603 The effects of Megalac and a fatty acid prill containing high levels of palmitic acid supplementation on milk fatty acid composition with early lactation dairy cows. Guiling Ma[1], Elliot Block[2], Limin Kung[3], Joe Harrison*[1], and C. Merrill[2], *[1]Washington State University, Puyallup, WA, [2]Arm & Hammer Animal Nutrition, Princeton, NJ, [3]University of Delaware, Newark, DE.*

The objective of this study was to compare 2 fat sources, Megalac (Church & Dwight Co. Inc., Princeton, NJ;) and a high palmitic acid prill (Guarantee-palmitate (min) 80%) on composition of milk fatty acids of early lactation cows in a feeding trial lasting 12 wks. Thirty multiparous Holstein cows were randomly assigned to 1 of 2 diets. Except for the fat products, other feeding ingredients were identical in the diets. Fat products were supplemented at 1.2% (DMI). Milk components were assessed from AM and PM milkings. Milk fatty acids were analyzed with Proc Mixed. The interaction between time and treatment was also analyzed. There were no differences in the composition of short chain fatty acids (C6:0, 8:0, 10:0, 11:0, 12:0, 14:1T, 14:1, 15:0 and 15:1T) between treatments ($P > 0.05$). Palmitic supplementation increased palmitic acid in milk (37.2 ± 0.5 vs. 40.7 ± 0.6, $P < 0.05$), while there was a fat source x week interaction ($P < 0.05$). Megalac supplementation increased the concentration of stearic acid (10.1 ± 0.3 vs. 8.8 ± 0.3, $P < 0.05$), and no interaction between fat source and time ($P > 0.05$). MEGALAC™ supplementation also increased ($P < 0.05$) unsaturated fatty acids C18:1–8T (0.081 ± 0.004 vs. 0.067 ± 0.004), C18:1–9T (0.31 ± 0.03 vs. 0.21 ± 0.03), C18:2 (2.5 ± 0.1 vs.2.2 ± 0.1), C20:1–8-eicosenoate (0.054 ± 0.003 vs. 0.042 ± 0.004), and there was no time interaction ($P > 0.05$). Megalac supplementation increased ($P < 0.05$) C18:1–11T (1.13 ± 0.08 vs.0.89 ± 0.08, $P < 0.05$), tended to increase C18:1–12C (0.34 ± 0.01 vs. 0.31 ± 0.01, $P < 0.07$), increased C18:2-*cis*-9,*trans*-11 (0.45 ± 0.02 vs. 0.38 ± 0.03, $P < 0.06$), and there was a time interaction. There was no difference ($P > 0.05$) between fat sources for C16:1T, C16:1, C17:0, C17:1–10-heptadecenoate, C18:1–10-T, C18:1, C18:1–11-C, C18:3-γ, C18:3-α, C18:2CLA, and C18:2- *trans*-10,*cis*-12, in milk. Except for C18:1–12C, there was no difference between AM and PM sampling times ($P > 0.05$). Our findings suggest that in the future, it is not necessary to separately analyze the AM, PM samples for milk fatty acid analysis. Feeding of Megalac appears to promote the T 11 vs. T 10 pathway of biohydrogenation.

Key Words: milk, fatty acid, dairy

604 Effects of different levels of supplementation of a molasses and crude glycerol mixture on ruminal fermentation parameters of beef steers. Francine M. Ciriaco*, Darren D. Henry, Vitor R. G. Mercadante, Tessa M. Schulmeister, Martin Ruiz-Moreno, G. Cliff Lamb, and Nicolas DiLorenzo, *North Florida Research and Education Center, University of Florida, Marianna, FL.*

We determined the effects of feeding different levels of a 50:50 molasses:crude glycerol supplement on ruminal fermentation and blood parameters. Eight ruminally cannulated Angus crossbred steers (323 ± 42 kg BW) were used in a 4 × 4 duplicated Latin square design. In each of the 4 28-d periods, animals were housed in individual pens at the University of Florida Feed Efficiency Facility, had ad libitum access to Tifton 85 bermudagrass hay, and were randomly assigned to one of 4 treatments: 0, 0.45, 1.36, and 2.27 kg/d (as fed) of a 50:50 liquid mixture of molasses:crude glycerol. Ruminal fluid and blood samples were collected before supplement feeding (0 h) and every 3 h postfeeding for 24 h. Immediately after each collection, ruminal pH was measured. Plasma was analyzed for blood urea nitrogen (BUN) and ruminal fluid for VFA and NH_3-N concentrations. Data were analyzed as repeated measures and orthogonal polynomial contrasts were used to determine the effects of supplementation level on ruminal fermentation and blood parameters. As the level of supplementation increased, mean ruminal pH (6.73, 6.83, 6.74, 6.65 for 0, 0.45, 1.36, and 2.27 kg/d, respectively; $P = 0.03$) and concentrations of BUN and NH_3-N ($P < 0.001$) decreased linearly. Molar proportions of acetate decreased ($P < 0.001$) whereas molar proportions of propionate ($P < 0.001$) and butyrate ($P = 0.007$) increased linearly as the level of supplementation increased. Total VFA concentrations were affected cubically ($P = 0.005$) by liquid supplementation. Feeding up to 2.27 kg/d of the liquid supplement to steers consuming bermudagrass hay caused a decrease in ruminal pH; however, values were not below 6.0, which is the threshold known to affect fiber digestion. Therefore, we concluded that the inclusion of up to 2.27 kg/d of a 50:50 mixture molasses:crude glycerol in forage based diets fed to growing steers, positively affected ruminal fermentation, increasing propionate concentrations at the expense of acetate, which should improve animal performance.

Key Words: crude glycerol, forage, molasses

605 Total-tract pdNDF digestibility in heifers fed with TMR or pelleted ration. Elena Bonfante*, Mattia Fustini, Nicola Negri, Alberto Palmonari, Giorgia Canestrari, and Andrea Formigoni, *DIMEVET, University of Bologna, Ozzano Emilia, Italy.*

The aim of this study was to evaluate the total-tract pdNDF digestibility (TTdpdNDF) in heifers fed with the same ration as TMR or pellet. Eight tie-stall heifers (age 336 ± 30d, BW 346 ± 35kg) were used in a 12 weeks study (4 periods of 3 weeks: 2 adaptive and 1 for data collection). Diets had the same ingredients (hay 41.8%, barley straw 27.4%, sunflower 13.7%, grain 16.4%, NaCl 0.7%) but fed in 2 physical forms: TMR and PELLET (Ø = 8mm), thus differing in structure, evaluated through the physical effective factor (pef = 38.73% in pellet, 66.12% in TMR). Heifers, divided in 2 groups, were fed ad libitum, individually, with the 2 diets in alternate periods, and dry matter intake (DMI), DMI/BW, water intake, rumination time, rumen temperature and pH were evaluated daily. Fecal samples for TTdpdNDF determination were collected and average daily gain (ADG) was calculated at the end of each period. Data of the third week of each period were statistically analyzed with ANOVA for repeated measures, while ADG and TTdpdNDF by *t*-test (Statistica v10). The DMI and DMI/BW was higher ($P < 0.001$) in pelleted diet (11.49 ± 1.72 vs. 9.03 ± 1.33 kg) (3.05 ± 0.33 vs. 2.40 ± 0.24%) and water intake increased ($P < 0.01$) during pellet administration (52.0 ± 13.0 vs. 41.0 ± 9.0 L/d). ADG at the end of the study was 1.0 ± 0.45 kg/d. The rate for the pellet diet was greater but not significantly different (1.07 ± 0.32 vs. 0.90 ± 0.54 kg/d). Rumination time was considerably lower ($P < 0.001$) with pellet than TMR (256 ± 58 vs. 521 ± 66 min/d). Diet had no effect on rumen temperature or pH. TTdpdNDF, evaluated using $uNDF_{240\ h}$ as a marker, was statistically different between pellet and TMR (87.88 ± 3.72 vs. 91.45 ± 1.92%). The results of this study suggest that a complete pelleted diet was well accepted by animals, as showed by higher DMI. Moreover, even if rumination time dropped with the pelleted diet, ruminal pH was maintained similar to those with TMR. TTdpdNDF, despite the difference between 2 diets was significant, maintained high values in both diets. In conclusion, a complete pelleted diet, designed

to provide sufficient amount of physically effective fiber, could be fed to growing ruminants without generating digestive disorders.

Key Words: TTdpdNDF, physical effective fiber, heifer nutrition

606 Rumen degradability of wheat straw is related to changes in lignin properties after fungal treatment. Sandra J. A. van Kuijk*[1], Anton S. M. Sonnenberg[2], Johan J. P. Baars[2], Wouter H. Hendriks[1], and John W. Cone[1], *[1]Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands, [2]Plant Breeding, Wageningen University, Wageningen, the Netherlands.*

The aim was to improve the rumen degradability of wheat straw (WS), which has relatively high cell wall content. Plant cell walls consist of hemicellulose and cellulose that are bound to lignin. These carbohydrates can be an important source of energy for rumen microbes. However, rumen microbes cannot degrade lignin, which blocks the availability of the carbohydrates. The availability of carbohydrates can be increased when lignin is removed in a pre-treatment. In nature, dead plants can be degraded by fungi. Some fungal species degrade lignin without consuming cellulose during vegetative growth. One of the selective lignin degrading fungi, *Lentinula edodes* was used to test the improvement in rumen degradability of WS. Two conditions were tested in triplicate: autoclaved WS inoculated with *L. edodes* and autoclaved WS as control. After 12 weeks of incubation at 24°C, rumen degradability was determined with the in vitro gas production (IVGP) technique (Cone et al., 1996). Lignin, hemicellulose and cellulose content were determined according to the methods described by Van Soest et al. (1991). Changes in chemical composition and IVGP upon fungal treatment were compared with the control, using the generalized linear model method in SAS (v9.3). To test the effect of changes in lignin structure and properties, pyrolysis gas chromatography-mass spectrometry (py-GC/MS) was done on fungal treated WS and the control. *L. edodes* treatment for 12 weeks increased ($P < 0.05$) IVGP of WS compared with untreated WS. Cellulose content was unchanged, while hemicellulose and lignin content decreased ($P < 0.05$). In addition to a decrease in total lignin, py-GC/MS showed an increasing amount of lignin degradation products. Upon *L. edodes* treatment not only a total degradation of lignin occurred, but the composition of lignin also changed. Lignin in WS consists of syringyl (S) and guaiacyl (G) units in a 1:1 ratio. *L. edodes* degraded more S than G units, since the S/G ratio decreased. This decrease in S/G ratio was correlated to an increase in IVGP. We conclude that the *L. edodes* treatment increased the IVGP of WS, which was correlated to both lignin content and composition.

Key Words: rumen degradation, plant cell wall, fungal pretreatment

607 Inoculant effects on silage fermentation and aerobic stability of sorghum wet ethanol co-product/roughage blends. Pedro R. B. Campanili*, Jhones O. Sarturi, Michael L. Galyean, Sara Trojan, Lauren A. Ovinge, Barbara J. M. Lemos, Alex Thompsom, David Klein, Mendu Venugopal, and Bradley Johnson, *Texas Tech University, Lubbock, TX.*

Anaerobic storage of blends containing sorghum wet distillers grains plus solubles (WDGS) and low-quality roughages with or without microbial inoculants (DeLaval Manufacturing) on fermentation, losses, and aerobic stability were evaluated. Experimental silos (n = 90; 18.9-L plastic containers) were assigned randomly to 1 of the 15 treatments using a 3 × 3 + 6 treatment arrangement as follows: 65:35 blend of WDGS and one of the following roughage sources: wheat straw (WS), corn stalks (CS), and alfalfa hay:cottonseed hull (CSH) blend, with or without inoculant (n = 5; inoculant A and B, all roughages; C, D, and E only for CSH); roughages with no inoculants (cotton burrs (CB), and corn dry DGS:WDGS blend (52:48; DGS-blend); and pure WDGS. Data were analyzed using GLIMMIX procedures of SAS with d 0 as a covariate. Regardless of inoculation, pure WDGS showed greater ($P < 0.01$) total DM losses (8 vs. 2%), and less acetate (0.44 vs. 0.80%, DM basis) than silage blends. Low acetate concentration (0.13% of DM) was observed on d 0, regardless of treatment. Disappearance of fiber fractions was greater ($P < 0.01$) for blends than for pure WDGS. Inoculation tended ($P = 0.07$) to increase ADF digestibility for the CSH blend, and increased ($P < 0.01$) fiber disappearance for WS blends. Greater ($P < 0.01$) disappearance of NDF and ADF was observed for the WS blend plus inoculants A or B than for the average of other roughage treatments (16.80 *vs*. 4.57%, and 12.27 *vs*. 0% for NDF and ADF, respectively). Blends of CSH and CS had less ($P \leq 0.04$) fat loss when inoculant A or B was applied vs. those without inoculant. The CSH blends took more time ($P = 0.04$; 6 h) to lose aerobic stability than other treatments. Independent of inoculation, pH and losses increased ($P < 0.01$) during the aerobic stability for WS, but was less for CSH, with CS blends being intermediate. Inoculation positively affected fermentation profile of ensiled WDGS/low-quality roughage blends, although this depended on type of roughage. Silo post-opening management of blends must be considered once it can account as an important source of loss.

Key Words: distillers, ensiling, stability

609 Effects of urea and fibrolytic enzymes on chemical composition, in vitro digestibility, in vitro degradability, and gas production of cotton gin trash. Alexandro Pereira Andrade[1,2], Mauro Pereira de Figueiredo[2], Danilo Gusmao de Quadros*[1], Joel Queiroga Ferreira[2], and Yann Santos Luz[2], *[1]Bahia State University, Barreiras, Bahia, Brazil, [2]Southwest Bahia University, Vitoria da Conquista, Bahia, Brazil.*

The objective of this study was to evaluate the effects of treatment with urea (0 and 6%) and fibrolytic enzymes (0, 2, 4 and 6%; 75% cellulase and 25% hemicellulase) on chemical composition, IVDMD, dry matter in vitro degradability (IVDEG), and gas production of cotton gin trash. A completely randomized design in a 2 × 4 factorial design was used, with 4 replications. Two kilograms of residue were treated by 60 d with urea dissolved in water, applied to raise the moisture to 25%. The enzymes were sprayed, acting for 24 h. There was significant interaction between urea and fibrolytic enzymes for DM, EE, CP, and ADF ($P < 0.05$). Urea treatment increased CP in 157% ($P < 0.05$). Enzymatic hydrolysis affected quadratically CP in the untreated residue, but positively linear when it was ammoniated. Urea and enzymes were an effective way in reducing cell wall constituents ($P < 0.05$). The IVDMD was greater with ammoniation and when the enzymes doses were increased ($P < 0.05$). There was no significant interaction between urea and fibrolytic enzymes on IVDEG ($P < 0.05$). Although the values of the fraction *a* decreased from 19.1% to 13.6%, ammoniation increased *b* and *c* fractions from 34.2% to 40.4%, and from 0.038 to 0.045, respectively ($P < 0.05$). Using 5% of passage rate, the addition of urea reduced the effective degradability from 33.9% to 32.6%. No effect of urea was observed for potential degradability ($P > 0.05$). Fibrolytic enzymes did not affect the soluble fraction ($P > 0.05$); however, they increased linearly all other IVDEG parameters. Urea did not affect the rate of digestion of K_{d1} and K_{d2} ($P > 0.05$), while the enzymes just decreased linearly K_{d2}. The Vf_1 and Vf_2 were greater with ammoniation ($P < 0.05$), increasing from 16.2 to 51.2 and 51.2 to 62.4 mL/g, respectively, and they were increased linearly with the enzymes doses. The lag time was affected by the interaction between urea and enzymes ($P < 0.05$), being

different in the ammoniated material without or with 2% of enzymes. Urea and fibrolytic enzymes associated treatment enhanced nutritional value of cotton gin trash.

Key Words: ammoniation, cellulase, hemicellulase

610 Effects of *Saccharomyces cerevisiae boulardii* supplementation during the receiving period on growth efficiency, and behavioral and health responses in newly weaned beef heifers. Monica L. Jenks*[1], Gordon E. Carstens[1], Abbey G. Cupples[1], Jason E. Sawyer[1], William E. Pinchak[2], Kerry S. Barling[3], and E. Chevaux[3], *[1]Department of Animal Science, Texas A&M University, College Station, TX, [2]Texas A&M AgriLife, Vernon, TX, [3]Lallemand Animal Nutrition, Milwaukee, WI.*

Objectives of this study were to evaluate the effects of live yeast (LY; *Saccharomyces cerevisiae boulardii* strain I-1079; 0.35×10^9 cfu/g ProTernative) supplementation during the receiving period on growth efficiency, feeding behavior, activity and vaginal temperature in 72 newly weaned beef heifers (initial BW of 203 ± 22 kg). Immediately upon weaning, heifers were vaccinated (Pyramid 5) and ship stressed (800 km) before being returning to the research center. Upon arrival, heifers were allotted to 1 of 4 pens each equipped with 3 GrowSafe feed bunks, and pens to 1 of 2 treatments (n = 36) consisting of standard receiving diet (ME 2.36 Mcal/kg, CP 16.5% DM) without LY, and control diet containing LY (5 g ProTernative/kg diet; Lallemand Animal Nutrition). Temperature sensors (iButton) were placed intra-vaginally (CIDR) to record temperature, and HOBO devices attached (hind leg) to measure physical activity for the first 14 d (n = 18). LY treatment did not affect morbidity rate (10.4%), vaginal temperature (39.2 ± 0.2°C), or frequency (16.6 ± 2.2 events/d) and duration (46 ± 5 min/event) of standing bouts. ADG tended ($P < 0.1$) to be greater for LY heifers during the first 28 d (0.625 vs. 0.432 ± 0.08 kg/d), but was not affected by LY treatment during the 56-d study. LY treatment did not affect DMI, but DMI increased as the study progressed from 2.06 ± 0.22 (first 14 d) to 2.91 ± 0.19% of BW during the 56-d study. LY heifers consumed more ($P < 0.05$) meals (16.8 vs. 14.6 vs. ± 1.1 events/d) that were shorter ($P = 0.08$) in length (12.8 vs 14.9 ± 1.2 min/event) and smaller ($P < 0.05$) in size (0.48 vs 0.55 ± 0.04 kg/event) and at a slower ($P < 0.05$) meal-eating rate (4.61 vs. 5.54 ± 0.39 g DM/min) compared with control heifers. Moreover, heterogeneities of DMI (SD = 0.59 vs. 0.92 kg/d) and RFI (SD = 0.48 vs. 0.73 kg/d) were less ($P < 0.05$) in LY than control heifers. While the LY treatment did not affect growth efficiency or health status, supplementation with live-yeast may have favorably affected meal patterns of newly weaned beef heifers.

Key Words: live yeast, morbidity, feeding behavior

611 Direct addition or pre-incubation of exogenous xylanase affects in vitro gas production kinetics, degradability and ruminal fermentation activities of three fibrous feeds. M. M. Y. Elghandour[1], A. E. Kholif[2], S. Lopez[3], A. Z. M. Salem*[1], and T. A. Morsy[2], *[1]Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico, [2]Dairy Science Department, National Research Centre, Giza, Egypt, [3]Instituto de Ganadería de Montaña (IGM) CSIC-Universidad de León, Departamento de Producción Animal, Universidad de León, León, Spain.*

The use of exogenous fibrolytic enzymes (EFE) technology to improve the utilization of fibrous feeds is a novel approach for enhancing feed utilization ruminants performance. The effects of EFE xylanase on in vitro fermentation characteristics of maize stover (MS), oat straw (OS) and sugarcane bagasse (SCB) were examined using an in vitro gas production (GP) technique. Three doses of xylanase plus EFE (Dyadic PLUS, Dyadic International Inc., Jupiter, FL) in liquid form were used at 0 (control), 60 (low), 120 (medium) and 240 (high) µg/g DM of substrate. Ruminal GP, CH_4 and CO_2 concentrations were recorded at 2, 4, 6, 8, 10, 12, 14, 24, and 48 h of incubation at 2 methods of application (direct or 72-h pre-incubation). Separate ANOVA was performed for each feedstuff (maize stover, oat straw and sugarcane). Each experiment was laid down in a 2 (mode of EZ application either by pre-treatment or directly) × 3 (rates of application of 60, 120, and 240 µg xylanase/g DM) factorial plus one control (no enzyme additive) completely random design, for a total of 7 experimental treatments. The analysis was performed using the PROC MIXED of SAS for factorial arrangements of treatments plus one control. Increased ($P < 0.05$) GP at different incubation times was observed with EFE doses addition for the incubated fibrous feeds versus control. The pre-incubation versus direct addition of EZ increased GP of the 3 feeds. However, the direct addition of EFE improved ($P < 0.05$) DM, neutral detergent fiber (NDF), and acid detergent fiber (ADF) degradabilities. Substrates incubated with higher doses of EFE increased ($P < 0.05$) GP, DM, NDF, and ADF degradabilities versus low and medium doses. Enzyme decreased ($P < 0.05$) rumen pH of MS and SCB compared with control. Ammonia-N and total volatile fatty acids (VFA) was unaffected ($P > 0.05$) by EFE application, doses, and application methods in MS and OS. However, total and individual VFA increased ($P < 0.05$) when SCB was incubated with xylanase and this was EZ dose dependent ($P < 0.05$). Methane and CO_2 concentrations were not affected ($P > 0.05$) with EZ application methods or its doses in MS and OS. However, increasing EFE doses with SCB increased CH_4 ($P = 0.013$) and CO_2 concentrations ($P = 0.006$). It could be concluded that application of xylanase enzyme improved GP and rumen fermentation activities. However, the effects were substrate, application methods, and EFE doses dependent, and increasing EZ doses had more effects than low doses.

Key Words: enzyme, fibrous feed, gas production

612 Effects of essential oils and exogenous enzymes for finishing Nellore cattle in feedlot. Murillo Alves Porto Meschiatti[1], Lucas Agostinho Pellarin[1], João Ricardo Rebouças Dórea[2], Tiago Sabella Acedo[2], Luis Fernando Tamassia[2], Cristina Simões Cortinhas[2], and Flávio Augusto Portela Santos*[1], *[1]University of São Paulo, Piracicaba, SP, Brazil, [2]DSM Produtos Nutricionais Brasil SA, São Paulo, SP, Brazil.*

The objective with this experiment was to evaluate the combination of essential oils and exogenous enzymes on performance of Nellore bulls finished in feedlot. Three hundred Nellore bulls (initial BW = 330 ± 33 kg) were fed during a total period of 90 d with diets containing 82.5% corn, 8.5% sugarcane bagasse, 5% soybean meal, 3% mineral, 1% urea and were randomly allocated to 50 pens. Animals were blocked based on initial BW. The treatments were MON (Monensin, Tortuga – 26 mg/kg DM), CRINA (Essential Oils: Crina Ruminants, DSM – 90 mg/kg DM), CRINA+MON (90 and 26 mg/kg DM, respectively), CRINA+RUM (CRINA + α-amylase: Ronozyme RumiStar, DSM – 90 and 560 mg/kg DM, respectively) and CRINA+RUM+P (CRINA+RUM+Protease: Ronozyme Proact, DSM – 90; 560 and 840 mg/kg DM, respectively). Response variables included: dry matter intake (DMI), average daily gain (ADG), feed efficiency (ADG/DMI), final body weight (final BW), hot carcass weight (HCW) and dressing. The data were analyzed using PROC MIXED of SAS and means were compared by Tukey test considering the block as random effect and treatments as fixed effects.

The DMI, ADG, final BW, HCW were greater for CRINA+RUM in comparison with MON, CRINA+MON and CRINA+RUM+P (Table 1). Cattle fed CRINA+RUM had improvements 9.4% in DMI, 12.2% in ADG, 3.7% in final BW and 4,6% HCW compared with cattle fed MON diets. In conclusion, Nellore bulls fed diets containing amylase and essential oils were slaughtered heavier than bulls fed monensin diets.

Table 1 (Abstr. 612). Combination of essential oils and exogenous enzymes on feedlot performance of finishing Nellore bulls

Item	MON	CRINA	CRINA+ MON	CRINA+ RUM	CRINA+ RUM+P	*P*-value	SEM
Initial BW, kg	330.8	330.8	330.9	330.6	330.7	0.5422	10.9
Final BW, kg	476.4^{b}	486.5^{ab}	474.1^{b}	494.1^{a}	463.1^{c}	0.0001	12.6
DMI, kg/d	8.64^{bc}	9.24^{ab}	8.50^{c}	9.45^{a}	8.44^{c}	0.0001	0.27
ADG, kg/d	1.615^{b}	1.722^{ab}	1.584^{b}	1.812^{a}	1.465^{c}	0.0001	0.06
FE, G:F	0.187^{ab}	0.187^{ab}	0.188^{ab}	0.193^{a}	0.175^{b}	0.0001	0.005
HCW, kg	264.8^{b}	272.5^{ab}	262.3^{b}	277.0^{a}	257.4^{c}	0.0002	8.01
Dressing, %	55.5	56.0	55.5	56.1	55.8	0.2652	0.25

Key Words: additive, beef, feedlot

613 Effect of supplementing grazing cattle with *Saccharomyces cerevisiae* on fiber digestibility and rumen cellulolytic bacteria population. D. O. Sousa*[1], M. A. Arcari[1], M. V. Biehl[1], A. V. Pires[1], E. Chevaux[2], L. J. Mari[2], and L. F. P. Silva[1], *[1]University of São Paulo, Pirassununga, São Paulo, Brazil, [2]Lallemand Animal Nutrition, Aparecidada de Goiânia, Goiás, Brazil.*

The aim of this study was to evaluate the effect of live yeast (*Saccharomyces cerevisiae* CNCM I-1077) supplementation on fiber digestibility and rumen population of cellulolytic bacteria of grazing Nellore cattle, throughout the 4 seasons of the year. Eight rumen cannulated steers were used in a completely randomized design in a 2 × 4 factorial arrangement of treatments: with or without yeast and seasons of the year (spring, summer, fall, and winter). The live yeast product (Levucell SC Farm, Lallemand, Brazil) was given daily, in capsules, via the rumen cannula, to achieve 8×10^9 cfu per animal. Animals were kept on an intensive rotational grazing system throughout the year, receiving similar mineral supplementation. Every 45 d, in situ rumen NDF degradability (NDFD) of 5 reference forages was determined after 24 and 48 h incubation: (1) corn silage, (2) bermudagrass hay, (3) sugarcane silage, (4) marandu-grass, and (5) guinea grass (mombaça-grass). In addition, a composite sample representing the liquid and solid phases of the ruminal content was collected for DNA extraction and real-time PCR quantification of 4 rumen cellulolytic bacteria species (*Butyrivibrio fibrisolvens*, *Fibrobacter succinogenes*, *Ruminococcus flavefaciens* and *Ruminococcus albus*). On average, live yeast supplementation increased 24 h-NDFD by 6.8% throughout the year (40.7 vs. 38.1%, $P < 0.01$), without a yeast × season interaction ($P = 0.45$), or yeast × roughage interaction ($P = 0.39$). When analyzed after 48h of rumen incubation, there was a yeast × season interaction ($P = 0.08$). Live yeast supplementation increased 48h-NDFD only during the autumn months ($P = 0.01$). Among the 4 species evaluated, *R. flavefaciens* was the most prevalent cellulolytic bacteria, and yeast supplementation increased by 78% ($P < 0.01$) the relative population of *R. flavefaciens* in the rumen, and this effect was more pronounced during the summer and spring months (yeast × season interaction, $P = 0.10$). Supplementation with live *Saccharomyces cerevisiae* increased fiber digestibility of roughages in steers grazing tropical grasses, and this effect was related to the greater population of *R. flavefaciens* in the rumen.

Key Words: cellulolytic bacteria, fiber digestibility, yeast

614 Effects of enzymatically hydrolyzed yeast supplementation and supplementation frequency on immune parameters among periparturient beef cows and calves. Janine E. Swartz*, Derek W. Brake, Elaine E. Grings, Eric A. Nelson, Cody L. Wright, Julie A. Walker, Ethan J. Blom, and George A. Perry, *South Dakota State University, Brookings, SD.*

We evaluated effects of enzymatically hydrolyzed yeast (EHY) and supplementation frequency (FREQ) on immune parameters among beef cows and calves. Eighty multiparous (parity = 4.2 ± 0.3) cows were fed a common brome hay-based diet (CP = 8.0 ± 0.1%). Cows were blocked by expected calving date and stratified by BCS within block before random assignment to treatment. Beginning 88 ± 5 d prior and up to parturition, cows were provided 1 kg daily or 3 kg every 3 d of a soybean hull-based supplement that contained 0 or 3 g/kg EHY. The daily supplement was designed to meet ruminal N requirements. Cows were vaccinated against rotavirus at 62 and 48 ± 5 d before parturition. Jugular blood was collected from cows at 62, 48, 40, 24 and 14 d before parturition. At parturition, colostrum was milked from cows before feeding to calves and jugular blood was collected from cows and calves. Subsequently, calf plasma was collected at 2 and 14 d after parturition. Calf plasma IgG concentration increased (*Quadratic* < 0.01) as age increased and the passive transfer status among calves was 'excellent' (i.e., calf 2 d plasma IgG = 37 ± 1.9 g/L; APHIS, 2010). Nonetheless, plasma IgG was greater ($P = 0.03$) among calves born to cows supplemented EHY; FREQ had no effect on plasma IgG in calves. Despite differences among calf plasma IgG concentrations, there was no effect of EHY or FREQ on colostrum yield, colostrum concentration of IgG or calf intake of colostrum. Similarly, apparent efficiency of IgG absorption and sera rotavirus neutralization titers among calves aged 14 d was not affected by treatment ($P \geq 0.36$). Cow plasma IgG decreased (*Quadratic* = 0.02) as cows neared parturition and was not affected by EHY ($P = 0.56$) or FREQ ($P = 0.14$). We observed a quadratic increase in rotavirus neutralization titers in cow sera in response to vaccination, as expected. Sera rotavirus neutralization titers were not affected by EHY ($P = 0.70$) nor FREQ ($P = 0.42$). These data suggest that EHY but not FREQ may affect passive transfer of IgG.

Key Words: immunity, cattle, supplementation