

**47 Quantitative evaluation of hunger in pregnant sows: metabolic and hormonal responses to feeding frequency under limit-fed regime.** Hayford Manu<sup>1</sup>,

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The objectives of the study were to determine the pattern of glucose, insulin, active ghrelin, and total PYY responses and indirectly quantify perceived hunger in pregnant sows under-limit fed conditions. Eighteen sows [(Landrace × Yorkshire); BW 211.86 ± 1.29 kg; parity 3.80 ± 0.16; backfat 13.50 ± 0.25 mm] were sampled from 180 sows. Sows were blocked by parity and BW and randomly assigned to 1 of 3 treatments in a RCBD. Treatments included sows fed once at [0730 h (Control, T1), twice [half ration at 0730 and 1530 h (T2)], or thrice [one-third portion at 0730, 1130, and 1530 h (T3)]. The daily feed quantity was kept at 1.25× maintenance energy intake ( $100 \times (\text{BW})^{0.75}$ ) kcal ME/d. Sows received corn-soybean meal-based diet which provided 6935 kcal ME/d and SID Lys:ME of 1.71 g/Mcal from d 30 to 60 of gestation. Hunger was quantified using total area under the curve (AUC) of the hormonal responses. Data analysis was done using PROC MIXED and GLIMMIX procedure of SAS. Sow was the experimental unit. Adjustment for multiple comparisons was by Tukey's method. The control sows had greater 23-h mean glucose concentration than sows fed 3× daily (P = 0.002). Active ghrelin concentration for sows fed 3× daily tended to be lower (P = 0.063) compared with control sows but reduced (P = 0.018) relative to sows fed 2× daily. In conclusion, sows fed 3× daily had 9.0% reduction in 23-h glucose total AUC, 42.5% greater 23-h insulin total AUC, 27.4% reduction in active ghrelin total AUC, and 14.2% greater PYY total AUC compared with pregnant sows fed 1× daily. It is suggested that hunger in pregnant sows occurs at active ghrelin/total PYY ratio of  $5.06 \pm 0.20$  and at a mean plasma glucose concentration of  $70.37 \pm 1.39$  mg/dL and below.

**Keywords:** active ghrelin, feeding frequency, pregnant sows

**50 Pelleting and Starch Characteristics of Diets Containing Enogen® Feed Corn.**

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This experiment determined the effects of die thickness and conditioning temperature on pelleting and starch characteristics in diets containing conventional or Enogen® feed corn (Syngenta Seeds, LLC). Treatments were arranged as a 2 × 2 × 3 factorial of corn type (conventional [CON] and Enogen® feed corn [EFC]), die thickness (5.6 and 8.0 length:diameter [L:D]), and conditioning temperature (74, 79, and 85°C). Diets were steam conditioned and pelleted (CPM Model 1012-2) with a 4 × 22.2 mm or 4 × 31.8 mm pellet die. Conditioner retention time was set at 30 s and production rate was set at 15 kg/min. All treatments were replicated on 3 separate days. Data were analyzed using the GLIMMIX procedure in SAS (v. 9.4, SAS Institute Inc., Cary, NC). Increasing die L:D improved PDI (P=0.01) and increased (P=0.02) energy consumption. Increasing conditioning temperature from 74 to 85°C increased (linear, P< 0.03) PDI (84.2, 84.9, and 88.2%, respectively) and tended to decrease energy consumption (quadratic, P=0.07). There was a corn × conditioning temperature interaction (P=0.01) for gelatinized starch in conditioned mash. Enogen® feed corn diets steam conditioned at 85°C had the greatest quantity of gelatinized starch. Cooked starch of conditioned mash was greater (P< 0.01) for EFC diets compared to CON diets and increased (linear, P< 0.01) with increasing conditioning temperature. Starch gelatinization was greater (P< 0.01) in pelleted EFC diets (13.4%) compared to CON diets (11.7%) and was increased (linear, P=0.05) by increasing conditioning temperature from 74 to 85°C (12.0, 12.1, and 13.4%, respectively). Pelleted diets containing EFC had increased (P< 0.01) cooked starch compared to CON diets. In conclusion, increasing die L:D and increasing conditioning temperature improved PDI. Starch gelatinization was increased when diets were pelleted at the highest conditioning temperature of 85°C, and EFC diets resulted in greater gelatinized starch.

**Keywords:** Enogen feed corn, pelleting, starch