

Effects of beta-mannanase addition to corn-soybean meal diets on growth performance, carcass traits, and nutrient digestibility of weanling and growing-finishing pigs.

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Abstract

Four experiments were conducted to determine the effects of adding a beta-mannanase preparation (Hemicell, ChemGen, Gaithersburg, MD) to corn-soybean meal-based diets on growth performance and nutrient digestibility of weanling and growing-finishing pigs. In Exp. 1, 156 weanling pigs (20 d, 6.27 kg BW) were allotted to four dietary treatments in a randomized complete block design. Treatments were a factorial arrangement of diet complexity (complex vs simple) and addition of 3-mannanase preparation (0 vs 0.05%). Pigs were fed in three dietary phases (Phase 1, d 0 to 14; Phase 2, d 14 to 28; and Phase 3, d 28 to 42). Pigs fed complex diets gained faster and were more efficient ($P < 0.05$) during Phase 1 compared with pigs fed simple diets. Overall, gain:feed ratio (G:F) tended to be improved ($P < 0.10$) for pigs fed complex diets and it was improved ($P < 0.01$) for those fed diets with beta-mannanase. In Exp. 2, 117 pigs (44 d, 13.62 kg BW) were allotted randomly to three dietary treatments. Dietary treatments were 1) a corn-soybean meal-based control, 2) the control diet with soybean oil added to increase metabolizable energy (ME) by 100 kcal/kg, and 3) the control diet with 0.05% beta-mannanase preparation. Beta-mannanase or soybean oil improved ($P < 0.05$) G:F compared with pigs fed the control diet. In Exp. 3, 60 pigs (22.5 kg BW) were allotted randomly to the three dietary treatments used in Exp. 2. Dietary treatments were fed in three phases (23 to 53 kg, 53 to 82 kg, and 82 to 109 kg with 0.95, 0.80, and 0.65% lysine, respectively). Overall, the addition of soybean oil tended to improve G:F ($P < 0.10$) compared with that of pigs fed the control diet, and G:F was similar ($P > 0.54$) for pigs fed diets with soybean oil or beta-mannanase. Also, addition of beta-mannanase increased ADG ($P < 0.05$) compared with that of pigs fed the control or soybean oil diets. There were no differences ($P > \text{or} = 0.10$) in longissimus muscle area or backfat; however, on a fat-free basis, pigs fed the diet with beta-mannanase had greater ($P < 0.05$) lean gain than pigs fed the control or soybean oil diets. In Exp. 4, 12 barrows (93 kg BW) were allotted randomly to one of the three dietary treatments used in Exp. 3. Addition of 3-mannanase had no effect ($P > 0.10$) on energy, nitrogen, phosphorus, or dry matter digestibility. These results suggest that beta-mannanase may improve growth performance in weanling and growing-finishing pigs but has minimal effects on nutrient digestibility.

Citation: Petty, L.A., Carter, S.D., Senne, B.W., and Shriver, J.A., *Effects of beta-mannanase addition to corn-soybean meal diets on growth performance, carcass traits, and nutrient digestibility of weanling and growing-finishing pigs*. 2002 J. Anim Sci, 80: 1012-1019