

**Title:** Evaluating the use of long-term conditioning or extrusion to extract nutrients from low energy feedstuffs – **NPB #14-057** revised

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**Scientific abstract:** A total of 270 pigs (PIC 337 × 1050; initially 52.2 kg BW) were utilized in a 79-d experiment to determine the effects of long-term conditioning or extrusion on finishing pig nutrient digestibility, growth performance and carcass characteristics. There were 7 or 8 pigs per pen and 9 pens per treatment. Treatments included 1) negative control: non-processed mash, 2) positive control: pelleted with 45 s conditioner retention time, 3) pelleted with 90 s conditioner retention time, and 4) extruded. Diets were fed in 3 phases with the same low energy diet formulation fed across treatments, containing 30% corn dried distillers grains with solubles and 19% wheat middlings. Thermal processing, regardless of type, improved ADG and G:F ( $P < 0.05$ ), but did not affect ADFI ( $P > 0.10$ ). Extruded diets tended to improve G:F compared to pelleted diets ( $P < 0.10$ ). Interestingly, HCW was greater when pigs were fed pelleted diets compared to extruded diets, regardless of conditioning time ( $P < 0.05$ ). However, pigs fed any thermally-processed treatment had greater HCW compared to those fed the negative control mash ( $P < 0.05$ ). Thermal processing did not influence percentage yield, backfat, or loin depth when HCW was used as a covariate ( $P > 0.10$ ). However, pigs fed thermally-processed diets had greater jowl iodine value compared to those fed mash diets ( $P < 0.05$ ). This experiment again confirms the benefits of thermally processing feeds to improve ADG and G:F, but neither extended conditioning nor extrusion extracted additional nutrients from low energy feedstuffs compared to traditional pelleting. However, this research suggests that more extreme thermal processing conditions may be used without hindering nutrient utilization.

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