

126 Effects of diet processing on growth performance of early-weaned pigs. J. T. Sawyer, J. C. Woodworth*, J. L. Nelssen, M. D. Tokach, R. D. Goodband, and S. S. Dritz, *Kansas State University*.

Early-weaned pigs (n=384; initially 5.5 kg and 14 d of age) were used to determine the effects of diet processing technique on growth performance. Pigs were blocked by initial weight and randomly allotted to one of four dietary treatments. Diets were manufactured and fed as unprocessed meal (M), universal pellet cooker-conditioned pellets (UPC), standard-conditioned pellets (P), or expanded, but not pelleted meal (EM). There were eight pigs per pen and initially eight (M and EM) or sixteen (UPC and P) pens per treatment. Diets were fed in three phases d 0 to 7, d 7 to 14, and d 14 to 28 with decreasing nutrient concentrations in each phase. Diets fed from d 0 to 7 (1.7% lysine) contained 25% whey, 6.7% spray-dried animal plasma (SDAP), and 1.75% spray-dried blood meal (SDBM). Diets fed from 7 to 14 (1.55% lysine) contained 20% whey, 2.5% SDAP, and 2.5% SDBM. On d 14, pigs fed UPC or P diets were used to further test the influence of processing technique on diet complexity. Pens of pigs fed UPC or P diets were randomly allotted to complex (CX; 10% whey, 2.5% SDBM, and 28% SBM) or least cost (LC; 0% whey and SDBM, and 38% SBM) formulations. Pigs fed M or EM diets were maintained on CX diets processed by the same method. From d 0 to 14, ADG and G/F were 250, 277, 281, and 259; and .86, .99, 1.03, and .94 for pigs fed M, UPC, P, and EM, respectively. Pigs fed P or UPC diets had improved ($P < .05$) ADG and G/F, with pigs fed M diets having the poorest ADG and G/F. From d 14 to 28, ADG and G/F were 503, 435, 485, 481, 544, and 472; and .63, .61, .66, .66, .75, and .68 for MCX, UPCCX, UPCLC, PCX, PLC, and EMCX, respectively. Pigs fed the PCX diet had numerically the highest ADG and best G/F compared to the other treatments; however, ADG and G/F were not different from MCX. Complex pelleted or UPC diets had numerically improved growth performance compared to LC diets. In summary, processing technique influences growth performance more in early nursery phases than in later, with pigs fed UPC or P diets having the best growth performance.

Key Words: Pigs, Growth, Diet processing

127 Floor-feeding enhances early appetite of weaned pigs. I. Mavromichalis* and D. H. Baker, *University of Illinois at Urbana-Champaign*.

Early-weaned pigs frequently experience starvation and (or) depressed appetite for the first few days after weaning. Poor growth during the first week postweaning results in increased days to market, and increased mortality and morbidity. To stimulate early feed consumption, pigs were offered a generous amount of a complex starter diet on a rubber floorboard (50 cm x 40 cm) with rims, placed in front of the five-hole self-feeder in each pen. In Exp. 1, 80 weaned pigs (5.6 kg) were randomly assigned (8 replicates/treatment and 5 pigs/pen) to receive a meal diet or nothing on the floorboard (at 0800, 1200, and 1600) for 7 d postweaning. All pigs had access to the same meal diet in self-feeders. Pigs with access to feed from floorboards grew 150% faster (175 vs 71 g/d; $P < .01$) than pigs with access only to feed from self-feeders. In Exp. 2, 45 weaned pigs (5.2 kg) were randomly assigned (3 replicates/treatment and 5 pigs/pen) to receive meal, pellets, or nothing on the floorboard (at 0800, 1200, and 1600) for 3 d postweaning. All pigs had access to the same diet in pellet form in self-feeders from d 0 to 7 postweaning. During the first 3 d, total feed intake (self-feeders and floorboards) was 364, 82, and 80 g/d and weight gain was 330, 91, and 31 g/d for pigs offered meal, pellets, and nothing on the floorboard, respectively. Surprisingly, pigs that were offered pellets on the floorboard did as poorly ($P < .05$) as pigs that were offered nothing on the floorboard, whereas pigs offered meal on the floorboard exhibited marked improvements in performance ($P < .01$). Overall (d 0 to 7 postweaning) feed intake was 194, 151, and 154 g/d whereas growth rate was 232, 169, and 133 g/d for pigs offered meal, pellets, and nothing on the floorboard, respectively. In conclusion, pigs with access to a complex starter diet in meal form and fed for only 3 d on floorboards had greater overall performance ($P < .01$) than pigs with access to pellets or nothing on the floorboard. Frequent floor-feeding with a diet in meal form stimulates nursery pigs to consume large quantities of solid feed after weaning.

Key Words: Nursery Pigs, Floor Feeding, Feed Management

128 Effects of feeder design (conventional dry, Crystal Spring dry and Crystal Spring wet/dry) on growth performance, water usage, and stomach morphology in finishing pigs. N. Amornthwaphat*, J. D. Hancock, K. C. Behnke, R. H. Hines, G. A. Kennedy, D. W. Dean, C. W. Starkey, D. J. Lee, C. L. Jones, and L. J. McKinney, *Kansas State University, Manhattan*.

A total of 180 crossbred pigs (average initial BW of 54 kg) were used to determine the effects of feeder design on growth performance, water usage, nutrient digestibility, carcass characteristics, and stomach morphology. There were 12 pigs (six barrows and six gilts) per pen and five pens per treatment. Treatments were a corn-soybean meal-based diet fed through: 1) a conventional two-hole dry feeder (Smidley®, Style B 1/2, No. 2); 2) a single-hole shelf feeder (Crystal Spring®, F-5000); and 3) the single-hole shelf feeder used as a wet-dry feeder (i.e., with a nipple water mounted in the trough). The diets were formulated to .95% and .80% lysine for 54 to 82 and 82 to 115 kg BW, respectively, and fed in a meal form. Pigs fed from the two-hole conventional and single-hole shelf feeders had similar growth performance and water usage. However, pigs fed from the wet-dry shelf feeders had 6.8% greater ADG ($P < .09$) and used 23% less water ($P < .05$) than those fed from the same feeder design used as a dry feeder. There were no differences for digestibilities of DM and N, carcass characteristics, and stomach ulcer (scored on a scale of 0 to 3) among pigs fed from the different feeder types ($P > .61$). We concluded that the wet-dry feeder design increased ADG and decreased water usage in finishing pigs.

	Conventional dry	Crystal Spring dry	Crystal Spring wet-dry	SE
ADG, g	941	929	992	66
Gain/feed, g/kg	361	346	353	5
Water, L/pig/d	5.1	5.4	4.4	.3
DM digestibility, %	89.9	89.6	90.2	.5
Fat thickness, mm	26.2	24.4	25.4	.8
Ulcer score	.50	.43	.48	.10
Keratinization score	.08	.04	.08	.05

Key Words: Wet/dry Feeder, Stomach Ulcers, Pig

129 Effects of feeder design and particle size of corn on growth performance, water usage, and stomach morphology in finishing pigs. N. Amornthwaphat*, J. D. Hancock, K. C. Behnke, R. H. Hines, G. A. Kennedy, D. W. Dean, D. J. Lee, J. S. Park, C. L. Jones, and L. J. McKinney, *Kansas State University, Manhattan*.

A total of 192 crossbred pigs (average initial BW of 52 kg) were used to determine the effects of feeder design and particle size of corn on growth performance, water usage, carcass characteristics, and stomach morphology. There were 12 pigs per pen and four pens (two pens barrows and two pens gilts) per treatment. Treatments were diets with coarse (1,000 to 1,100 microns) and fine (500 to 600 microns) corn fed through a conventional two-hole dry feeder (Smidley®, Style B 1/2, No. 2) and a single-hole wet-dry shelf feeder (Crystal Spring®, F-5000). The diets were formulated to .95% and .80% lysine for 52 to 92 and 92 to 111 kg BW, respectively, and fed in a meal form. Pigs fed from wet-dry feeders had 5.4% greater gain/feed ($P < .007$) than pigs fed from conventional feeders. Also, pigs fed diets with finely ground corn had 3.1% greater gain/feed ($P < .07$) regardless of feeder design (i.e., no feeder design x particle size interactions, $P > .96$). Dramatic decreases (58%) in water usage were observed in pig fed from wet-dry feeders ($P < .001$). Particle size of corn did not affect water usage in pigs fed from the wet-dry feeders, but in the conventional dry feeder, there was decreased water usage when corn particle size was decreased (feeder design x particle size interaction, $P < .09$). There were no differences for carcass characteristics among pigs fed from the different feeder designs or the different corn particle sizes ($P > .98$). However, keratinization of the stomach (scoring scale of 0 = normal to 3 = severe) increased with reduced particle size ($P < .001$) regardless of feeder design. In conclusion, pigs fed from wet-dry feeders had greater gain/feed and used less water than pigs fed from conventional dry feeders. Furthermore, gain/feed was increased with finely ground corn regardless of feeder design.