

**247 The Effect of Feeding Low Complexity Diets Contaminated with Deoxynivalenol and Supplemented with Nutramix™ or Fish Oil on Nursery Pig Growth Performance.**

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Three hundred twenty newly weaned pigs (6.7±0.3 kg BW) were used to determine the effect of low complexity diets contaminated with deoxynivalenol (DON) and supplemented with NutraMix™ or fish oil on nursery pig growth performance. Pigs were randomly divided into 40 pens and assigned to 1 of 5 dietary treatments (n = 8): [1] high-complexity diet containing animal proteins (HC) or one of four low complexity diets with protein supplied only by corn and soybean meal with [2] no DON contamination (LC), or [3] DON contamination of 3 ppm without supplements (DON-), [4] with NutraMix™ supplementation (2 g/kg; DONNM), or [5] with fish oil supplementation (2.5%, as-fed; DON $\omega$ 3). Diets were fed over two phases (7 and 15 days, respectively) and a common phase III diet was fed to all pigs for 20 days. In phase I, ADG, ADFI, and G:F were not different between pigs fed the HC and LC diets, but were lower for pigs fed DONNM and DON $\omega$ 3 (P < 0.05). In phase II, pigs fed the DON- and DON $\omega$ 3 diets had lower ADG than LC (375 vs. 410 g/d; P < 0.05) and lower ADFI than HC (452 vs. 519 g/d; P < 0.05), while pigs fed DON- and DON $\omega$ 3 had greater G:F than those fed HC (0.83 vs. 0.78; P < 0.05). The BW at the end of phase II were not different between HC and LC (13.0 kg), but tended to be less for DON $\omega$ 3 (12.6 kg; P = 0.084 and 0.079, respectively). In phase III and over the entire nursery period, there were no treatment effects on ADG, ADFI, G:F, or final BW (26.0±0.7 kg). Feeding low complexity diets contaminated with 3 ppm DON initially reduced growth performance, but pigs were still able to achieve BW not different from HC pigs at the end of the nursery period, regardless of supplementation.

**Keywords:** compensatory growth, nursery pig, deoxynivalenol

**244 Effect of Fiber Source and Crude Protein Level on Nursery Pig Performance.**

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A total of 360 pigs (DNA 200'400, initially 5.0 kg) were used in a 45-d growth trial to determine the effects of fiber source and crude protein (CP) level in diets without pharmacological levels of ZnO on nursery pig growth performance and fecal dry matter (DM). Pigs were randomly assigned to 1 of 8 treatments with 5 pigs/pen and 9 pens/treatment. Treatments were arranged in a 2×4 factorial with main effects of CP (21 or 18%) and fiber source [none, coarse wheat bran (CWB), oat hulls, or cellulose (Arbocel, J. Rettenmaier USA, Schoolcraft, MI)]. Fiber source was added to equalize the level of insoluble fiber contributed from 4% CWB, resulting in the addition of 1.85% oat hulls or 1.55% cellulose. Diets were fed in two phases (d 0 to 10 and 10 to 24) followed by a common diet (d 24 to 45). The 21% CP diets contained 1.40% SID Lys in phase 1 and 1.35% SID Lys in phase 2. Treatment diets were formulated to a maximum SID Lys:digestible CP level of 6.35%, thus SID Lys decreased in the 18% CP (1.25% SID Lys) diets. Data were analyzed using the lmer function in R. No fiber source × CP level interactions (P > 0.05) were observed. Decreasing dietary CP decreased (P = 0.05) ADG, G:F, and d 24 BW. Overall, ADG and d 45 BW decreased (P < 0.05) for pigs fed 18% CP diets. No main effects of fiber source were observed for growth performance throughout the study. Fecal DM increased (P < 0.05) for pigs fed added cellulose compared to pigs fed no fiber or CWB in the experimental period. In conclusion, reducing dietary CP decreased growth performance and the inclusion of cellulose improved fecal DM of nursery pigs.

**Table 1. Main effects of fiber source and crude protein (CP) on nursery pig performance<sup>1</sup>**

Item	CP			Fiber source <sup>2</sup>				SEM
	21%	18%	SEM	None	Wheat bran	Oat hull	Cellulose <sup>3</sup>	
Body weight, kg								
d 24 <sup>6</sup>	10.2	9.7	0.20	10.0	9.9	9.9	10.0	0.23
d 45 <sup>6</sup>	21.9	21.2	0.37	21.8	21.6	21.1	21.7	0.44
d 0 to 24 (experimental period)								
ADG <sup>4,6</sup> , g	218	197	10.0	208	207	204	211	11.0
ADFI <sup>4</sup> , g	284	271	14.9	275	280	275	280	15.8
Gain:feed <sup>4</sup> , g/kg	768	725	7.1	755	738	742	752	10.0
d 0 to 45								
ADG <sup>5</sup> , g	374	359	9.4	372	368	355	371	10.8
ADFI, g	509	495	19.9	504	506	489	509	21.0
Gain:feed, g/kg	735	727	11.0	740	728	728	729	11.6
Fecal dry matter, %								
d 24 <sup>5,7</sup>	22.3	23.3	0.40	22.1 <sup>b</sup>	21.6 <sup>b</sup>	22.7 <sup>ab</sup>	24.7 <sup>a</sup>	0.57
d 45	26.4	26.2	0.46	27.0	26.8	26.0	25.3	0.65

<sup>ab</sup>Means in the same row with different superscripts differ ( $P < 0.05$ ).

<sup>1</sup>No fiber source  $\times$  CP level interactions ( $P > 0.05$ ) were observed throughout the study.

<sup>2</sup>Analyzed insoluble fiber values for coarse wheat bran, oat hulls, and cellulose were used in diet formulation to provide a similar amount of insoluble fiber in all diets that contained a fiber source by balancing the insoluble fiber content provided by 4% coarse wheat bran.

<sup>3</sup>Arbocel (J. Rettenmaier USA, Schoolcraft, MI).

<sup>4</sup>ADG = Average daily gain. ADFI = Average daily feed intake.

<sup>5</sup>Experimental diets were fed from d 0 to 24 and a common diet was fed from d 24 to 45.

<sup>6</sup>Main effect of CP ( $P < 0.05$ ).

<sup>7</sup>Main effect of fiber source ( $P < 0.05$ ).

**Keywords:** crude protein, fecal dry matter, insoluble fiber

## 243 Effects of Initial Nursery Diet Budget on Growth Performance of 5.5- to 23-kg Pigs.

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An experiment was conducted to determine the effects of the initial nursery diet budget on growth performance. A total of 3,264 pigs (initial BW = 5.5 kg), placed in pens with 51 pigs each, were used in a 45-d trial. There were 4 treatments consisting of different feed budgets of the initial nursery diet: 4.1 kg, 5.4 kg, 6.8 kg, or 8.2 kg. The experimental diet was corn, soybean meal, and whey permeate-based and contained 1.38% SID Lys. After the allocated budget was consumed, pigs were provided a common corn and soybean meal-based diet. There were 16 replicates per treatment. Pigs were weighed weekly to calculate ADG, ADFI, and G:F. Data were analyzed with SAS MIXED procedure. In the first 14 d of the trial there was no evidence for differences ( $P > 0.10$ ) in growth performance as all pigs were receiving their allocated budget of the initial diet. From d 14 to 21 as well as d 0 to 21, pigs that received a budget of 6.8 or 8.2 kg had improved ADG (quadratic,  $P < 0.05$ ) and G:F (linear,  $P < 0.05$ ) compared to those fed budgets of 4.1 or 5.4 kg. From d 21 to 45, when all pigs received a common diet, there was no evidence for differences ( $P > 0.10$ ) in ADG. However, there was a linear response ( $P < 0.05$ ) in G:F, with pigs previously fed the lowest feed budget presenting improved G:F. Overall (d 0 to 45), there was an improvement (linear,  $P < 0.05$ ) in ADG and ADFI as feed budgets increased, with the best performance observed when pigs were fed 6.8 or 8.2 kg of the initial nursery diet. In conclusion, providing a 6.8 or 8.2 kg budget of the initial nursery diet resulted in improved overall nursery performance.

**Table 1. Effects of initial nursery diet budget on growth performance<sup>1</sup>**

Item <sup>2</sup>	Initial diet budget, kg				SEM	Probability, $P <$	
	4.1	5.4	6.8	8.2		Linear	Quadratic
BW, kg							
d 0	5.5	5.5	5.5	5.5	0.06	0.938	0.989
d 14	8.5	8.6	8.7	8.6	0.15	0.483	0.575
d 21	10.3	10.7	11.1	11.0	0.17	0.002	0.123
d 45	22.9	23.1	23.8	23.7	0.30	0.031	0.640
d 0 to 14							
ADG, g	210	217	222	219	6.94	0.284	0.443
ADFI, g	212	216	221	217	6.00	0.475	0.550
G:F	0.987	1.001	1.008	1.008	0.010	0.133	0.467
d 14 to 21							
ADG, g	268	319	366	358	8.30	0.001	0.001
ADFI, g	405	415	438	409	9.16	0.425	0.032
G:F	0.662	0.769	0.836	0.875	0.022	0.001	0.135
d 0 to 21							
ADG, g	228	249	268	263	5.83	0.001	0.031
ADFI, g	273	279	289	278	6.30	0.364	0.158
G:F	0.835	0.892	0.927	0.946	0.010	0.001	0.061
d 21 to 45							
ADG, g	526	514	530	526	6.89	0.589	0.597
ADFI, g	690	690	720	715	9.99	0.020	0.840
G:F	0.762	0.745	0.736	0.736	0.005	0.001	0.071
d 0 to 45							
ADG, g	387	390	408	403	5.74	0.011	0.547
ADFI, g	493	496	517	510	7.70	0.042	0.478
G:F	0.785	0.786	0.789	0.790	0.003	0.109	0.529

<sup>1</sup>A total of 3,264 pigs were used with 16 replicates per treatment. After the allocated feed budget was consumed, pigs were fed a common corn and soybean meal-based diet.

<sup>2</sup>BW = body weight. ADG = average daily gain. ADFI = average daily feed intake. G:F = gain-to-feed ratio.

**Keywords:** budget, growth, nursery