Effects of high fibre on gas production and net energy in diets fed to group-housed pigs

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The objective was to test the null hypothesis that a high-fibre diet does not affect gas production or net energy (NE) in pigs. One diet was formulated based on corn and soybean meal with normal fibre concentration. The second diet contained 33% wheat middlings and had an elevated level of fibre. A total of 24 growing pigs (initial weight = 40.9 kg; standard deviation = 1.72) were allotted to the 2 diets using a 2-period switch back design with 6 calorimetry chambers (4 pigs/chamber) and 2 periods. Pigs had free access to feed and water. Fecal and urine materials were quantitatively collected and consumption of O2 and production of CO2 and CH4 were measured for 6 d. After collection, pigs were deprived of feed for 48 h and O2 consumption, CO2 and CH4 synthesis, and urine N were measured to determine fasting heat production. The statistical model included diet as the fixed effect. Results indicated that apparent total tract digestibility of gross energy and concentration of NE were reduced ($P<0.01$) in the high-fibre diet compared with the normal-fibre diet. Respiratory quotient was greater ($P<0.01$) if pigs were fed the normal-fibre diet than the high-fibre diet. When the gas consumption and production were corrected for feed intake, the CH4 production was greater ($P<0.05$) in the high-fibre diet, which is associated with greater fermentation in pigs. Total heat production was greater ($P<0.01$) in the normal-fibre diet compared with the high-fibre diet, indicating that the metabolic activity in pigs was increased by greater energy and nutrients available from the normal-fibre diet. In conclusion, feeding pigs with the high-fiber diet reduced NE in diet because wheat middlings has lower energy digestibility and increases fermentation.

A review on the lysine requirements of weaned piglets

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Optimizing pig health and production efficiency and minimizing N excretion requires accurate knowledge of lysine requirements. This study aimed to determine standardized ileal digestible (SID) lysine requirements of weaned piglets (5-30 kg) based on a literature review using meta-analytical approaches. The literature review yielded 344 studies that were screened for title and abstract. In total, 41 experiments met the inclusion criteria, resulting in a dataset of 206 treatment groups. Linear, quadratic and linear-plateau models were used to obtain insight in the effect of SID lysine content on average daily gain and feed efficiency for the combined dataset and for individual experiments. For the combined dataset, both the dietary lysine content and the response criteria were standardized. Regression analysis showed a predominantly linear increase in average daily gain and feed efficiency in response to increasing lysine levels across both the combined dataset and individual experiments. Breakpoint estimation from the linear-plateau models was inconclusive, indicating that the optimal SID lysine requirement to maximize piglet growth performance likely exceeded the upper lysine levels tested in most studies, surpassing 1.3 g SID lysine per MJ net energy. This review indicates a high value for the dietary lysine content required to maximize growth performance. Results may also suggest that piglet feed formulation should focus on an optimal dietary SID lysine to crude protein ratio, rather than SID lysine per kg of diet or unit of net energy.