

PSVIII-4 Effect of coarse wheat bran and crude protein level in nursery diets without zinc oxide on pig performance. Kelsey L.

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A total of 355 pigs (DNA 200x400; initially 5.6 kg) were used to evaluate the effects of coarse wheat bran and crude protein (CP) level in diets without pharmacological levels of zinc oxide on nursery pig performance and fecal dry matter (DM%). Pigs were allotted to 1 of 6 treatments in a completely randomized design with 5 pigs per pen and 12 pens per treatment. Treatment diets were fed in two phases (d 0 to 7 and 7 to 21) followed by a common diet fed d 21 to 45. Treatments included a positive control diet with ZnO, negative control without ZnO, and negative control with 4% wheat bran and formulated to contain 21, 19.5, 18, or 16.5% CP. All diets contained 1.35% SID lysine except the 18 and 16.5% (1.25 and 1.20% lysine) CP diets. Data were analyzed using the lmer function from the lme4 package in R. During the experimental period, decreasing CP decreased (linear, $P < 0.05$) ADG, G:F, and d 21 BW, but increased (linear, $P = 0.005$) fecal DM%. Pigs fed the diet containing ZnO had increased ($P < 0.050$) ADG, ADFI, and G:F compared to the negative control and diet with 21% CP and wheat bran. From d 21 to 45, pigs previously fed the 21% CP diet with wheat bran had increased ($P < 0.05$) ADG compared to the positive control. Fecal DM on d 45 and G:F increased ($P < 0.05$) for pigs fed the 21% CP, wheat bran diet and negative control compared to those fed the positive control. Overall, pigs fed low CP diets had decreased ($P < 0.05$) ADG while pigs fed the positive control had greater ($P < 0.05$) ADG compared to the negative control. Additional research is needed to determine if modifying low CP, wheat bran diets will elicit benefits of increased fecal DM% while maintaining growth performance.

Table 1. Effect of coarse wheat bran and crude protein (CP) level in nursery diets without zinc oxide on pig performance

Item	Control ¹		4% Coarse wheat bran				SEM
	+ ²	-	21% CP	19.5% CP	18% CP	16.5% CP	
d 0 to 21 (experimental period)							
ADG ¹ , g ^{hbc}	314	248	253	247	222	220	19.31
Gain:feed, g/kg ^{abc}	851	795	792	767	757	725	27.01
d 21 to 45 (common diet)							
ADG, g ^c	611	624	640	625	632	622	9.239
Gain:feed, g/kg ^{bc}	643	673	664	665	680	674	9.687
d 0 to 45							
ADG, g ^{ab}	473	448	457	448	440	433	11.09
Gain:feed, g/kg	696	701	693	689	697	685	4.842
Fecal Dry Matter, %							
d 21 ^a	20.6	19.1	19.9	21.3	22.5	22.8	0.770
d 45 ^{abc}	23.2	26.0	25.6	23.9	23.1	22.6	0.702

¹ Linear effect ($P < 0.05$) to CP level in diets containing coarse wheat bran.

² Positive control vs. negative control means differ ($P < 0.05$).

³ Positive control vs. 21% CP diet with wheat bran means differ ($P < 0.05$).

⁴ Both positive and negative control diets were formulated at 21% CP.

⁵ ZnO was included in the diet to provide 3,000 ppm of Zn from d 0 to 7; 2,000 ppm of Zn from d 7 to 21; and no additional Zn other than that from the TM premix from d 21 to 45.

⁶ ADG = Average daily gain.

Keywords: coarse wheat bran, nursery pig, zinc oxide