The performance of grower-finisher pigs fed diets with declining crude protein content

J.F. Patience[1], A.D. Beaulieu[1], R.T. Zijlstra[1], D.A. Gillis[1] and J. Usry[2]

[1]Prairie Swine Centre Inc., P.O. Box 21057, 2105 8th St. E. Saskatoon, SK S7H 5N9; [2]Ajinomoto Heartland Inc., Chicago, IL; *Email*: beaulieu@sask.usask.ca.

Decreasing nitrogen excretion in swine manure is possible with a reduction in the crude protein (CP) content of the diet. Average daily gain can be maintained on reduced CP diets with the appropriate inclusion of synthetic amino acids (AA), which is now feasible with the increased availability and reduced cost of these AA. Carcass quality however, is a problem when growing-finishing pigs are fed low CP diets. The objective of this experiment was to examine the performance and carcass composition of swine fed diets formulated to meet AA requirements but with reduced CP content. Diets were based on barley, wheat and soybean meal, and were formulated on the basis of net (NE) rather than metabolizable energy (ME). A high CP treatment (HiCP) typical of commercial diets and containing less than 0.1% L-lysine-HCl, was compared to a low CP treatment (LoCP) formulated to meet AA requirements using maximal amounts of L-lysine-HCl, L-threonine, and DL-methionine without using other synthetic AA. A third series of diets was formulated to be intermediate between the HiCP and LoCP diets. The CP content of the LoCP diet was reduced by about 2 percentage points relative to the HiCP diet. Diets were fed in 3 phases.

Treatment had no effect on ADG, ADFI, feed efficiency, days to market, lean yield, fat thickness, premiums, or final carcass value ($P>0.05$). Gilts gained less than barrows (0.945 vs. 0.973 kg/d; $P<0.03$), consumed less feed (2.57 vs 2.78 kg/d; $P<0.001$) and had an improved feed efficiency ($P<0.001$). Feeding a LoCP AA supplemented diet resulted in 2 mm greater loin thickness compared to the HiCP diet ($P<0.004$). Using current prices, the ratio of carcass value to feed cost was 2.36 on all diets for barrows, but for gilts, this ratio ranged from 2.61 (LoCP) to 2.35 (HiCP).

Implications:
Growth performance and carcass value of pigs can be maintained while feeding a low CP, AA supplemented diet if formulated on the basis of NE.