(PSIV-18) Standardized Ileal Digestible Amino Acids and Digestible Energy Contents in Two Modified Soy Protein Concentrates and Soybean Meal Fed to Growing Pigs. Lee-Anne Huber[1], Cuilan Zhu[1], Lauren Hansen[1], Cierra Kozole[1], Cristhiam Jhoseph Munoz Alfonso[1], Jessica Mark[1], Reza Akbari Moghaddam Kakhki[1], Youngji Rho[1], Elijah Kiarie[1], [1]*University of Guelph*

Abstract: Six ileal-cannulated barrows (28.0±1.3 kg initial BW) were used in an incomplete Latin square design over four periods (n=7 or 6) to determine standardized ileal digestible (SID) AA and digestible energy of two modified soy protein concentrates [MSPC1 and MSPC2] and soybean meal (SBM). Pigs were fed one of three cornstarch-based diets with either MSPC1 or MSPC2 or SBM as the sole source of AA at a rate of 2.8 × estimated maintenance energy requirement. In each period, pigs were adapted to diets for 7 days followed by 2 days of fecal collection and subsequently, 2 days of continuous ileal digesta collection for 8 hours. The SID of AA were calculated using basal endogenous losses from a previous study for pigs fed a nitrogen-free diet. The digestible energy of the ingredients was calculated according to the difference method using the nitrogen-free diet that contained the same cornstarch:sucrose:oil ratio as the three test diets. The SID of crude protein was greater for MSPC1 (96.9%) than for SBM (91.3%; P < 0.05), while an intermediate value was observed for MSPC2 (94.3±1.2%). The SID of Ile, Leu, Lys (93.9%), Phe, and Val were not different between MSPC1 and MSPC2 but greater than for SBM (SID Lys: 84.5±1.7%; P < 0.05). The SID of His, Met, and Thr were greater for MSPC1 than MSPC2 and SBM (P < 0.05), which were not different. The SID of Arg was greater for MSPC1 than MSPC2 and SBM (P < 0.05), and greater for MSPC2 than SBM (P < 0.05). The digestible energy was greater for MSPC1 (4,677 kcal/kg) than MSPC2 and SBM (3,896±239 kcal/kg; P < 0.05), which were not different. Therefore, the MSPC1 was a better source of SID AA and digestible energy than either MSPC2 or SBM and could be used as a high-quality protein ingredient in swine rations.

Keywords: modified soy protein concentrates, pig, standardized ileal digestible amino acids

PSIV-20 The Effect of Live Yeast and Yeast Extracts Included in Lactation and Nursery Diets on Nursery Pig Fecal Antimicrobial Resistance. Jenna A. Chance[1], Joel M. DeRouchey[2], Raghavendra G. Amachawadi[2], Victor Ishengoma[2], Tiruvoor Nagaraja[2], Robert D. Goodband[2], Jason C. Woodworth[2], Mike D. Tokach[2], Qing Kang[2], Joseph Loughmiller[3], Brian Hotze[3], Jordan T. Gebhardt[2], [1]*Elanco Animal Health,* [2]*Kansas State University,* [3]*Phileo by Lesaffre*

Abstract: A 45-d study used 340 weaned pigs (Line 241×600, DNA) to evaluate yeast additives in sow diets and yeast-based pre- and probiotics (Phileo by Lesaffre, Milwaukee, WI) in nursery diets on antimicrobial resistance (AMR) of fecal *Escherichia coli*. At weaning, pigs were penned based on sow diet and randomly assigned to 2 treatments with 5 pigs/pen and 17 pens/treatment. Treatments were a 2×2 factorial of sow treatment (control vs. yeast-based pre- and probiotic diet; 0.10% ActiSaf Sc47HR+ and 0.025% SafMannan) and nursery treatment (control vs. yeast-based pre- and probiotic diet; 0.10% ActiSaf Sc47HR+, 0.05% SafMannan, and 0.05% NucleoSaf from d 0-7, then levels reduced 50% from d 7-24). A common diet was fed from d 24-45. Microbroth dilutions were used to determine minimum inhibitory concentrations (MIC) of *E. coli* isolates to 14 antimicrobials. A 3-way interaction of sow treatment×nursery treatment×sampling day was observed ($P < 0.05$) for ciprofloxacin, gentamicin, sulfisoxazole, and trimethoprim/sulfamethoxazole (Table 1). For ciprofloxacin, MIC was reduced ($P = 0.044$) on d 45 for the yeast-fed sow, yeast-fed nursery group *compared with* pigs from the yeast-fed sow, control-fed nursery group. The MIC values for the yeast-fed sow, yeast-fed nursery treatment were greater ($P = 0.021$) for gentamicin on d 5 but less ($P = 0.018$) than on d 24 compared with the yeast-fed sow, control-fed nursery treatment. On d 45, progeny of the control sows fed yeast in the nursery had less ($P = 0.005$) MIC to sulfisoxazole than control-fed sow, control-fed nursery treatment. Fecal *E. coli* had decreased ($P = 0.004$) MIC on d 5 to trimethoprim/sulfamethoxazole from the control-fed sow, yeast-fed nursery treatment compared with the control-fed sow, control-fed nursery treatment. All fecal *E. coli* isolates were susceptible to all antimicrobials except tetracycline on d 5. In conclusion, feeding sows live yeast and yeast extracts impacted fecal *E. coli* AMR in their progeny and this impact depends on nursery diet and post-weaning sampling day.

Table 1. Interactive effects of yeast-fed sows and yeast-fed nursery pigs over time on minimum inhibitory concentrations of antimicrobials for nursery pig fecal *Escherichia coli*[1]

	Sow treatment/Nursery treatment			
	Control		Yeast	
Item	Control	Yeast	Control	Yeast
Ciprofloxacin				
d 5	0.020 ± 0.0043	0.015 ± 0.0032	0.018 ± 0.0040	0.033 ± 0.0071
d 24	0.015 ± 0.0032	0.017 ± 0.0037	0.029 ± 0.0062	0.017 ± 0.0037
d 45	0.018 ± 0.0038	0.025 ± 0.0053	0.028 ± 0.0060	0.015 ± 0.0032
Gentamicin				
d 5	0.96 ± 0.210	0.89 ± 0.194	0.96 ± 0.210	2.00 ± 0.437
d 24	0.48 ± 0.086	0.48 ± 0.086	0.72 ± 0.129	0.39 ± 0.070
d 45	0.72 ± 0.071	0.61 ± 0.060	0.78 ± 0.077	0.67 ± 0.065
Sulfisoxazole				
d 5	67 ± 20	78 ± 24	69 ± 21	85 ± 26
d 24	48 ± 15	64 ± 20	57 ± 17	57 ± 17
d 45	109 ± 33	32 ± 10	44 ± 14	78 ± 24
Trimethoprim/sulfamethoxazole 1:19 ratio				
d 5	0.42 ± 0.126	0.12 ± 0.036	0.24 ± 0.074	0.24 ± 0.074
d 24	0.28 ± 0.083	0.37 ± 0.111	0.30 ± 0.091	0.21 ± 0.063
d 45	0.12 ± 0.036	0.18 ± 0.055	0.22 ± 0.068	0.18 ± 0.055

[1]Data reported as geometric mean of MIC±SEM. Fecal samples from the same 3 pigs/pen were collected on d5, 24, & 45. All antimicrobials reported, sow × nursery × day, $P < 0.05$.

Keywords: antimicrobial resistance, nursery pigs, yeast

PSIV-8 Dietary Botanical Blends Modified the Intestinal Microbiota of Weaned Pigs Experimentally Challenged with an Enterotoxigenic *E. Coli*. Cynthia N. Jinno[1], Braden Wong[1], Xunde Li[1], Emma Wall[2], Yanhong Liu[1], [1]*University of California, Davis,* [2]*AVT Natural*

Abstract: The objective of this study was to investigate the intestinal microbiota of weaned pigs when supplemented with different botanical blends while being experimentally infected with a pathogenic *E. coli*. A total of 60 weaned pigs (7.17 ± 0.97 kg) were individually housed and randomly assigned to 1 of the 5 treatments (12 pigs/treatment): sham control (CON-), challenged control (CON+), challenged botanical blend 1 with 100 ppm (BB1_100), challenged BB2 with 50 ppm (BB2_50), and challenged BB2 with 100 ppm (BB2_100). Both botanical blends were composed of capsicum oleoresin but different garlic extract varieties. The experiment lasted for 28 d including a 7-day habituation period followed by an *E. coli* oral inoculation of 10^{10} CFU/dose for 3 consecutive days. Ileal, cecal, and fecal samples were collected on d 5 and 21 post inoculation (PI) to perform 16S rRNA sequencing at the V4 hypervariable region followed by a downstream analysis using QIIME2 (v. 2020.8) and R. No difference was observed in alpha diversity among treatments and sites on d 21 PI; however, CON- had the least Shannon and Chao1 indices in ileal digesta on d 5 PI. Bray-Curtis PCoA displayed distinct clusters by treatments in the ileum and cecum on d 5 and 21 PI. On d 5 PI, *Bacteroidota* was more abundant ($P < 0.05$) in feces of BB1_100 but was the most abundant ($P < 0.05$) in ileum of CON-. Pigs in BB2 supplementation were more abundant ($P < 0.05$) in *Proteobacteria* in feces than in pigs in CON- at d 5 PI. On d 21 PI, Streptococcaceae was more abundant ($P < 0.05$) in the ileum of CON+ than of BB2_50 and Lachnospiraceae was more ($P < 0.05$) abundant in feces of pigs in BB2_100 than in BB1_100. In conclusion, supplementing botanical blend can modify the intestinal microbiota in weaned pigs challenged with a pathogenic *E. coli*.

Keywords: botanical blends, intestinal microbiota, weaned pigs