219 Requirements for digestible Ca by growing pigs.

J. C. González-Vega[*1], C. L. Walk[2], H. H. Stein[3], *[1]University of Illinois, Urbana, [2]AB Vista, Marlborough, United Kingdom, [3]University of Illinois at Urbana-Champaign, Urbana.*

Nine experiments were conducted toward developing a system for determining digestible Ca requirements in growing pigs. In Exp. 1, it was demonstrated that there is a considerable loss of absorbed Ca in the intestinal tract, which indicates that values for digestible Ca need to be based on standardized digestibility. Experiment 2 was conducted to determine where in the intestinal tract Ca is absorbed and results indicated that Ca is absorbed in the small intestine and no absorption of Ca takes place in the large intestine. No differences were observed between ileal and total tract digestibility values, therefore, total tract collections can be used to determine digestibility of Ca. Experiments 3, 4, and 5 were conducted to establish standard total tract digestibility (STTD) values of Ca in a number of feed ingredients without and with microbial phytase. Results indicated that microbial phytase increases STTD of Ca in calcium carbonate and fish meal, but not in dicalcium phosphate and monocalcium phosphate. Experiments 6 and 7 were conducted to determine the STTD Ca requirements by 11 to 25 kg pigs. Six diets were formulated to contain 0.32, 0.40, 0.48, 0.56, 0.64, or 0.72% STTD Ca and 0.36% STTD P. Results indicated that the concentration of STTD Ca in the diets needed to maximize bone ash was 1.33 times the concentration of STTD P. Experiments 8 and 9 were conducted to determine the requirement for STTD Ca and STTD P by 25 to 50 kg pigs. A total of 20 diets were formulated to contain 0.13, 0.27, 0.42, 0.57, or 0.72% STTD Ca and 0.15, 0.31, 0.39, or 0.47% STTD P. Results indicated that the concentration of dietary STTD Ca needed to maximize growth performance was between 1.06 and 1.43 times the concentration of STTD P, but to maximize bone ash, dietary STTD Ca needs to be between 1.47 and 1.80 times the concentration of STTD P. In conclusion, diets for growing pigs may be formulated using values for STTD of Ca in feed ingredients. If diets are formulated to meet STTD Ca and STTD P requirements, it is expected that the utilization of both minerals is maximized. Additional research is needed to determine the STTD Ca requirements by pigs above 50 kg BW.

Key Words: digestible calcium, requirements, pig