

## 264 Effects of Low Dietary Crude Protein Diets Containing Coarse Wheat Bran as an Alternative to Zinc Oxide in Nursery Pig

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An experiment was conducted to determine the effect of reduced crude protein (CP) in diets containing coarse wheat bran (CWB) without pharmacological levels of Zn (ZnO) on growth performance and fecal dry matter (DM) of nursery pigs. A total of 650 pigs (DNA 241'600; initially 6.6 kg), were used with 5 pigs/pen and 26 replicate pens/treatment. Pens were assigned to 1 of 5 treatments in a RCB design based on BW. Treatments were fed for 13-d, contained 4% CWB, and consisted of: 1) diet with pharmacological ZnO (2,000 mg/kg Zn) and 21% CP formulated to 1.35% standardized ileal digestible (SID) Lys; 2) a diet with 110 ppm added Zn and 21% CP (1.35% SID Lys); 3) a diet with 110 ppm added Zn formulated to 18% CP (1.20% SID Lys); 4) an 18% CP diet with 110 ppm added Zn formulated to 1.35% SID Lys by the addition of increased levels of feed grade amino acids; and 5) diet 4 with addition of non-essential amino acids (NEAA; glycine and glutamic acid). Data were analyzed using the lmer function in R. Overall, pigs fed 21% CP with ZnO had increased ( $P < 0.05$ ) ADG compared to those fed 18% CP (1.35% SID Lys) with high levels of feed grade amino acids or those fed the reduced SID Lys (1.2%) diet. Gain-to-feed ratio was increased ( $P < 0.05$ ) for pigs fed 21% CP diets and those fed the 18% CP diet with NEAA compared to pigs fed 1.2% SID Lys and pigs fed high levels of feed grade amino acids. Fecal DM was increased ( $P < 0.05$ ) for pigs fed reduced SID Lys diet. In conclusion, reducing CP (subsequently SID Lys) in diets without ZnO decreased growth performance but increased fecal DM.

**Table 1. Effect of reducing dietary crude protein (CP) content with supplemented essential or non-essential amino acids on nursery pig performance<sup>1</sup>**

Item	21% CP <sup>2</sup>		18% CP, No ZnO			SEM
	ZnO <sup>6</sup>	No ZnO	1.2% Lysine <sup>3</sup>	1.35% Lysine <sup>4</sup>	1.35% Lysine + NEAA <sup>5</sup>	
d 0 to 13						
ADG <sup>6</sup> , g	429 <sup>a</sup>	417 <sup>ab</sup>	386 <sup>bc</sup>	378 <sup>c</sup>	393 <sup>abc</sup>	12.2
ADFI <sup>6</sup> , g	598	586	601	592	565	17.2
Gain:feed, g/kg	719 <sup>a</sup>	713 <sup>a</sup>	642 <sup>b</sup>	640 <sup>b</sup>	695 <sup>a</sup>	10.1
Fecal dry matter, %						
d 13	18.0 <sup>ab</sup>	17.2 <sup>b</sup>	19.2 <sup>a</sup>	18.1 <sup>ab</sup>	18.2 <sup>ab</sup>	0.51

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

<sup>1</sup>A total of 650 pigs (Line 241 × 600, DNA, Columbus, NE, initial BW of 6.6 kg) were used in a 13-d growth study with 5 pigs per pen and 26 pens per treatment. All diets contained 4% coarse wheat bran.

<sup>2</sup>Formulated to 21% CP (1.35% SID Lys) with or without 2,000 mg/kg Zn.

<sup>3</sup>Formulated to 18% CP and 1.2% SID Lys by adding feed grade amino acids until the minimum Ile:Lys requirement of 52% was met.

<sup>4</sup>Formulated to 18% CP and 1.35% SID Lysine with high amounts of feed grade amino acids. L-Ile and L-His were added along with other feed grade amino acids.

<sup>5</sup>Formulated to 18% CP and 1.35% SID Lys with high amounts of feed grade amino acids and with the addition of non-essential amino acids (glycine and glutamic acid).

<sup>6</sup>ZnO = zinc oxide. ADG = average daily gain. ADFI = average daily feed intake.

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