## 81 Increasing withdrawal duration of corn distillers dried grains with solubles on finishing pig performance and carcass characteristics.

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A total of 860 finishing pigs (PIC C48/L42×327; initially 66.2 kg BW) were used in a 76-d experiment to evaluate the effects of removing corn DDGS from diets at increasing intervals before harvest. Diets contained 40% DDGS prior to the experiment, 0 or 35% DDGS during the experiment from approximately 66 to 82 kg and 0 or 30% DDGS until the completion of the trial. Pen served as the experimental unit, and there were 7 replicate pens/treatment with 23 to 25 pigs/pen. Pens were blocked by BW and allotted to 1 of 5 dietary treatments, differentiated by the number of days prior to slaughter that diets containing DDGS were withdrawn and replaced with corn-soybean meal-based diets. Withdrawal times were 76, 42, 27, 15, or 0 d (no withdrawal) before harvest. Linear and quadratic response to withdrawal time was evaluated using PROC GLIMMIX. For the overall period (d -76 to 0), as time of DDGS withdrawal increased, ADG and final BW also increased (linear, $P < 0.018$) and G:F improved (quadratic, $P = 0.019$). Average daily feed intake quadratically decreased ($P = 0.030$) with increasing withdrawal time. There was a linear increase ($P = 0.010$) in HCW, with a marginally significant increase in carcass yield (linear, $P = 0.094$) with increasing DDGS withdrawal time. Loin depth and lean percentage did not demonstrate any evidence for treatment differences ($P > 0.132$). Backfat was linearly increased ($P = 0.030$) with increasing DDGS withdrawal time. Lastly, iodine value (IV) of belly fat was increased (linear, $P = 0.001$) with increased feeding duration of DDGS. In conclusion, removing pigs from diets containing DDGS for longer periods before slaughter increased ADG and improved G:F, resulting in increased HCW. Belly fat IV was decreased as the length of DDGS withdrawal increased, with the highest IV resulting from pigs that consumed DDGS for the entire experimental period.

Table 1. Increasing withdrawal duration of corn distillers dried grains with solubles on finishing pig performance and carcass characteristics

| | DDGS diet withdrawal before market, d | | | | | | Probability, *P*= | |
|---|---|---|---|---|---|---|---|---|
| Item | 76 | 42 | 27 | 15 | 0 | SEM | Linear | Quadratic |
| d -76 to 0 | | | | | | | | |
| ADG, kg | 0.92 | 0.88 | 0.89 | 0.88 | 0.86 | 0.012 | 0.002 | 0.973 |
| ADFI, kg | 2.78 | 2.80 | 2.85 | 2.77 | 2.73 | 0.071 | 0.251 | 0.030 |
| G:F | 0.330 | 0.315 | 0.315 | 0.320 | 0.316 | 0.0063 | 0.003 | 0.019 |
| Final BW, kg | 133.8 | 131.7 | 132.0 | 130.6 | 128.6 | 2.22 | 0.018 | 0.573 |
| HCW, kg | 99.1 | 97.7 | 97.2 | 96.1 | 94.8 | 1.82 | 0.010 | 0.554 |
| Yield, % | 73.6 | 73.6 | 73.3 | 73.0 | 73.0 | 4.13 | 0.094 | 0.615 |
| Loin depth, mm | 71.8 | 72.0 | 71.8 | 72.4 | 72.7 | 0.71 | 0.335 | 0.532 |
| Backfat, mm | 13.1 | 12.7 | 13.2 | 12.7 | 12.1 | 0.68 | 0.030 | 0.084 |
| Lean, % | 57.1 | 57.2 | 57.1 | 57.3 | 57.4 | 0.20 | 0.132 | 0.232 |
| Iodine value | 66.8 | 68.2 | 69.9 | 69.5 | 74.0 | 0.99 | 0.001 | 0.062 |

**Key words:** DDGS withdrawal, finishing pig, growth

## 84 Improving dietary amino acid balance reduces heat production in lactating sows exposed to heat stress.

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We hypothesized that lactating sows fed a reduced CP (RCP) diet with supplemental AA to improve AA balance produce less metabolic heat (HP) compared with feeding a conventional diet (control). The objective was to measure HP of sows (n = 24) fed control (19.6% CP) or RCP (14.2% CP) under thermoneutral (TN, 21 ± 1.5°C) or cycling heat stress (HS, 32 ± 1.5°C daytime and 24 ± 1.5°C nighttime). Diets contained 0.90% SID Lys and 2,580 kcal/kg. Positive pressure indirect calorimeters were used to measure gas exchange in individual sows with litters (sow + litter), and individual piglets on lactation d 4, 8, 14 and 18, and HP determined overnight (1900–0700) and during daytime (0700–1900). Sow and litter weights were recorded on d 1, 10 and 21. Sow HP was calculated by subtracting litter HP from sow + litter HP based on $BW^{0.75}$. Model included the fixed effect of diet, random effects of block and sow, sow feed intake as a regression variable and day as the repeated measurement. Compared to control, HP (kcal/h·$kg^{0.75}$) of RCP was lower ($P < 0.01$) overnight (5.25 vs. 5.96 ± 0.38), during daytime (6.33 vs. 6.94 ± 0.23), and over 24-h (5.78 vs. 6.46 ± 0.24) under HS. Under TN, HP of RCP tended to differ ($P = 0.107$) overnight (5.20 vs. 5.90 ±0.57) and over 24-h (5.93 vs. 6.48 ± 0.50) and did not differ ($P = 0.190$) during daytime (6.66 vs. 7.06 ± 0.52). Under HS, lactation day affected HP ($P < 0.05$) overnight and over 24-h, with HP increasing from d 1 to 14 and decreasing from d 14 to 18. Under TN, day of lactation did not affect sow HP. Feeding RCP diet to lactating sows decreased HP, and this effect was more pronounced in sows housed under HS.

**Key words:** heat stress, heat production, lactating sow