affect expression of various milk OBCFA; these effects would need to be considered in the development of models aiming to predict rumen parameters based on milk OBCFA.

Table 1 (Abstr. 378). Milk fat concentrations (mg/g) of individual OBCFA

	5-15 DIM	60-70 DIM	120-130 DIM	210-220 DIM	300-310 DIM	*P*-value
Fatty acid						
11:0	0.20	0.46	0.49	0.86	0.69	<0.01
13:0	0.41	0.93	0.99	1.38	1.20	<0.01
15:0	5.47	9.86	11.17	12.50	12.32	<0.01
17:0	3.79	2.41	2.31	2.07	2.22	<0.01
c9 17:1	1.85	0.85	0.76	0.77	0.79	<0.01
Odd	12.04	14.77	16.05	17.90	17.52	<0.01
ai 13:0	0.15	0.21	0.22	0.16	0.24	0.60
ai 15:0	2.20	4.74	5.22	4.88	4.85	<0.01
ai 17:0	4.26	3.99	4.10	3.60	3.67	<0.01
Anteiso	6.60	8.94	9.54	8.65	8.79	<0.01
i 14:0	0.62	1.54	1.82	1.45	1.66	<0.01
i 16:0	2.06	3.42	3.92	2.98	3.28	<0.01
i 18:0	3.29	5.25	5.99	4.64	5.17	<0.01
Even iso	3.29	5.25	5.99	4.64	5.17	<0.01
i 13:0	0.24	0.33	0.39	0.34	0.35	<0.01
i 15:0	5.01	10.03	12.12	10.60	10.76	<0.01
i 17:0	3.32	2.88	3.03	2.74	2.70	<0.01
Odd iso	8.57	13.24	15.54	13.68	13.80	<0.01

Key Words: milk fat synthesis, odd- and branched-chain fatty acids, stage of lactation

M379 Ruminal and production effects of supplementing high and low forage dairy rations with a live yeast culture. Maegan E. Weatherly*[1], Amanda M. Gehman[2], Amanda M. Lisembee[2], Joey D. Clark[1], Laurel L. Ball[2], and Jeffrey M. Bewley[1], *[1]University of Kentucky, Lexington, KY, [2]Alltech Inc., Nicholasville, KY.*

The objective of this study was to assess the effect of yeast supplementation in high and low forage diets on rumen and production parameters. Four, ruminally fistulated, multiparous, mid-lactation, Holstein cows were housed in a tie-stall barn at the University of Kentucky Coldstream Dairy from October 29, 2013 to February 7, 2014. A 4 × 4 Latin square design with a 2 × 2 factorial arrangement of treatments was used. Cows were assigned to 1 of 4 treatments each period including (1) low forage (LF), (2) low forage with 10 g/d yeast (Yea-Sacc; Alltech Inc., Nicholasville, KY; LFY), (3) high forage (HF), or (4) high forage with 10 g/d yeast (HFY). Periods 1 to 3 consisted of 21 d and period 4 was 18 d. Treatment periods were followed by a 7-d washout period where cows were gradually adjusted to the next ration. Dry matter intake was recorded daily. Daily rumination was recorded using HR Tags (SCR Engineers Ltd., Netanya, Israel). Rumen papillae were biopsied from each cow once per feeding period and analyzed for expression of enzymatic genes and transcriptional regulators. The GLM procedure of SAS (Version 9.3 SAS Institute, Inc., Cary, NC) was used to evaluate the fixed effects of cow, period, forage, yeast, and the interaction of forage and yeast on each parameter. Rumen papillae gene expression data were analyzed using a MIXED model in SAS. Rumination time and DMI were the only production parameters significantly influenced by treatment ($P < 0.01$). Dry matter intake was 17.05, 13.41, 19.44, and 20.29 ± 1.40 kg/d for cows on the LF, LFY, HF, and HFY treatments, respectively. Rumination time was 442.88, 323.09, 433.34, and 475.50 ± 21.93 min/d for cows on the LF, LFY, HF, and HFY treatments, respectively. Expression of peroxisome proliferator-activated receptor γ, sterol regulatory element-binding transcription factor 1, and oxoglutarate dehydrogenate ornithine carbamoyl transferase were significantly upregulated by yeast supplementation ($P \leq 0.05$). The upregulation of genes that affect metabolism of VFA during yeast supplementation may suggest the importance of this product on rumen stabilization.

Key Words: yeast, rumen papillae gene expression, rumination

M380 Effects of milk replacer and multivitamin-mineral supplementation on metabolism and rumen development in heat-stressed dairy calves. Steven J. Blair*[1], Cathleen C. Williams[1], Bruce F. Jenny[1], Ashley H. Dolejsiova[1], and Thomas J. Earleywine[2], *[1]Louisiana State University, Baton Rouge, LA, [2]Land O'Lakes Animal Milk Products, Shoreview, MN.*

Seventy-one neonatal Holstein calves (40 female; 31 male) were used in a randomized block design with a 2 × 2 factorial arrangement of treatments to evaluate the effects of milk replacer (MR) feeding management alone or in combination with a multivitamin and electrolyte supplement on growth performance and mitigation of heat stress in southeast Louisiana. Milk replacer treatments consisted of Land O'Lakes Herdmaker Supreme (20% CP, 20% fat; CON) and Land O'Lakes Warm Front (27% CP, 10% fat; WF). Supplemented calves received either 0 or 20 mL of Palamountains Calf Boost (CB) in MR once daily. Calves were offered MR treatments and water and calf starter (20% CP) ad libitum beginning on d 2. All milk replacer was mixed at 15% solids. Calves consuming CON were fed 2.28kg MR twice daily. Calves on WF were fed 2.72kg MR twice daily for the first 3 weeks of life, and 3.86kg twice daily until weaning. Beginning on d 42, MR feeding was reduced to 1 time per day for all treatment groups to decrease MR intake by 50%. On d 49 calves were weaned. Calves remained in their hutches until d 56 to determine immediate post weaning performance. Blood was collected on d 14, 28, 42, and 56 for analysis of plasma urea nitrogen (PUN), glucose, and β-hydroxybutyrate (BHBA), as well as rumen fluid for analysis of volatile fatty acids (VFA) and pH. Data were analyzed using the PROC MIXED procedure in SAS. A main effect of milk replacer composition on PUN was observed, with calves fed WF having greater concentrations ($P < 0.05$) than CON. Glucose concentrations decreased ($P < 0.05$) as calves aged. There was no treatment effect ($P > 0.05$) on plasma BHBA, but concentrations increased ($P < 0.05$) as calves aged. Likewise, there was no treatment effect ($P > 0.1$) on rumen acetate, propionate, butyrate, and total VFA concentrations; however, concentrations increased ($P < 0.05$) as calves aged. No effects of treatment or time were observed ($P > 0.05$) for rumen pH. These data indicate that milk replacer composition and feeding management and multivitamin mineral supplements do not affect negatively metabolism or rumen development in young dairy calves.

Key Words: calf milk replacer, multivitamin-mineral supplement, heat stress

M381 Validation of a radio frequency system for monitoring feeding behavior and intake of feed and water in young cattle. Baltazar Ruas de Oliveira Júnior[1], Marcelo Neves Ribas[2], Fernanda Samarini Machado[3], Juliana Aparecida Mello Lima[1], Luigi Francis Lima Cavalcanti[2], Mario Luiz Chizzotti[4], Rafael Alves de Azevedo*[1], and Sandra Gesteira Coelho[1], *[1]Federal University of Minas Gerais, Belo Horizonte, MG, Brazil, [2]CNPq, RHAE–SEVA Engenharia, Projeto Intergado, Contagem, MG, Brazil, [3]EMBRAPA Dairy Cattle,*

Juiz de Fora, MG, Brazil, [4]Federal University of Viçosa, Viçosa, MG, Brazil.

The objective was to validate a radio frequency system for monitoring individual feeding behavior, water and feed consumption in young cattle housed in group. Thirty 5 Holstein-Gyr crossbred heifers, fitted with an ear tag containing a unique passive transponder, were distributed in 3 groups of 12, 12 and 11 animals per period and had free access to 12 electronic feed bins and 2 electronic water bins (Intergado, Contagem, Brazil). The system documented the visit duration and feed and water intake by recording animal's identification tag, bin number, initial and final times of visits, and the difference of feed/water weight at start and end for each bin visit. Feed bins were monitored by time-lapse video recording over 4 d and the water bins over 6 d. Video data on animal behavior were compared with those generated by the system. Feed and water consumption were measured using an external scale. For each feed bin, 2 feeding events were monitored using manual weighing's immediately before and after the animal's visit and the difference between them was assumed as feed intake (n = 24 observations). For water bins there were made 60 manual weighing's. These data were compared with those recorded by the system. Video and manual weighing data were regressed on the electronic feeding behavior and feed and water intakes data to evaluate system's precision and accuracy. The system showed a high specificity (98.98 and 98.56% for the feed and water bins, respectively) and sensitivity (99.25 and 98.74%, respectively) for identifying animal's presence or absence. Duration of feed and water bins visits, and feed and water consumption per visit estimated by the system were highly correlated and precise (R^2 = 0.917, 0.963, 0.973 and 0.986, respectively) when compared with observed video and manual weighing data. Feed daily intake per visit registered electronically and manual weighing differed by less than 150 g. It was concluded that Intergado system is a useful tool for monitoring feeding behavior, water and feed intakes in young cattle housed in group.

Key Words: electronic monitoring, heifer, precision farming

M382 Evaluation of two techniques used to dislodge bacteria from particles contained in rumen digesta. Jared V. Judy*, Chad J. R. Jenkins, Samodha C. Fernando, and Paul J. Kononoff, *University of Nebraska-Lincoln, Lincoln, NE.*

The objective of this study was to estimate the concentration of bacterial crude protein (BCP) in pellets isolated from ruminal digesta using a preparatory step of either blending or shaking to dislodge bacteria from rumen particles. Using a completely randomized design, 2 multiparous, lactating Holstein cows (DIM 229 ± 7d, DMI 36.1 ± 2.5 kg/d, milk yield 37.7 ± 5.6 kg/d) (mean ± SD), fitted with ruminal cannulas were fed the same diet once daily at 0930 h. Two hours post feeding, approximately 2.5 kg of rumen contents were collected from each cow, then thoroughly mixed and separated into 2 aliquots (blend or shake) then samples were strained through 4 layers of cheesecloth. Particle associated bacteria were separated from the solid portion of rumen contents by adding and equal amount of McDougal's buffer as was collected in the filtrate and physically shook or blended in a commercial blender for 1 min., followed by straining through 4 layers of cheesecloth. Fluid collected after shaking or blending, as well as fluid retained from the initial straining where combined together. Each sample underwent differential centrifugation which yielded bacterial pellets consisting of fluid associated bacteria and particle associated bacteria. DNA was then extracted from bacterial pellets and from the non-centrifuged samples of rumen content particles. The DNA from the bacterial pellets and samples of rumen content were subjected to real-time PCR using the TaqMan assay. Primers and a probe were designed from the DNA encoding part of the 16S rRNA for bacteria. The concentration of BCP using these 2 methods to dislodge bacteria did not differ (P = 0.42) (13.9 ± 5.0 and 7.5 ± 1.9 mg BCP/g DM for shake vs. blend, respectively). Results suggest that BCP concentration is not different between shaking or blending to dislodge bacteria, however, further research should examine and attempt to identify the large amount of analytical variation observed in both techniques.

Key Words: bacteria, bacterial crude protein, rumen

M383 Effect of an exogenous fibrolytic enzyme on the performance of dairy cows consuming a diet with a high proportion of bermudagrass silage. Andres A. Pech Cervantes*, Kathy G. Arriola, Jorge E. Zuniga, Ibukun M. Ogunade, Yun Jiang, Thiago F. Bernardes, Charles R. Staples, and Adegbola T. Adesogan, *Department of Animal Sciences, University of Florida, Gainesville, FL.*

We previously reported that milk production by dairy cows was increased by adding specific xylanase-rich (XYL) and xylanase-cellulase enzymes to corn silage-based diets containing 0 or 10% bermudagrass silage. This study examined effects of adding XYL on the intake and performance of lactating dairy cows consuming a TMR formulated with a greater proportion of bermudagrass silage. Endoglucanase and xylanase activities of XYL were 3,283 and 46,281 μmol/min/mL, respectively. Forty lactating Holstein cows (16 multiparous and 24 primiparous; 21 ± 3 DIM; BW 589 ± 73 kg) were stratified by milk production and parity and assigned randomly to Control and XYL diets. The TMR (CP of 16.2% of DM, NDF of 36.4% of DM, and NE_L of 1.65 Mcal/kg of DM) contained 20% bermudagrass silage, 25% corn silage, and 55% concentrate (DM basis). Immediately before the a.m. (0700 h) and p.m. (1300 h) feedings, the enzyme was sprayed on the XYL diet at the rate of 1 mL/kg of TMR DM in a Calan data ranger and mixed. A second data ranger was used to feed control cows. Cows were fed experimental diets for 70 d after they were fed a common diet for a 9-d covariate period. The experiment had a randomized complete block design. The statistical model included effects of enzyme, parity, week, and their interactions as well as covariate milk production or DMI. The random effect was cow nested within treatment. Application of XYL did not (P > 0.10) affect milk yield (35.1 vs. 36.2 kg/d), DM intake (24.0 vs 23.7 kg/d for XYL and Control), fat-corrected milk (FCM) (36.1 vs. 36.9 kg/d), yields of milk fat (1.29 vs. 1.31 kg/d) and protein (1.07 vs. 1.08 kg/d), milk fat concentration (3.65 vs. 3.61%), and body weight change (0.26 vs. 0.33 kg/d) compared with control cows. However, cows fed the diet treated with XYL had greater milk protein concentration (P = 0.01; 3.02 vs. 2.95%) and tended to have less feed efficiency (P = 0.06; 1.52 vs. 1.57 kg of FCM/kg of DMI) compared with cows fed the control diet. Adding XYL to a diet containing 20% bermudagrass silage and 25% corn silage did not improve DM intake or milk production.

Key Words: bermudagrass silage, milk, enzyme

M384 Effects of intensive whole-milk feeding in calves on subsequent feeding behavior of dairy heifers. Camila Flávia de Assis Lage[1], Mariana Magalhães Campos[2], Fernanda Samarini Machado[2], Paulo Campos Martins[1], Luigi Francis Lima Cavalcanti[3], Marcelo Neves Ribas[3], Luiz Gustavo Ribeiro Pereira[2], Thierry Ribeiro Tomich[2], Rafael Alves de Azevedo*[1], and Sandra Gesteira Coelho[1], *[1]Federal University of Minas Gerais, Belo Horizonte, MG, Brazil, [2]EMBRAPA Dairy Cattle, Coronel Pacheco, Minas GG, Brazil, [3]CNPq, RHAE–SEVA Engenharia, Projeto Intergado, Contagem, MG, Brazil.*

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