Evaluation of a microbially-converted soybean meal as a substitute for fishmeal and a dietary acidifier in nursery pig diets and its effect on post-weaning diarrhea

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Scientific Abstract. Six ileal-cannulated pigs (30.0 ± 1.6 kg body weight) and 31 nursery pigs (9.8 ± 1.2 kg body weight) were used to determine digestibility of crude protein and amino acids of MCSBM and FM. Experimental diets were formulated to contain either MCSBM or FM as the sole protein source and a nitrogen-free diet was included to estimate endogenous protein and amino acid losses. A latin square design and a randomized incomplete block design was used for the 30 and 10 kg pigs, respectively. A total of 336 pigs (184 barrows and 152 gilts) were weaned (21 ± 1 d of age) and randomly assigned to one of 6 experimental diets in a 3x2 factorial treatment design: Control (based on corn, soybean meal and whey), FM (FM added at the expense of soybean meal), and MCSBM (MSBM added at the expense of whey). Dietary acidifier was included in each Control, FM, and MCSBM at 0.2% to create the ControlA, FMA, and MCSBMA diets. Pigs were fed in a 3-phase feeding regimen where experimental diets were fed in Phase I (d0-7) and II (d8-21) and all pigs received a common Phase III nursery diet (d22-35). Pig gain and feed disappearance were measured weekly. At d7 and 21, stomach and jejunal tissue was collected from 1 pig/pen (n=8/treatment). Digesta pH was measured at 5 locations along the intestinal tract (stomach to colon) and ileal, cecal and fecal samples were flash frozen for microbial profile assessment. Standardized ileal digestibility (SID) of Ile, Leu, Lys, Met, and Thr was greater (P < 0.05) in FM than MCSBM but not different for all other amino acids. Mean initial body weight was 6.13 ± 0.83 kg and final body weight was 20.15 ± 2.01 kg. There was no difference between treatments in body weight, daily gain or gain:feed in Phase I, II, or III. Intestinal pH increased (P < 0.001) with progression down the gut and there was an interaction (P = 0.03) between dietary trt and location where pH did not increase from stomach to duodenum in pigs fed FMA and pH did not increase from duodenum to jejunum in pigs fed FM, MCSBM, and MCSBMA. There was a pattern of more acidic mucin in the stomach glands of pigs fed diets containing dietary acidifier. Based on digestibility and pig performance, MCSBM has potential as a high quality protein source in nursery pig diets.