

PSIII-18 Effect of Increasing L-Lysine-HCl and Amino Acid Ratios on Performance of Finishing Pigs from 109 to 129 Kg.

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Abstract: A total of 1,789 pigs (PIC; 337×1050; initial BW 108.9 ± 1.14 kg) were used to determine the effects of increasing L-Lys-HCl and AA ratios on performance of late finishing pigs fed corn-soybean meal diets without DDGS. The study used 2 groups of pigs and each study lasted 18 and 27 d, respectively. Pigs were housed in mixed gender pens with 20 to 25 pigs/pen and 19 replications/treatment (10 and 9 replications/group, respectively). Pens of pigs were blocked by BW and randomly allotted to 1 of 4 dietary treatments. Treatment diets were formulated to 0.70% digestible Lys and consisted of low, medium, or high levels of feed-grade AA and moderate or high AA ratios relative to Lys. Low, medium and high feed-grade AA treatments had increased L-Lys-HCl (0.15, 0.30 and 0.39%) replacing soybean meal to achieve CP levels of 13.6, 12.0, and 11.0. Minimum AA:Lys ratios were 53% Ile, 128% Leu, 58% Met&Cys, 66% Thr, 18.5% Trp, 68% Val, and 34% His in Moderate AA ratio diets and 60% Ile, 128% Leu, 60% Met&Cys, 70% Thr, 21.2% Trp, 72% Val, and 33% His for the high AA ratio treatment. Overall, there was a marginally significant increase in ADFI (quadratic, $P = 0.097$) observed in pigs fed medium feed-grade AA and moderate AA ratios. Treatment diets had no effect on ADG or G:F. At the end of group 2, carcass data was collected with no differences ($P > 0.10$) observed for HCW, carcass yield, backfat depth, loin depth or percentage lean. In summary, differing levels of feed-grade AA and AA ratios used in this study did not impact growth performance or carcass characteristics of late finishing pigs with the exception of a marginally significant increase in ADFI.

Table 1. Effect of increasing L-Lysine-HCl and AA ratios on performance of finishing pigs¹

Item	Feed-grade AA/AA ratio				SEM	$P =$		
	Low	Medium	High	High		Crude protein	Linear	Quadratic
BW, kg								
Starting weight	108.9	108.6	109.0	108.9	1.14	0.874	0.124	0.809
Ending weight	128.6	128.7	128.7	128.4	0.837	0.864	0.992	0.519
Overall								
ADG, kg	0.893	0.916	0.898	0.884	0.0178	0.669	0.208	0.448
ADFI, kg	3.00	3.09	3.06	3.05	0.043	0.072	0.097	0.851
G:F	0.298	0.296	0.294	0.290	0.0044	0.479	0.934	0.472

¹BW = body weight; ADG = average daily gain; ADFI = average daily feed intake; G:F = gain-to-feed ratio.

Keywords: amino acids, finishing pig, growth

PSIII-19 Effect of Sensory Attractants Before and After Weaning on Nursery Pig Performance.

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Abstract: Two experiments were conducted using 48 litters and 711 nursery pigs to determine the effect of a powder sensory attractant (Exp. 1; Baby Pig Restart APF; TechMix Global; Stewart, MN) or enrichment cube (Exp. 2; supersized pellets resembling cattle cubes) pre- and post-weaning on feed intake and growth. Treatments were arranged in a 2x2x2 factorial with main effects of pre-weaning treatment (without/with attractant), post-weaning treatment (without/with attractant), and BW category (light/heavy). Pre-weaning treatments were assigned in a RCBD and post-weaning treatments were assigned in a CRD. Litters receiving attractant pre-weaning were provided 90 g/d of powder, divided into 2 feedings, in the pan of rotary creep feeders (Exp. 1) or 100 g of cubes once daily on the floor of farrowing stalls (Exp. 2) for 4-d prior to weaning. After weaning, pens of pigs that received attractant were offered 45 g/d of powder, divided into 2 feedings/d for 2-d (Exp. 1), or 100 g of cubes once daily (Exp. 2) top-dressed on feed in the feeder pan for 3-d post-weaning. In both experiments, pre- and post-weaning attractant had limited effects on the growth performance of pigs after weaning. In Exp. 1, the percentage of pigs that lost weight 3-d post-weaning decreased by approximately 20 percentage points when pigs were provided powder both pre- and post-weaning compared with the other 3 treatment combinations ($P = 0.015$). No differences were observed for BW category. In Exp. 2, the percentage of pigs that lost weight 7-d post-weaning decreased by 11.7 percentage points when pigs were offered cubes compared with no cubes ($P = 0.002$). On d 3, more heavyweight pigs lost weight ($P = 0.007$) than lightweight pigs; however, this effect was diminished by d 7. In summary, sensory attractants reduced the percentage of pigs that lost weight immediately after weaning which may be due to encouraged activity around the feeder.

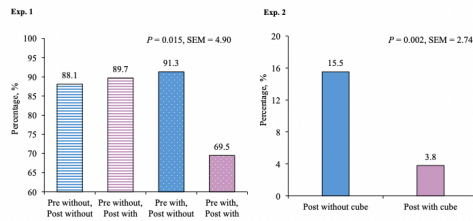


Figure 1. Interaction of pre- and post-weaning sensory attractant powder application on the percentage of pigs that lost weight from weaning to d 3 (Exp. 1). Main effect of post-weaning enrichment cube application on the percentage of pigs that lost weight from weaning to d 7 (Exp. 2).

Keywords: pig, sensory attractant, weaning

PSIII-13 Dietary Supplementation of Botanical Blends Modified Fecal Microbiota of Weaned Pigs Experimentally Infected with an Enterotoxigenic *E. Coli*. Cynthia N. Jinno¹, Braden Wong¹, Xunde Li¹, Emma Wall², Yanhong Liu¹, ¹University of California, Davis, ²AVT Natural

Abstract: The objective of this study was to investigate the fecal 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-d habituation period followed by an *E. coli* oral inoculation of 10^{10} CFU/dose for 3 consecutive days. Fecal samples were collected on d -7, 0, 5 and 21 post inoculation (PI) to perform 16S rRNA sequencing at the V4 hypervariable region. Downstream analysis was performed using QIIME2 (v. 2020.8) and R. No difference was observed among treatments throughout the experiment in alpha diversity. Bray-Curtis PCoA displayed pronounced clusters by days but also displayed overlaps when looking into day and treatment interaction. *Firmicutes* was more ($P < 0.05$) abundant in CON- than the botanical treatments while *Bacteroidetes* and *Proteobacteria* were more ($P < 0.05$) abundant in BB1_100 and BB2_50 than in CON- on d 5 PI. *Firmicutes* was less ($P < 0.05$) abundant in BB2_50 and *Proteobacteria* was more ($P < 0.05$) abundant in BB1_100 than in CON+ on d 21 PI. *Lachnospiraceae* was less abundant ($P < 0.05$) in BB2_50 than in CON- on d 5 PI and less ($P < 0.05$) abundant in BB1_100 than in CON- on d 21. In conclusion, the botanical treatments have modified the fecal microbiota of weaned pigs challenged with an enteropathogenic *E. coli*.

Keywords: botanical blends, fecal microbiota, weaned pigs