121 A modified glucomannan as a method for mitigating fescue toxicosis. I. Cattle performance. S. A. Gunter*, J. D. Shockey, P. A. Beck, and C. A. Masino, *University of Arkansas*, *Hope*.

To evaluate the efficacy of a modified glucomannan to mitigate fescue toxicosis, 60 Angus cross (281 ± 7.0 kg) steer calves were randomly assigned to 1 of 12 2-ha pastures of endemically-infected tall fescue in April of 2004 and 2005 and allowed to grazed for 133 d. The treatments were 1 of the 3 following: 1) non supplemented (**CTL**), 2) a self-fed liquid supplement (Pasture Plus 34/6; QLF, Inc., Dodgeville, WI; **SUP**), or 3) the liquid supplement containing a modified glucomannan (FEB-200; Alltech, Inc., Nicholasville, KY; **FEB**). Target intake for the supplements was 0.91 to 1.40 kg/d with FEB delivering 10 to 20 g/d of the modified glucomannan. Steers were weighed every 28 d and feed intake was monitored weekly. Data were analyzed by period (28 d for Periods 1, 2, 3, and 4; 20 d for Period 5) with Proc Mixed using treatment and year as the fixed and random effects, respectively. Least-square means were separated using contrasts: 1) CNL vs the average of SUP and FEB, 2) SUP vs FEB, and 3) CNL vs FEB. Supplement intake in Periods 1 and 2 did not differ ($P \geq 0.36$) between SUP and FEB, in Period 3 intake (kg/d) tended to be greater ($P = 0.08$) FEB (1.7) compared to SUP (1.1), and in Periods 4 and 5 intake did not differ ($P \geq 0.22$). Average daily gain (kg) was greater ($P = 0.04$) for supplemented cattle than CTL in the Period 2, but did not differ ($P \geq 0.11$) in any other period. Across all Periods (133 d), FEB steers (0.54 kg/d) gained BW more quickly ($P = 0.03$) than SUP steers (0.41 kg/d); however, FEB steers did not gain BW more quickly ($P = 0.21$) than CNL steers (0.50 kg/d). Beginning BW did not differ ($P \leq 0.62$) among treatments and by the end of Period 5 the BW (kg) of the average of the supplement cattle (348) did not differ ($P = 0.96$) from CTL steers (348). However, the BW (kg) of FEB steers at the end of Periods 4 (348) and 5 (358) were 5 and 6% heavier ($P \leq 0.03$), respectively, than SUP steers (333 and 338, respectively). Overall, there was no beneficial effect noted for supplementation with these steers grazing infected tall fescue, but there seems to some beneficial effects of modified glucomannan.

Key Words: Beef, Glucamannan, Fescue toxicosis

122 A modified glucomannan as a method for mitigating fescue toxicosis. II. Cattle behavior. J. D. Shockey*, S. A. Gunter, P. A. Beck, and C. A. Masino, *University of Arkansas*, *Hope*.

This study was conducted from April to August in 2004 and 2005 to examine the effect of supplementation and modified glucomannan on animal behavior. Sixty Angus cross steers (281 ± 7.0 kg) assigned to 1 of 12 pasture of K-31 tall fescue infected with the endemic endophyte at a stocking rate of 2.5 steers/ha. Pastures of steers (n = 5) were randomly assigned to 1 of the 3 following treatments: 1) non supplemented controls (**CTL**), 2) a self-fed liquid supplement (Pasture Plus 34/6; QLF, Inc., Dodgeville, WI; **SUP**), 3) or the same liquid supplement containing a modified glucomannan (FEB-200; Alltech, Inc., Nicholasville, KY; **FEB**) intended to supply 10 to 20 g/animal daily. All groups received a free-choice mineral in weathervane mineral feeders. Behavioral observations were collected bimonthly every 60 min (2004) or every 30 min (2005) between 0630 and 2030. Observations were classified into six activities: consuming supplement, grazing, eating mineral, drinking, lying, or standing. Data were analyzed by month with Proc Mixed with treatment (fixed), and year and sampling day (random) as effects. Least-square means were separated using contrasts: 1) CNL vs supplemented steer (average of SUP and FEB), 2) SUP vs FEB, and 3) CNL vs FEB. There was no differences ($P > 0.05$) noted between groups in percentage of time spent standing, lying, drinking or at the mineral feeder. Across months, CNL and FEB steers spent an average of 4 and 5%, respectively, of their time consuming supplements. However, the CNL steers spent a greater ($P < 0.05$) percentage of time grazing (51%) than the SUP steers (41%) and FEB steers were intermediate (46%) to the SUP and CNL steers. Supplemented steers spent 17% less time grazing than the CNL steers and the majority of this reduction in grazing time seems to be accounted for by time at supplement feeders. The differences noted in grazing times reflected differences reported in cattle performance (Abstract I; Gunter et al., 2006). Perhaps the additional time spent grazing for FEB steers led to the increased performance associated with the modified glucomannan addition to the liquid supplement.

Key Words: Beef, Glucomannan, Fescue toxicosis

123 Effects of *Saccharomyces cerevisiae* (Sc47) on the rumen digestion, fermentation and protozoa population of bulls fed either alfaalfa hay or corn silage diet. A. Nikkhah* and E. Ghasemi, *Tehran University*, *Karaj, Tehran, Iran*.

The objective of this study was to determine the effect of Sc (47.8×10^9 cfu/g) on alfaalfa hay (AH) and corn silage (Cs) fed to bulls. Four ruminally fistulated bulls (two Holstein and two Sistani) were used in a Latin Square design with factorial arrangement of treatments (two forage sources and two level of Sc (Makian Daroo, Iran)) and four periods. Bulls were fed individually twice a day as total mixed ration (TMR) at maintenance level and Sc was top-dressed once per day. The diet consisted of either 46.15% AH or 48.84% Cs, 24% straw and 28% concentrate (DM basis). Rumen degradability of DM, CP, NDF and ODM was measured by Dacron bag at 0, 3, 6, 12, 24, 48 and 72h. Ruminal fluid samples were collected from carnial-ventral site of rumen at 0, 3, 6 and 12h to determine rumen pH and concentration of VFA and N-NH_3. Samples for counting rumen protozoa were also drawn from rumen fluids. DM degradation of AH and Cs was increased at 3h incubation by Sc (46.5% vs. 48.53%, $P<0.1$). In situ DM degradation of TMR was also increased at 72 h incubation. CP disappearance of AH, Cs and TMR were unaffected by the addition of Sc. Addition of Sc caused an increment in degradability of ODM at 3h (38.86% vs. 40.52%, $P<0.1$), 72h (75.18% vs. 76.28%, $P<0.05$) and forage NDF degradability at 3h (1.29% vs. 4.39%, $P<0.05$). Mean daily N-NH_3 (mg/dL) concentration was decreased by Sc but no effect was observed at 0, 3, 6 and 12h. Concentration of total VFAs and percentage of propionate were higher and acetate to propionate ratio was lower in diet supplemented with Sc. However there were interactions between Sc and forage source at 3 and 12h post feeding. For AH based diet, acetate to propionate was reduced and for Cs based diet was increased by Sc. Protozoa population was reduced at 3h (183.63×10^3 vs. 148.06×10^3 per mL) and 12h (161.69×10^3 vs. 146.68×10^3) and entodiniomoroph was also reduced at 12h (155.50×10^3 vs. 140.54×10^3). Holotrich was unaffected by Sc. The results of this investigation indicate that Sc can slightly affect most rumen parameters and can improve efficiency of digestion.

Key Words: S. Cerevisiae, Fermentation, Bull

124 Effects of essential oils on rumen microbial fermentation evaluated in vitro. L. Castillejos*[1], S. Calsamiglia[1], J. Martin-Tereso[2], and H. ter Wijlen[2], [1]*Universitat Autonoma de Barcelona*, *Bellaterra, Spain*, [2]*Nutreco Ruminant Research Center*, *Boxmeer, The Netherlands*.

The effects of ten essential oils (clove, hyssop, lavandin, lavender, thyme, oregano, rosemary, sage, savory and tea tree) were evaluated in an in vitro 24 h batch culture of diluted rumen fluid (Tilley and Terry, 1963) at pH 6.50. A 10 to 90 forage to concentrate diet (16% CP; 32% NDF; 38% starch) typically fed to beef cattle in a barley-beef system was used as substrate. Treatments were: negative control (CTR), positive control (10 mg/L of monensin), and three different doses of each essential oil (5, 50, and 500 mg/L). After 24 h, the pH was determined in culture fluid and samples were collected to analyze ammonia N and volatile fatty acid (VFA) concentration. Data were analyzed using PROC MIXED of SAS (1996) and differences declared at $P < 0.05$. Monensin increased total VFA concentration, propionate and valerate proportion, and decreased acetate and butyrate proportion, the acetate to propionate ratio and ammonia N concentration. Lavender did not modify rumen microbial fermentation and lavandin and oregano (500 mg/L) inhibited rumen microbial fermentation decreasing total VFA concentration, which suggests that these essential oils may not be nutritionally beneficial to beef cattle. However, the lowest dose of oregano increased total VFA concentration by 39-56%. Thyme and savory increased total VFA concentration and decreased ammonia N concentration, but also reduced final rumen pH. The 500 mg/L doses of rosemary, hyssop, sage, tea tree and clove acted as monensin increasing propionate and valerate proportion, and reducing acetate proportion, butyrate proportion and the acetate to propionate ratio without reducing total VFA concentration. Clove at 500 mg/L was the only essential oil that increased rumen pH without reducing total VFA concentration. Most of essential oils demonstrated an important activity modifying rumen fermentation. Careful selection and combination of these essential oils may allow the manipulation of rumen fermentation.

Key Words: Essential oils, Rumen fermentation

125 Effect of CRINA RUMINANTS AF, a mixture of essential oil compounds, on finishing beef steer performance. N. Meyer*[1], G. Erickson[1], T. Klopfenstein[1], P. Williams[2], and R. Losa[2], [1]*University of Nebraska*, *Lincoln*, [2]*Intervet*, *Millsboro, DE*.

The objective of this study was to determine the potential of an essential oil additive to improve steer growth performance and carcass characteristics. Three hundred seventy six yearling beef steers (398 + 35 kg) were blocked by initial BW (3 blocks for light, middle, and heavy), and assigned randomly to one of four treatments (10 pens per treatment). Treatments were 1) Control (CON) with no active dietary ingredients, 2) CRINA RUMINANTS AF (CR) added at a target consumption of 1.0 g/hd/d, 3) CRINA RUMINANTS AF plus tylosin (CR+T), and 4) monensin plus tylosin (M+T). Diets consisted of 66.0% high moisture corn, 16.5% dry rolled corn, 7.5% alfalfa hay, 5% molasses, and 5% supplement. There were no significant differences ($P>0.05$) for initial BW, final BW, and ADG. Steers fed M+T had lesser ($P<0.05$) DMI than other treatments (Table 1). Feed efficiency was significantly greater ($P<0.05$) for the CR+T and M+T fed steers compared with CON steers. Hot carcass weight, 12th rib fat thickness, LM area, and marbling score were not significantly different ($P>0.05$) among treatments. Treatments containing tylosin had significantly fewer ($P<0.01$) liver abcesses as compared to the other treatments with values of 26.25, 15.65, 7.75, and 5.55% (% total abscesses) for CON, CR, CR+T, and M+T, respectively. The results of this study suggest that addition of CRINA RUMINANTS AF plus tylosin or monensin plus tylosin improved feed efficiency and decreased liver abscesses compared to no additives.

Table 1.

	CON	CR	CR + T	M + T	SE	P-Value
DMI (kg/d)	12.2[b]	12.1[b]	12.0[b]	11.5[c]	0.23	<0.01
ADG (kg/d)	1.77	1.81	1.83	1.79	0.08	0.52
G:F	0.145[b]	0.151[bc]	0.153[c]	0.156[c]	0.002	0.03

Key Words: Cattle, Essential oils, Feed additives

126 Effects of concentration and duration of Rumensin application on milk production efficiency in multiparous Holstein cows. A Arieli*[1], C. M. Martinez[2], T. W. Cassidy[2], and G. A. Varga[2], [1]*Hebrew University of Jerusalem*, *Rehovot, Israel*, [2]*Pennsylvania State University*, *University Park*.

Six multiparous Holstein cows (initial DIM = 135, BW = 653 kg) were used in a replicated 3 X 3 Latin square design experiment with 21d periods to evaluate the effects of Rumensin dose and duration of application period on milk production, feed intake and metabolic traits. Treatments were TMR top-dressed with 0 (C, control), and two levels (L) of Rumensin at 300 (L1) or 600 (L2) mg /day. Diet contained 16.2% CP, 31% NDF and 1.72 Mcal NEL/kg of DM. Milk production and feed intake were monitored daily. Milk composition and rumen and blood metabolites concentrations, were assessed on 10d and 21d. Blood and rumen samples were obtained 3 hours after morning feeding. Milk production averaged 41.6 kg/d (SEM 1.0). Intake of DM was less for L2, (22.6 kg/d) than for L1 and C (24.6 kg/d, $P = 0.006$), resulting in a numerically higher milk production efficiency for L2 than for the C (1.80 vs. 1.68 kg milk/kg DM, $P= 0.08$). Blood NEFA, glucose and N-urea concentrations for all treatments were in the normal ranges (treatments means of 113 to 128 meq/l, 62.4 to 65.3 mg/dl and 13.7 to 14.1 mg/dl, respectively). Ruminal propionate molar proportions were higher for L2 than for C (274 vs. 241 mmol/mol, respectively, $P= 0.004$). Ruminal acetate to propionate ratio was lower for cows provided L2 than C (2.2 vs. 2.7, $P= 0.001$). Milk fat and protein percentage were similar among treatments, averaging 3.4% and 3.0%, respectively. For metabolic and production traits, at each Rumensin dose, there was no difference between 10 and 21 d of application ($P> 0.1$). Results from this study indicate that in cows at peak lactation Rumensin effects on ruminal fermentation may be achieved already after 10d of application. Short term application of 600 mg/g Rumensin dose to high yielding cows may support milk production with a concomitant reduction in intake, without an apparent utilization of body energy stores. The correlation ($r = -0.66$, $P= 0.001$) between milk production efficiency and acetate to propionate ratio indicate an involvement of ruminal fermentation in the improved feed utilization of Rumensin supplemented cows.

Key Words: Rumensin dose, Lactation, Duration of application

127 Effects of monensin on dairy cows fed diets differing in fiber source and starch concentration. A. M. Gehman*[1], P. J. Kononoff[1], B. N. Janicek[1], and F. Bargo[2], [1]*University of Nebraska*, *Lincoln*, [2]*University of Buenos Aries*, *Argentina*.

The objective of this experiment was to determine the effects of monensin when dairy cows were fed rations differing in fiber source

and starch content. Twenty Holstein cows (163 ± 26 DIM) were used in a replicated 4 x 4 Latin square with treatments arranged in a factorial manner. The experiment was composed of four 28-d periods, during which the cows were offered one of four rations: 1) 0% DM wet corn gluten feed (CGF), 0 mg/d monensin, 2) 0% DM CGF, 300 mg/d monensin, 3) 38% DM CGF, 0 mg/d monensin, and 4) 38% DM CGF, 300 mg/d monensin. Corn gluten feed replaced a portion of the corn silage, alfalfa haylage, soybean meal, and ground corn contained in the control diet. Diets were formulated to be similar in NDF (34% DM), but diets containing CGF had a lower concentration of starch (21 vs. 25% DM). Data were analyzed using PROC MIXED with period, CGF, monensin, and CGF x monensin as fixed effects and square and cow within square as random effects. Cows consuming the ration containing CGF consumed more DM ($P < 0.01$) than cows not consuming CGF (22.7 vs. 20.2 kg/d). There was a tendency ($P < 0.10$) for a CGF x monensin interaction on DMI. Monensin tended to increase DMI for cows on CGF (23.2 vs. 22.2 kg/d), while it tended to decrease DMI for cows not consuming CGF (19.6 vs. 20.8 kg/d). Cows consuming CGF also tended ($P < 0.10$) to produce more milk than cows not consuming CGF (33.4 vs. 30.6 kg/d), but milk fat percent tended ($P = 0.10$) to be lower (3.91 vs. 4.10%). Cows consuming CGF tended ($P < 0.10$) to produce more milk protein than cows not consuming CGF (1.03 vs. 0.94 kg/d). There were no differences ($P > 0.05$) among treatments in 3.5% fat-corrected milk, milk protein or lactose percentages, milk urea N, milk fat yield, feed conversion, body weight, or body condition score. In this experiment, the inclusion of CGF in the ration increased DMI and tended to increase milk production and protein yield while tending to decrease fat percentage. However, monensin did not affect milk production or other measurements nor did it appear to interact with ration fiber source or starch concentration.

Key Words: Dairy cow, Monensin, Corn gluten feed

128 Effects of molasses and monensin in alfalfa hay or corn silage diets on rumen fermentation, total digestibility and milk production in holstein cows. E. R. Oelker*, C. Reveneau, and J. L. Firkins, *The Ohio State University*, *Columbus*.

Sugar supplementation can stimulate rumen microbial growth and possibly fiber digestibility, however, increasing ruminal carbohydrate availability relative to RDP can promote energy spilling by microbes or decrease rumen pH. RDP supply and rumen pH might be altered by forage source and monensin. Therefore, 7 ruminally cannulated lactating Holstein cows were used in five 28-day periods in a 5x7 incomplete Latin square design to determine the effects of matching molasses supplementation with urea and monensin supplementation on two types of forage-based diets. Four corn silage diets consisted of control (CS), CS + 2% DMB molasses (MOL), CS + MOL + 0.5% urea and CS + MOL + urea + monensin (16g/ton DM). Three alfalfa hay diets consisted of control (AH), AH + MOL and AH + MOL + monensin. Urea was added to CS diets to provide RDP comparable to AH diets with no urea. All diets were balanced to have 16.2% CP, 18.0% forage NDF and 41.0% NFC. The model included the fixed effects of period and treatment, and the random effect of cow. Treatment means were compared by protected LSD. Treatments had no effect on milk or protein yield, but monensin decreased (P=0.04) milk fat from 3.25 to 2.72 % in CS diets but not in AH diets. Total tract OM digestibility (using Cr_2O_3 as a marker) was lower (P=0.03) in AH (63.4%) than CS (73.9%) diets. Treatments had no effect (P>0.12) on NDF digestibility. Rumen ammonia concentration decreased (P=0.02) with MOL but increased with MOL and urea in the CS diets. Additionally, MOL with urea increased MUN in the CS diets (7.6 vs 12.0 mg/dl for MOL vs MOL + U). Ammonia and MUN remained unchanged in the AH diets. Acetate:propionate ratio was higher (P=0.004) in AH (3.03) than CS diets (2.36). Diets did not affect (P>0.21) ruminal pH or DMI. Sugar supplementation might require urea to support microbial protein synthesis in corn silage diets balanced for moderate CP and perhaps especially if monensin is fed.

Key Words: Molasses, Monensin, NDF digestibility

129 Effect of inhibition of methane synthesis on biohydrogenation in the presence or absence of protozoa in continuous culture. S. K. R. Karnati*, C. V. D. M. Ribeiro, J. T. Sylvester, and J. L. Firkins, *The Ohio State University*, *Columbus*.

Ruminal methanogenesis disposes reducing equivalents generated from anaerobic metabolism of sugars. Our objectives were to assess the role of protozoa in biohydrogenation (BH) of dietary unsaturated FA, and to determine if inhibition of methanogenesis increased BH. Four dual-flow continuous culture vessels were modified to retain protozoa and used in a 4 x 4 Latin square design; each experimental period was split into 10-d faunated or defaunated (DEF) sub-periods, each with 7 d of adaptation and 3 d of sampling. Once daily, the fermenters were fed 40 g of a 30:70 concentrate:forage diet containing either no additive, 4% animal-vegetable fat, bromoethanesulfonate (BES 250 µM, methane inhibitor), or monensin (MON 2.5 µM). pH in the fermenters was not controlled and ranged between 6.2 and 6.7. The model included the fixed effects of period, treatment, and filter, and the random effect of fermenter. Means were compared using protected LSD. Digestibilities of OM and NDF were increased ($P<0.05$), whereas total VFA production decreased ($P=0.05$) by DEF. Methanogenesis was not affected by DEF, but acetate:propionate decreased ($P<0.01$) from 3.53 to 3.29 and molar proportions of butyrate ($P=0.09$), isobutyrate and isovalerate ($P<0.01$) increased by DEF. Dietary fat increased the flow (mg/day) of the trans (t) BH intermediates t10 and t11, and the effect was more pronounced by DEF (DEF x treatment interaction $P<0.01$). Because the same interaction persisted for the ratio of total t18:1/18:0, but there was no interaction for total t18:1/total unsaturated FA, DEF probably decreased the rate of the second step of BH. DEF increased VA more than it increased t10 18:1 in fat diets (interaction of VA/t10 ratio). The flow of CLA was unaffected by DEF or by treatments other than added fat. MON tended ($P=0.07$) to decrease methanogenesis, but increased isovalerate. MON did not affect flows of t10, t11, or total t18:1 FA. Protozoa increased BH intermediates possibly by stimulating lipolysis or the first step of BH or by inhibiting the second step of BH by influencing the bacterial community structure by selective predation.

Key Words: Methane, Protozoa, Biohydrogenation

130 Manipulation of fermentation profile and methane production with microbial inhibitors and protozoal retention in continuous culture. S. K. R. Karnati*, J. T. Sylvester, L. E. Gilligan, and J. L. Firkins, *The Ohio State University*, *Columbus*.

Protozoa profoundly impact ruminal carbohydrate and N metabolism. We modified 4 continuous culture vessels to determine interactions between ruminal protozoa, methanogens and eubacteria. The 4 vessels were incubated in 4 periods in a 4 x 4 Latin square design split into 2 sub-periods. In sub-period 1, a multi-stage filter system (50 µm smallest pore size) retained most protozoa so that they passed with the overflow (50 h retention time). At the start of sub-period 2, conventional

filters (300 µm pore size) were used to also remove protozoa via filtrate pumps over 3 d; after further 7 d of adaptation, the fermenters were sampled for 3 d. Throughout, the fermenters were fed 40 g/d of a 30:70 concentrate:forage diet (1 meal) containing either no additive, 4% animal-vegetable fat, bromoethanesulfonate (BES, 250 µM; a methane inhibitor), or monensin (2.5 µM). Protozoal counts were used to calculate generation times (total pool size of cells in the fermenter /flow of cells in the effluent). The model included the fixed effects of period, treatment, and filter, and the random effect of fermenter. Means were compared using protected LSD. Flow of total N and digestibilities of NDF and OM were 18%, 16% and 9% higher, respectively, for the defaunated sub-period but were not different between treatments. Methanogenesis was unaffected by defaunation but tended (P=0.07) to be decreased by monensin. Protozoal counts were not different between treatments, but BES increased the generation time from 43.2 to 55.6 h. Ammonia concentration was 33% higher in the faunated fermenters but not affected by treatment. Defaunation did not affect total VFA production but decreased the acetate: propionate ratio; monensin increased isovalerate production in both sub-periods, but more in faunated. Monensin selects for Gram negative bacteria such as *Megasphaera*, *Fibrobacter*, and *Prevotella*, which can produce isovalerate and might increase deamination of AA from protozoal proteolysis. Because of challenges in defaunation in vivo, our modified system should advance our understanding of protozoal ecology.

Key Words: Methane, Protozoa, Monensin

131 Gastrointestinal metabolism and plasma concentrations of the methane-inhibitor, nitroethane, in fed steers. R. Anderson*[1], N. Ramlachan[1], H. Gutiérrez-Bañuelos[2], G. Carstens[2], W. Majak[3], R. McDiarmid[3], T. Callaway[1], R. Harvey[1], S. Horrocks[1], T. Edrington[1], and D. Nisbet[1], [1]*USDA/ARS, Food & Feed Safety Research Unit*, *College Station, TX*, [2]*Texas A&M University*, *College Station*, [3]*Agriculture & Agri-Food Canada, Kamloops Range Research Unit*, *Kamloops, BC, Canada*.

To investigate the metabolism and absorption of the methane-inhibitor, nitroethane (NE), we fed 18 steers (403±26 kg BW; mean±SD) a 50% concentrate diet and administered 0, 80 or 160 mg NE/kg BW per day (6 steers/treatment) for 14 d. Treatments were administered orally 2X daily. Ruminal fluid and feces were collected on d -1, 1, 2, 7 and 14 of treatment; blood samples were collected at 0 and 6 h and at 1, 2 and 7 d of treatment. Rates of NE degradation (dNE/dt) were determined by in vitro incubation. Concentrations of NE were determined colorimetrically. Mean (±SD) NE concentrations in plasma 6 h after start of NE treatments were 0.12±0.1 and 0.41±0.1 µmol/ml for steers administered 80 or 160 mg NE/kg BW per day, respectively, indicating rapid absorption of NE. Plasma NE concentrations peaked 1 d after initiation of the 80 or 160 mg NE/kg BW per day treatments (0.38±0.1 and 1.14±0.1 µmol/ml, respectively). Plasma NE concentrations declined thereafter to 0.25±0.1 and 0.78±0.3 and to 0.18±0.1 and 0.44±0.3 µmol/ml on days 2 and 7 for the 80 or 160 mg NE/kg BW per day treatment groups, respectively, indicating decreased absorption or more rapid excretion or metabolism of the compound. An analysis of variance revealed that ruminal dNE/dt from steers administered NE were >2.5-fold higher (P<0.05) than the mean (±SD) rate observed in steers administered no NE (0.05±0.1 µmol NE/ml ruminal fluid per h). This observation suggests an enrichment of NE-degrading bacteria in the rumen of both groups of NE-treated steers. Fecal dNE/dt (0.07±0.1 µmol NE/g feces per h) were unaffected (P>0.05) by treatment indicating that NE was not present at high enough concentrations in the lower gut to affect a similar enrichment of NE-degrading bacteria in these steers.

Key Words: Methane, Nitroethane, Rumen

132 Effects of feeding a polyclonal antibody preparation against Streptococcus bovis on rumen fermentation of heifers switched from a high forage to a high concentrate diet. M. Blanch*[1], S. Calsamiglia[1], N. DiLorenzo[2], and A. DiCostanzo[2], [1]*Universitat Autonoma de Barcelona*, *Bellaterra, Spain*, [2]*University of Minnesota*, *St. Paul*.

The effects of feeding a polyclonal antibody preparation against Streptococcus bovis (PAPSb) were studied in a completely randomized experiment using 12 crossbred heifers (452±20 kg BW) with two groups (6 animals each): control (CTR) and polyclonal antibody treatment (PAPSb, CAMAS Inc., MN). The acidosis induction protocol included 3 periods: 3 months of baseline (100% fescue ad libitum), 10 d adaptation (d 1-10 of the experiment, fed 100% forage + 10mL of PAPSb top-dressed in treatment group) and 12 d of challenge feeding (d 11-22 of the experiment). The challenge consisted in increasing the concentrate (16% CP) intake 2.5 kg DM per day until 12.5 kg (achived in 5 days) plus fescue ad libitum. The treatment group received 10 mL of PAPSb daily. Acidosis was declared when pH reached 5.5 or when concentrate intake was reduced more than 50% compared with the previous day. When an animal was considered acidotic it was taken out of the experiment. Samples of ruminal contents were collected at 0h and 6h post feeding to determine pH, and volatile fatty acid and ammonia-N concentrations. Data were analysed using PROC MIXED of SAS (version 8.2). Differences were declared at P<0.05. PAPSb had higher pH values at 0h post feeding in days 16 (6.70 vs 6.11), 18 (6.54 vs 5.95) and 19 (7.26 vs 6.59) compared with CTR. PAPSb had higher concentration of acetic acid at 6h post feeding (81.8 vs 90.3 mM for CTR and PAPSb, respectively) and higher total volatile fatty acid concentration (132.9 vs 147.1 mM for CTR and PAPSb, respectively). These results indicate that PAPSb may be effective in reducing acidosis when heifers are abruptly adapted from a high forage to a high concentrate diet.

Key Words: Streptococcus bovis, Antibody, Rumen fermentation

Graduate Student Paper Competition: ADSA Southern Branch

133 Waste milk supply and pasteurizer performance on three North Carolina dairy farms. M. C. Scott*[1], R. E. James[1], M. L. McGilliard[1], and B. A. Hopkins[2], [1]*Virginia Polytechnic Institute and State University*, *Blacksburg*, [2]*North Carolina State University*, *Raleigh*.

Feeding saleable milk or milk replacer to the pre-weaned calf results in high daily feed cost. All dairy farms generate waste milk (WM) that cannot be sold. Waste milk includes, but is not limited to, transition milk and milk from cows treated with antibiotics. Feeding WM to calves reduced feed cost, but raises bio-security concerns. Pasteurization effectively lessens health risk associated with feeding WM. The objective of this study was to determine amount and composition of WM generated by three dairy farms and to track effectiveness of on-farm high-temperature short-time (HTST) pasteurizers. Bacteriological