T248 Effect of plant extract supplementation on rumen fermentation and metabolism in young Holstein bulls receiving a high-concentrate diet. A. Anglada[1], M. Devant*[1], and A. Bach[1,2], [1]*IRTA, Barcelona, Spain*, [2]*ICREA, Barcelona, Spain.*

Ninety male Holstein bulls were used in a complete randomized design to study the effect of a blend of cynarin, gingsen and fenugreek (Biostar, Phytosynthese, France) supplementation on performance, rumen fermentation, and metabolism of Holstein bulls fed high-concentrate diets. Three treatments : control (CTR), supplementation of 32 mg/kg DM of were tested sodium monensin (MON, positive control), and supplementation of 2.8 g/kg DM of Biostar (BIO) over a 109-d period. Animals were weighed (303 ± 3.6 kg of initial BW) and randomly distributed by BW in 6 pens. Concentrate and straw were both offered *ad libitum*. Animal BW, and group concentrate and straw consumptions were recorded every 3 wks. Rumenocentesis was performed to all bulls starting at 63 d of study at 0900 during 3 consecutive days to determine rumen pH, ammonia N, and VFA concentrations. Blood samples from all bulls were taken starting at 7, 35, and 71 d of study at 0900 during 3 consecutive days to determine cortisol, glucose, insulin, and leptin. Final BW at 109 d of study of MON (463 kg ± 4.1) and BIO (466 kg ± 4.1) bulls was greater ($P < 0.05$) than CTR bulls (452 kg ± 4.1). Neither monensin nor Biostar supplementation affected feed consumption, and feed efficiency. Rumen pH was lower ($P < 0.001$) in MON and BIO treatments than in CTR. Rumen molar proportion of propionic acid increased ($P < 0.05$) in MON and BIO treatment bulls compared to CTR bulls. Bulls supplemented with Biostar had greater ($P < 0.05$) insulin and glucose plasma levels than MON or CTR bulls. Monensin or Biostar supplementation increased ($P < 0.001$) cortisol levels in bulls at 7 and 71 d of study compared to CTR treatment. Serum leptin concentration increased ($P < 0.01$) from 35 to 71 d of study; however, in MON bulls the increase was not as pronounced as in BIO and CTR bulls. In bulls fed a high-concentrate diet Biostar supplementation had similar effects on rumen fermentation to monensin supplementation.

Key Words: Rumen fermentation, Plant extracts, Leptin

T249 Evaluation of tannins on ammonia release of soybean meal protein under in vitro ruminal conditions. H. Carneiro*[1], T. A. Corrêa[2], and J. C. F. Lima[2], [1]*Empresa Brasileira de Pesquisa Agropecuária, Juiz de Fora, MG, Brazil*, [2]*Universidade Federal de Juiz de Fora, Juiz de Fora, MG, Brazil.*

The objective of this experiment was to examine the effects of two types of tannins quebracho (TQ) (Schinopsis spp) and sorghum bicolor (TS) on in vitro degradation of soybean meal. The extent of binding to soybean protein commercial tannin from TQ and TS was evaluated incubating them under in vitro ruminal conditions for 48h. The protein binding activity was estimated measuring changes in ammonia concentration when the tannin was incubated with soybean meal at a proportion of 8% of the dry weight. Soybean meals (0.5g) were weighted in 100 mL plastic tubes and 0.01, 0.02 and 0.04g (2, 4, 8%) of one the tannin sources dissolved in McDougall buffer (5mL) was added. Triplicate tubes were used for each tannin level and for the control (no tannin). Tubes were placed in water bath at 39°C for 12hs to allow tannin and protein to react. Tilley and Terry procedure was used to determine degradation by rumen bacteria and degradation by rumen bacteria plus pepsin. ANOVA analysis was performed and differences among means were tested using Tukey's test. As compared to soybean meal alone (control equal 87% degradation), ammonia concentration decreased by 35% for TC from TQ and 31% for TC from TQ. Ammonia concentration decreased and also in vitro DM degradation with addition of tannins to soybean meal. Crude Protein increased in the residual degradation. Reduction of ammonia per unit of tannin added was higher for TQ than TS ($p<0.05$). Linear regression equation was calculated using ammonia concentration, rumen bacteria DM degradation and rumen bacteria plus pepsin DM degradation as dependent variable. Coefficients for linear relation were higher for commercial tannin R^2 98% than sorghum R^2 78%. The results showed that TQ were more efficient in protecting soybean meal from in vitro degradation by rumen bacteria with the lowest negative effect on in vitro rumen bacteria plus pepsin degradation as compared to TS. Although in vitro results can not be extrapolated to the whole animal, it suggest that CT from TQ could have a beneficial effect in vitro by increasing rumen escape protein but microbial ruminal protein formation could be depressed.

Key Words: Condensed tannin, Sorghum, Ammonia

T250 Effects of nitroethane on methane production and fermentation balance in fed steers. H. Gutiérrez-Bañuelos*[1], L. J. Slay[1], G. E. Carstens[1], N. Ramlachan[2], S. Horrocks[2], T. R. Callaway[2], T. S. Edrington[2], R. C. Anderson[2], and D. J. Nisbet[2], [1]*Texas A&M University, College Station*, [2]*USDA/ARS, Food & Feed Safety Research Unit, College Station, TX.*

Objectives of this study were to examine the effects of a methane-inhibitor (nitroethane; NE) on methane (CH_4) emissions, and ruminal CH_4-producing activity in Holstein steers (403 ± 26 kg BW). Steers were fed a 50% concentrate diet and orally administered NE twice daily at 0 (0X), 80 (1X) or 160 (2X) mg NE/kg BW d^{-1} for 14 d. Methane emissions were measured for 22 h/d on d 0, 6 and 13 of the study, using the sulfur hexafluoride tracer gas technique. Ruminal and fecal contents were collected on d -1, 1, 2, 7 and 14 of treatment for measurement of VFA and CH_4 -producing activity. Compared to control steers (14.6; 1.24 kg/d), DMI and ADG were higher ($P<0.01$) in 1X-treated steers (15.0; 1.49 kg/d), but lower ($P<0.01$) in 2X treated steers (13.1; 0.86 kg/d). Methane emissions (L/d) decreased ($P<0.07$) as NE dose increased (283, 270 and 246 ± 11 for 0X, 1X and 2X steers, respectively). Methane emissions per unit gross energy intake (% GEI) were also lower ($P<0.03$) in 1X-(3.76 ± 0.14%) compared to control steers (4.22 ± 0.14 %). However, lower DMI of 2X-treated steers resulted in similar CH_4 emissions between 2X- (4.15 ± 0.14%) and control steers. Methane emissions were not affected by day of study or day x treatment. Ruminal CH_4 producing activity (8.5, 7.9 and 4.7 ± 0.5 umol/g h^{-1}) and calculated ruminal CH_4 based on fermentation balance (23.1, 23.1 and 19.1 ± 1.3 mol CH_4 /100 mol VFA) were lower ($P<0.01$) in 2X- compared to 0X- and 1X-treated steers. Fecal CH_4 producing activity was lower in 1X- and 2X-treated steers compared to 0X-steers (3.9, 1.4 and 1.4 ± 0.4 umol/g h^{-1}). Day of study affected ruminal CH_4 activity, but day x treatment was not significant. Results from both in vivo and in vitro measurements of CH_4 production suggest that NE inhibits methanogenesis in steers for up to 14 d.

Key Words: Methane, Nitroethane, Rumen

T251 Effects of hop acids. I. *In vitro* ruminal fermentation. M. A. Schmidt and M. L. Nelson*, *Washington State University, Pullman.*

Two randomized complete block *in vitro* experiments were conducted to 1) determine if hop (*Humulus lupulus* L.) beta acids altered ruminal fermentation in vitro and, 2) determine if five other hop acids altered ruminal fermentation similar to monensin. Experiment 1 had treatments