a randomized complete block design with pen as the experimental unit. Growth data were evaluated using linear and quadratic effects of soybean meal level and a pairwise comparison of the 40% soybean meal treatments with and without added fat. An outbreak of *E. coli*-associated disease was noted in the first 2 weeks of the experiment. Overall, increasing soybean meal tended to decrease (linear;  $P = 0.070$ ) ADG, decreased (linear;  $P = 0.0001$ ) ADFI, improved (linear;  $P = 0.0001$ ) G:F and caloric efficiency, and reduced (linear;  $P = 0.050$ ) removal rate (Table 1). Pigs fed the positive control had decreased ( $P = 0.019$ ) ADFI and improved ( $P = 0.001$ ) G:F compared to pigs fed the 40% soybean meal diet without added fat. These results suggest the net energy value for soybean meal was underestimated in diet formulation. Increasing soybean meal level in the diet reduced removal rate, suggesting soybean meal may provide added health benefits beside amino acids and energy.

Table 1. Effects of soybean meal and net energy level on nursery pig performance

Item <sup>1</sup>	Diet SBM level, %:	17.5	22	26.5	31	35.5	40	40 <sup>3</sup>	SEM
	Diet NE, kcal/kg <sup>2</sup> :	2456	2434	2412	2388	2366	2344	2425	
d 0 to 22									
ADG, g <sup>4</sup>		820	825	818	809	812	809	811	7.8
ADFI, g <sup>5,6</sup>		1,500	1,509	1,473	1,424	1,415	1,401	1,338	19.3
G:F <sup>5,6</sup>		0.547	0.548	0.556	0.568	0.574	0.578	0.607	0.5947
NE efficiency, kcal/kg gain <sup>5,7,8</sup>		4,492	4,450	4,342	4,203	4,126	4,055	4,000	47.2
Removals, % <sup>3</sup>		0.58	0.89	0.71	0.43	0.14	0.14	0.58	0.447

<sup>1</sup>ADG = average daily gain, ADFI = average daily feed intake, and G:F = feed efficiency.

<sup>2</sup>Ingredient energy values based on NRC (2012) estimates.

<sup>3</sup>Diet containing 1.8% added fat.

<sup>4</sup>Level main effect (linear;  $P = 0.07$ ).

<sup>5</sup>Level main effect (linear;  $P < 0.05$ ).

<sup>6</sup>Pairwise comparison of diets containing 40% added SBM ( $P < 0.05$ ).

<sup>7</sup>Caloric efficiency = Kcal of NE per kg of gain ((ADFI × NE/kg)/ADG).

<sup>8</sup>Caloric efficiency based on NRC (2012) NE estimates for ingredients.

**Key words:** net energy, nursery, performance

**PSV-24 Effects of non-animal protein in nursery diets on wean to finish pig performance and carcass characteristics.** Q. Huang, D Pangen, Hayford Manu, L. Hanson, S. K. Baidoo, *University of Minnesota*

The aim of this study was to investigate the effects of a non-animal protein source in nursery diets on performance and carcass characteristics of wean to finish pigs. A total of 432 piglets with initial BW  $6.31 \pm 0.13$  kg were blocked by BW and randomly assigned to 1 of 6 treatments. Treatments included PC1AP1: animal protein, nursery nutrient specifications without additives; PC2AP2: animal protein, grower nutrient specification without additives; NC1NP1: Non-animal protein, nursery specification without additives; NC2NP2: Non-animal protein, grower specification without additives; NC1 NP1 + FA (Feed Additives): NC1 NP1 with additives; NC2 NP2 + FA: NC2 NP2 with additives. Feed Additives [Enzymes (Xylanase,  $\beta$ -Glucanase, Invertase used), Oregano Essential Oil] were used in Treatments NP1 +FA and NP2 +FA. A linear model was used via the GLM procedure of SAS 9.4, with treatment as fixed effect and block as random effect. Pigs fed on the non-animal protein source and supplemented with feed additives had similar ADF, ADG, and G:F at finishing compared with treatment group on animal protein source ( $P > 0.05$ ). No treatment differences ( $P > 0.05$ ) for digesta, liver and serum based on a principal component AA analysis. ( $P > 0.05$ )[H2] No positive carry-over effects ( $P > 0.05$ ) were found for performance except that pigs fed on the animal protein source had greater hot carcass weight ( $P < 0.05$ ) than the non-animal protein group. In conclusion, wean pigs fed either animal or non-animal protein source at nursery had similar performance at finishing stage and similar carcass characteristics even though pigs on animal protein source had greater hot carcass weight relative to those on plant protein. [H1] Define FA [H2] Do not mention digesta, liver, or serum. Rather state the variables you analyzed in those samples.

**Key words:** pigs, non-protein source; performance, carcass characteristics