

267 Determining the effects of diet complexity and body weight categories on growth performance of nursery pigs. Raquel Lunedo¹, Dani Perondi¹, Carine Vier², Uislei Orlando², Gustavo Lima³, Ademir Junior¹, Rafael Kummer¹, ¹Master Agroindustrial, ²Genus PIC, ³Agroceres PIC

Our objective was to determine the effects of feeding complex or simple diets to nursery pigs sorted by body weight (BW) on growth performance. A total of 1,296 pigs (PIC 337×Camborough, initially 5.8±0.10 kg) were used in a 35-d study. Pens of pigs were blocked by gender and randomly allotted to 1 of 6 treatments. Treatments included three BW categories: light (4.7±0.10 kg), medium (5.8±0.10 kg), and heavy (7.1±0.10 kg); and two dietary strategies: simple (SD) or complex (CD) diets. Treatments were fed in two phases from d 0-10 and 10-20, followed by 15-d with common diet. Simple diets had greater soybean meal (20/26 vs 12/20%) and phytase levels (2,000 vs 500FTU/kg), lower specialty protein (8.1/4.2 vs 12.0/6.8%) and lactose levels (12/5.3 vs 18/11.5%) compared to CD. There were 8 or 11 pens per treatment and 24 pigs per pen. Data were analyzed using the GLIMMIX procedure of SAS with pen as the experimental unit. There was no evidence of interaction for any response criteria. During the treatment period (d 0-20), pigs fed CD had greater ($P < 0.05$) average daily gain (ADG), average daily feed intake (ADFI), and improved ($P < 0.10$) feed efficiency (G:F) compared to pigs fed SD. During the common period (d 20-35), pigs fed SD had greater ($P < 0.05$) ADG and ADFI compared to pigs fed CD. Overall (d 0-35), there was no evidence of differences in ADG, ADFI, G:F, and final BW between SD or CD. Heavy pigs had the greatest ($P < 0.05$) ADG and ADFI followed by medium and light pigs. In conclusion, pigs fed SD after weaning had poorer performance compared to pigs fed CD but were able to recover the loss in performance when switched to a common diet. This indicates nursery nutrition programs can be simplified without negatively affecting performance from 5.8 to 16.6 kg.

Table 1. Main effects of diet complexity and body weight categories on growth performance of nursery pigs

Item ^a	Body weight category			SEM	Dietary strategy		SEM
	Light	Medium	Heavy		Simple	Complex	
Treatment period (d 0 to 20)							
ADG, g	180	205	220	4.3	191 ^b	211 ^c	3.4
ADFI, g	230	262	279	5.7	250 ^b	263 ^c	4.4
G:F, g/kg	787	781	793	18.7	769	806	14.5
Common period (d 20 to 35)							
ADG, g	393 ^a	439 ^b	483 ^c	4.5	451 ^a	425 ^b	3.5
ADFI, g	552 ^a	623 ^b	694 ^c	8.2	641 ^a	608 ^b	7.1
G:F, g/kg	714 ^a	699 ^{ab}	697 ^b	9.3	705	701	8.8
Overall period (d 0 to 35)							
ADG, g	270 ^a	304 ^b	331 ^c	3.7	301	302	2.9
ADFI, g	365 ^a	416 ^b	454 ^c	6.0	415	409	5.1
G:F, g/kg	739	729	730	10.0	726	739	9.1
Body weight, kg							
d 0	4.7 ^a	5.8 ^b	7.1 ^c	0.10	5.8	5.9	0.10
d 20	8.3 ^a	9.9 ^b	11.5 ^c	0.15	9.7 ^a	10.1 ^a	0.14
d 35	14.3 ^a	16.6 ^b	18.9 ^b	0.20	16.6	16.6	0.19

^aADG = average daily gain; ADFI = average daily feed intake; G:F = gain-to-feed ratio.

^{ab}Body weight category means with different superscripts within a row differ, $P < 0.05$.

^{bc}Dietary strategy means with different superscripts within a row differ, $P < 0.05$.

Keywords: compensatory growth, diet complexity, nursery pigs

266 Dietary strategies in diets without zinc oxide for nursery pigs. Fernanda Laskoski¹, Wade M. Hutchens¹, Mike D. Tokach¹, Jason C. Woodworth², Robert D. Goodband¹, Steve S. Dritz¹, Joel M. DeRouchey¹, ¹Kansas State University, ²Department of Animal Sciences & Industry, College of Agriculture, Manhattan, KS 66506

A total of 300 pigs (DNA 241 × 600; initially 4.2 kg) were used to evaluate the effects of different nutritional strategies to replace zinc oxide (ZnO) in nursery diets. Treatments consisted of A) Positive control (21% CP; ZnO providing 3,000 ppm Zn from d 0 to 7, and 2,000 ppm Zn from d 7 to 25); B) Negative control (NC; no ZnO); C) NC plus 1.2% Na diformate; D) NC with 4% coarse ground wheat bran; E) NC with low crude protein (18%) by adding high levels of feed grade amino acids; and F) the combination of NC with 18% crude protein (CP), 1.2% Na diformate, and 4% coarse ground wheat bran. There were 5 pigs per pen and 10 pens per treatment in a completely randomized design. Data were analyzed with the Proc Mixed procedure in SAS. For the overall period (d 0 to 46), pigs fed diets containing ZnO had greater ($P < 0.001$) ADG, ADFI, and final BW than other treatments, with pigs fed the NC with 18% CP having the lowest performance. Pigs fed the NC diet without any nutritional alternative had the lowest fecal dry matter (DM; $P < 0.050$) and highest fecal scores ($P < 0.050$). Pigs fed diets with ZnO had similar fecal DM and scores as pigs fed the diet containing the combination of 1.2% Na diformate, 4% coarse ground wheat bran, and low (18%) CP, but greater ($P < 0.023$) fecal DM than pigs fed the alternatives used individually. This study suggests none of the strategies used alone were effective at replacing ZnO while the use of low CP and amino acids reduced performance further. Combining the three alternatives tested as a replacement to ZnO improved fecal DM content and fecal score but did not result in improved growth performance.

Table 1. Effects of water quality on nursery pig performance.

Item	Water Quality Treatment ¹			SEM	P
	A	B	C		
No. of pens	15	15	15	-	-
No. of pigs	150	150	150	-	-
Initial BW, kg	6.17	6.22	6.34	0.146	0.715
Final BW, kg	24.59	24.57	25.34	0.446	0.386
ADG, kg	0.46	0.46	0.48	0.008	0.404
ADFI, kg	0.64	0.65	0.68	0.013	0.722
G:F	0.33	0.32	0.33	0.003	0.805
No. pigs treated	9	5	8	-	0.472
Scour score, d 7	1.93	1.93	1.87	0.147	0.934

¹ A, B, and C represent water of differing quality (see text) sourced from different farms in Minnesota.

Keywords: acidifier, wheat bran, zinc oxide