PSIII-15 Effect of the Pelleting Process on Diet Formulations with Varying Levels of Crystalline AA and Reducing Sugars on Nursery Pig Growth Performance.

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A total of 360 pigs (DNA 200×400; initially 11.3 kg) were used in an 18-d study to determine the effect of pelleting diets with or without increased concentrations of free amino acids (AA) and reducing sugars (RS) on pig growth performance. There were 9 replications/treatment and 5 pigs/pen. Treatments were arranged in a 2×2×2 factorial with main effects of diet form (mash vs. pellet), crystalline AA (low vs. high), and RS (low vs. high) provided by dried distillers grain with solubles and bakery meal included at 20% and 15%, respectively. Diets were pelleted to achieve a conditioning temperature of 86.7°C using a 22.4 kW pellet mill equipped with a 4.7 x 34.9-mm die. Data were analyzed as a CRD using the GLIMMIX procedure of SAS. There were no 3-way interactions observed. For the main effect of feed form, ADFI decreased (P=0.001) and G:F and caloric efficiency improved (P=0.001) in pigs fed pelleted diets compared to mash diets. For the main effect of crystalline AA, pigs fed diets with high crystalline AA had increased (P< 0.024) ADFI compared to those fed diets with low crystalline AA. For the main effect of RS, pigs fed high RS diets had decreased (P< 0.041) ADG, ADFI, G:F, and caloric efficiency compared to those fed low RS. In conclusion, there was no evidence of interactions between treatments, indicating that increasing amounts of crystalline AA and RS did not influence the response to pelleted diets. Pigs fed the high RS diets had reduced feed intake which resulted in reduced gain and improved feed and caloric efficiency.

Table 1. Main effects of the pelleting process on diet formulations with varying levels of crystalline amino acids (AA) and reducing sugars (RS) on nursery pig growth, [1,2]

	Form		Crystalline AA		RS		
Item	Mash	Pellet	Low	High	Low	High	SEM
BW, kg							
d0	11.3	11.4	11.4	11.3	11.4	11.3	0.19
d18	21.9	21.7	21.8	21.8	22.1	21.6	0.26
d 0 to 18							
ADG, g	574	572	568	577	587[e]	559[f]	9.5
ADFI, g	962[a]	878[b]	900[c]	940[d]	960[e]	881[f]	12.2
G:F	0.60[b]	0.65[a]	0.63	0.62	0.61[f]	0.64[e]	0.006
Caloric efficiency, NE kcal/kg of gain[6]	4297[a]	3938[b]	4062	4173	4191[e]	4044[f]	43.1

[1] A total of 360 pigs (DNA 200 × 400; initially 11.3 kg) were used in an 18-d growth trial with 5-pigs/pen in a completely randomized design.
[2] Dietary treatments were arranged in a 2×2×2 factorial with main effects of crystalline AA inclusion (low vs. high), reducing sugar inclusion (low vs. high), and diet form (mash vs. pellet).
[a,b] Means within row for the main effect of form (mash vs. pellet) differ (P<0.05).
[c,d] Means within row for the main effect of crystalline AA (low vs. high) differ (P<0.05).
[e,f] Means within row for the main effect of RS (low vs. high) differ (P<0.05).
[6] Caloric efficiency = (ADFI, kg × NE, kcal/kg (2555 kcal/kg)/ADG, kg.

Keywords: amino acids, reducing sugars, pelleting