

efficiency. Our objective was to determine how mode of delivery and rearing affected VFA production in young calves. Bred mature Charolais cows were randomly allocated to one of three treatment groups: control (CON; $n = 8$), bottle reared (BOT; $n = 8$), and caesarian section (CSECT; $n = 8$), where CON was vaginal birth and raised by their dam; BOT was vaginal birth, then removed 24 h post-parturition, and raised on commercial milk replacer; and CSECT was born via caesarian section and raised by their respective dams. Calf rumen fluid was collected via oral lavage and flash frozen on d 1, 3 and 28 of age. Samples were analyzed by GLC to determine VFA concentrations. The MIXED procedure of SAS was used to determine the effects of day, treatment group, and the interaction on acetate:propionate, total VFA concentration, and individual VFA concentrations (mM). Means were separated using LSD and differences were considered significant when $P \leq 0.05$ and tendency when $0.05 < P \leq 0.10$. Results showed a main effect of day ($P < 0.05$) for total VFA, acetate:propionate, acetate, propionate, and butyrate concentrations. Total VFA ($P < 0.05$) increased with day of age. Acetate concentrations were not different ($P \geq 0.05$) on d 1 and 3, but were less ($P < 0.05$) on d 28. Alternatively, butyrate concentrations were less ($P < 0.05$) on d 28 compared to d 1 and 3, which were similar ($P = 0.86$). Propionate was intermediate ($P < 0.05$) on d 28 to d 1 and 3. Acetate:propionate was not different ($P = 0.24$) between d 1 and 28, but was less ($P < 0.05$) on d 3. There were day by treatment interactions for isobutyrate and valerate ($P \leq 0.03$) and a tendency for isovalerate ($P = 0.08$) where concentrations increased with day and greatest ($P < 0.05$) concentrations reported within the BOT and CSECT treatments on d 28. We conclude that both age and maternal influences may alter VFA production in calves, which may have implications for production efficiency later in life.

Key Words: Rumen, VFA, Maternal effects

510 The Effects of Moisture Addition and Dwell Time of Moisture on Pellet Quality in Corn and Wheat Based Diets. H. K. Wecker*, A. D. Yoder, C. K. Jones, J. C. Woodworth, C. R. Stark, C. B. Paulk, *Kansas State University, Manhattan, KS*

This experiment was conducted to determine the effects of water addition in the mixer on pellet quality of diets with increasing levels of wheat. Treatments were a 3×3 factorial with water addition (none, 20g water/kg feed with a 30 minute dwell time, and 20 g water/kg feed with a 240 minute dwell time before pelleting) and 3 diets (corn-soybean meal based control diet, control

diet with 10% or 20% wheat). Dietary treatments were mixed in 90.7 kg batches using a stainless steel mixer (Davis Model 014197 SS-S1). Diets were then pelleted using a pilot-scale single pass conditioner and pellet mill (CPM Model CL5) equipped with a 3.96mm \times 22.2mm die. Diets were pelleted at a targeted temperature of 85°C. Temperatures, amperage, and production rate were recorded. Each treatment was replicated 3 times. Cooled pellet samples were collected for determination of pellet durability index (PDI). There were no wheat \times added moisture interactions ($P > 0.05$) for temperature, DM, amps, production rate, or PDI. Increasing levels of wheat caused no change ($P > 0.05$) in processing temperature during pelleting. No DM differences were found between treatments ($P > 0.05$) in initial mash, conditioned mash, hot pellets and cooled pellets with increasing levels of wheat. Increasing levels of wheat did not affect ($P > 0.05$) pellet mill amp usage or production rate. Conditioner and hot pellet temperature decreased ($P < 0.05$) when 2% water was added to the mixer compared to the control. Water addition for 30 min decreased ($P < 0.05$) cooled pellet temperature compared to the control while 240 min water addition had intermediate temperatures. Water addition decreased ($P < 0.05$) DM in the initial mash, hot pellet, and cooled pellet samples. Increasing wheat by up to 20% increased (linear, $P < 0.05$) PDI, while 2% moisture added to the mixer decreased ($P < 0.05$) PDI. Diets with 2% added moisture in the mixer had decreased ($P < 0.05$) conditioning temperatures. This was likely because the diets reached maximum moisture levels prior to reaching the target conditioning temperature and the pellet mill experienced roll slip. In conclusion, achieving a higher moisture content during pelleting at a lower conditioning temperature with the pellet mill parameters used within this study did not improve pellet quality. However, increasing the level of wheat inclusion in the diet improved pellet quality.

Key Words: Moisture, Pellet Quality, Wheat

511 Temporal Expression Patterns of Twelve Genes during Fetal and Postnatal Skeletal Muscle Development in Pigs. B. A. Wolfer*, K. R. Daza, D. Velez-Irizarry, N. E. Raney, V. D. Rilington, C. W. Ernst, *Department of Animal Science, Michigan State University, East Lansing, MI*

Characterizing the temporal expression patterns of genes throughout fetal myogenesis and postnatal skeletal muscle hypertrophy in pigs is critical to obtain a better understanding of the genes involved in these important processes. Previous transcriptome-wide