Response to Dietary Energy Concentration and Stocking Density in Weaned Pigs

Crystal L. Levesque [1] *M.Sc.*, John. F. Patience *Ph.D.*, Eduardo Beltranena *Ph.D.*, Ruurd T. Zijlstra *Ph.D.*

Summary

Understanding the effect of energy intake on growth performance and body composition of pigs is critical for the development of economical feeding strategies. However, knowledge is limited on the influence of varying amounts of DE content on growth and body composition according to the growth potential of the pig. A study was conducted to examine the effect of increasing dietary digestible energy (DE) concentration on weaned pig performance at the farm level. Results indicate that higher dietary DE concentration may not improve weaned pig performance.

Introduction

Gut capacity is assumed to be the primary limitation to growth in the young pig because it limits their daily energy intake. Thus, concentrating dietary DE has been assumed to be an effective way to overcome this limitation in gut size. However, increasing dietary DE concentration increases the cost of the diet. In a previous study, increasing DE concentration did not result in improved pig performance. This lack of response to increased dietary DE may have been due to the absence of external stressors. Commercial groups of pigs are under additional stressors such as crowding. Crowding is known to negatively affect pig performance. Concentrating dietary DE may have a greater impact on weaned pig performance in the presence of external stressors.

Experimental procedure

Piglet response to dietary DE concentration and stocking density was studied in 600 pigs weaned at 19 days of age. Pigs were assigned to a low (3.75 ft^2/pig) or a high (2.50 ft^2/pig) stocking density and one of five dietary DE concentrations (3.19, 3.33, 3.47, 3.61, 3.75 Mcal DE/kg). Pigs received commercial starter diets from 19 to 25 days of age and experimental diets from 25 to 53 days of age. Body weight and feed disappearance were measured weekly. Cost per kg of gain was calculated using overall gain and feed intake.

Results

Final pig body weight (20.25 kg ± 0.06 SEM) was not affected by diet or stocking density. However, from 46 to 53 days of age, pigs at the low stocking density had higher feed intake (0.93 vs. 0.88 kg/d) and higher daily gain (0.67 vs. 0.62 kg/d) than crowded pigs. Feed intake decreased (0.64, 0.64, 0.63, 0.63, 0.59 kg/d) and feed efficiency (0.74, 0.75, 0.78, 0.79, 0.80) improved with increasing dietary DE concentration. Overall, piglet gain did not improve with increased dietary DE concentration, regardless of stocking density. Cost per kg of gain was greatest for the highest DE diet (0.48, 0.50, 0.50, 0.50, 0.51 $/kg gain).

Conclusions

A high stocking density can negatively impact piglet performance. In this study, crowded pigs had a 9.2% slower growth rate than the uncrowded pigs during the last week of the experiment. The weanling pig was able to compensate for reduced dietary DE through increased feed intake. Growth limitations in the weanling pig are not overcome simply be increasing dietary DE concentration. The increased cost of the high DE diets and hence increased cost per kg of gain may not justify the use of higher DE diets in weaner pigs.

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Table 1. **Pig performance and cost of gain from 25 to 53 d of age**

DE level, Mcal DE/kg	3.19	3.33	3.46	3.61	3.75
ADG, kg/d	0.47	0.47	0.48	0.49	0.47
ADFI, kg/d*	0.64	0.64	0.63	0.63	0.59
Feed efficiency**	0.75	0.76	0.78	0.79	0.80
$/tonne[a]	352.15	368.51	380.27	391.49	404.41
$/kg gain[a]	0.48	0.50	0.50	0.50	0.51

[a]Cost in $/tonne and $/kg gain was calculated using the following ingredient prices – wheat: $110.00; barley: $85.00; Soybean meal: $328.00

* $P < 0.05$, ** $P < 0.001$

[1] PSCI and Department of Animal and Poultry Science, University of Saskatchewan