

**1638 (M352) Metabolic characteristics of grazing Nellore bulls receiving concentrated supplementation with additives.** J. A. C. Lima<sup>1,2</sup>, H. J. Fernandes<sup>2</sup>, E. P. Rosa<sup>2</sup>, L. S. Caramalac<sup>2</sup>, K. A. Silveira<sup>2</sup>, G. C. Silva<sup>2</sup>, B. D. D'auria<sup>2</sup>, and A. Aguiar<sup>3</sup>, <sup>1</sup>Federal University of Viçosa, Brazil, <sup>2</sup>State University of Mato Grosso do Sul, Aquidauana, Brazil, <sup>3</sup>University of Florida, Gainesville.

The objective of this study was to evaluate the effect of a commercial concentrate supplement with additives in the metabolic characteristics of grazing bulls, during the dry/rainy transition season in Aquidauana-MS, Brazil. Twelve Nellore bulls (initial body weight of 370 ± 15 kg) were randomly assigned to twelve *Brachiaria decumbens* Stapf pastures (1.0-ha/pasture; one bull/pasture) on a completely randomized design. Treatments were: 1) concentrate supplement Lipomax with homeopathic additives (Convert H, Sodo 100, Figotonus) and Virginiamicina (Lipomax treatment), and 2) concentrate supplement with a similar protein content (18% CP), and without additives (Control treatment). Animals were feed daily at rate of 0.5% of the animal's body weight. After 53 d, when the animals achieved body weight of 426 ± 27.3 kg, urine "spot" and blood samples of the animals were collected, 4 h after the concentrate supplement was offered. Urine samples were analyzed for creatinine (for daily urine total production estimative), N-urea and total-N, and blood samples for serum urea. A significance level of 5% was adopted. Serum urea, and urine N-urea and total-N excretion of the grazing animals showed no difference ( $P > 0.05$ ) when the additives were used in the concentrate supplementation (Table 1638). The low levels of these metabolic parameters for grazing animals indicated an efficient use of the diet metabolizable protein, and the use of additives could not increase this efficiency.

**Key Words:** grazing bulls, protein metabolism, tropical environment

**Table 1638.** Parameters of protein metabolism of Nellore bulls grazing brachiaria grass and receiving concentrated supplement with or without additives

Item	Treatments		CV (%)	P-value
	Control	Lipomax		
URbl <sup>1</sup> (mg/dl)	15.1	14.7	10.3	0.690
Nururine <sup>2</sup> (g/d)	35.9	33.0	28.6	0.622
Ntotur <sup>3</sup> (g/d)	45.9	55.1	24.8	0.231

<sup>1</sup>URbl is the blood urea, mg/dl.

<sup>2</sup>Nururine is the N-urea in urine, g/d.

<sup>3</sup>Ntotur is the N total in urine, g/d.

**1639 (M353) Productive parameters, metabolic and economic viability of dairy cows supplemented with different levels of urea in diets based on sugarcane.** R. C. D. Souza<sup>1</sup>, R. B. Reis<sup>2</sup>, F. C. F. Lopes<sup>3</sup>, J. M. Leão<sup>2</sup>, and M. H. F. Mourthé<sup>4</sup>, <sup>1</sup>PUC Minas, Betim, Brazil, <sup>2</sup>UFMG, Belo Horizonte, Brazil, <sup>3</sup>Embrapa Gado de Leite, Juiz de Fora, Brazil, <sup>4</sup>Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, Brazil.

Sugarcane has been recommended for dairy farms that utilize low-yielding cows, used in to feeding regimes that do not seek to obtain high lactating performance per animal. The utilization of sugarcane and other feedstuffs, should be based on dietary formulations that incorporate nutritional-model recommendations of practical use (NRC, 2001). Sugarcane was also considered adequate for dairy cattle producing 20 kg of milk per day. The sugarcane yield support potential, in balanced diets, must be defined more precisely to allow recommendations to be specifically targeted. No scientific data exist to support the use of sugarcane in diets formulated for high-performance lactating animals. Sugarcane has been used for animals of higher production due to its qualities, among them, the low cost of dry matter. However, the appropriate level of urea in to add to cane sugar diets feed to high production animal is still questionable. The objective of this study was to evaluate feed intake, nutrient digestibility, feed efficiency, production and milk composition, metabolic parameters and the economic viability of lactating cows fed diets based on sugarcane supplemented with increasing levels of urea: sulfate on dry matter basis (0, 0.5 and 1.0%). Twelve multiparous cows and six primiparous Holstein and Holstein x Gir, with 83 + 7 d of lactation, average milk yield of 21.3 ± 0.8 kg/d, average body weight of 580 + 18.3 kg, fed with total mixed ration 50:50, assigned to reversion assay type switch-back, 3 × 3. Cows fed the diet with 1.0% urea had lower ( $P < 0.05$ ) dry matter intake (DMI) and organic matter intake (OMI), but feed efficiency higher on this diet. DMI, OMI and feed efficiency was 19.64, 19.66 and 18.33 kg/d, 18.24, 18.31 and 17.03 kg/d and 1.14, 1.17 and 1.71 kg/kg, respectively for diets containing 0.0, 0.5, and 1.0% of urea. There was no effect of diet

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on nutrient digestibility, milk yield, milk composition and on plasma concentration of urea, glucose and insulin ( $P > 0.05$ ). All diets had a positive balance if considered only cost with food, however the 1% urea diet showed the best outcome per cow. For dairy cows, with an average milk yield of 22 kg/d, sugarcane supplemented with 1% urea in green matter basis despite decreasing the dry matter intake, may be used, without causing any adverse effect on production and metabolic and improve parameters of cost.

**Key Words:** sugarcane, urea, productive parameters.

**1640 (M354) Chia seed supplementation increases ruminal propionate concentration in alfalfa hay based diets evaluated in a dual-flow continuous culture system.** J. Bunkers\*, E. Marostegan de Paula, L. Galoro da Silva, T. Shenkoru, Y. L. Yeh, B. Amorati, D. Holcombe, and A. Faciola, *University of Nevada, Reno.*

Chia seed (CS) and flaxseed (FS) are rich in omega-3 fatty acids which may provide health benefits when added to animals' diets. However, data on the effects of CS supplementation on ruminal metabolism is scarce. The objective of this experiment was to determine nutrient digestibility, rumen fermentation characteristics, microbial protein synthesis, and long-chain fatty acids flow of supplemented alfalfa hay (AH) diet with either CS or FS. Diets were randomly assigned to six dual-flow continuous culture fermenters (1200 to 1250 mL) in a replicated 3 × 3 Latin square arrangement with three 10-d experimental periods consisted of 7 d for diet adaptation and 3 d for sample collection. Fermenters were fed a total of 72 g of DM/d equally divided in four portions. Diets consisted of (DM basis) 95% AH supplemented with: 5% Megalac (Diet A), 5% FS (Diet B), and 5% CS (Diet C). Liquid and solid dilution rates were adjusted daily to 10%/h and 5%/h, respectively. A sample of 500mL from each fermenter was taken on d 8, 9, and 10. Two subsamples of 10 mL were filtered through two layers of cheesecloth, were preserved with 0.2mL of 50% sulfuric acid and centrifuged for ruminal NH<sub>3</sub> and VFA analysis. Statistical analyses were performed using the GLM procedure in SAS. Ruminal metabolism data are presented in the table. Supplementing CS increased the molar proportion of propionate and decreased Acetate:Propionate ratio. There were no differences among treatments for ruminal NH<sub>3</sub> concentration, total VFA concentration, and molar proportions of acetate, butyrate, and branched-chain VFA. Results from this experiment indicate that CS supplementation may change ruminal metabolism by increasing ruminal propionate concentration which may be energetically beneficial for glucose synthesis in ruminants.

**Key Words:** dual-flow continuous culture, chia seed,

flaxseed

	Diet Composition %DM			SEM	P-Value
	Megalac	Flaxseed	Chia seed		
EE	5.6	5.6	5.6		
CP	18.5	19.2	19.4		
804 NDF	40.9	41.7	42.5		
NH <sub>3</sub> -N, mg/dL	5.34	5.38	6.34	0.58	0.46
Total VFA, mmol	125.61	119.12	116.41	5.02	0.48

**1641 (M355) Analysis of rumen motility patterns using a wireless telemetry system to characterize bovine reticulorumenal contractions.** A. M. Egert<sup>1</sup>,

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The objective of this study was to characterize rumen motility patterns of cattle fed once daily. Eight ruminally-cannulated Holstein steers (BW = 321 ± 11 kg) were fed alfalfa cubes once daily at 1.5 × NE<sub>m</sub> top-dressed with a TM-salt pre-mix. Three 24-h collection periods were conducted and each commenced immediately following feeding. A wireless telemetry system (emkaPACK4G telemetry system, emka TECHNOLOGIES USA, Falls Church, VA) was used to monitor real-time pressure changes in the rumen. Pressure transducers and transmitters were housed in a plastic container with screw-on lid that served as the cannula cap. A weighted (300 g), water-filled (1 L), balloon-tipped catheter was connected to the transducer through an adaptor and placed below the mat in the ventral sac of the rumen. Data were recorded and stored using iox2 software (iox 2.9.4.27, emka TECHNOLOGIES USA) which utilized a rhythmic analyzer to analyze the raw rumen pressure data, identify ruminal contractions, and calculate the following parameters for each contraction: baseline pressure, peak pressure, amplitude, frequency, time to peak, relaxation time, duration, and area under the curve. Mean results were calculated for each parameter (Table 1641). All parameters were affected ( $P < 0.0001$ ) by animal and hour. Baseline and peak pressure of contractions increased through 14 h post-feeding, which may have been due to animals laying down more often. Amplitude of ruminal contractions was greatest the first 5 h post-feeding and then decreased quickly. Frequency, duration, and area decreased throughout the collection period, but increased shortly before the next feeding. Mean water intakes for the first and second 12 h post-feeding were 35.5 ± 2.19 L and 0.92 ± 0.26 L, respectively. These data demonstrate that wireless telemetry can be used to non-invasively monitor rumen motility patterns in freely moving steers. Feeding management impacts the values obtained and must be considered when designing experiments.

**Key Words:** forestomach, motility, rumen pressure

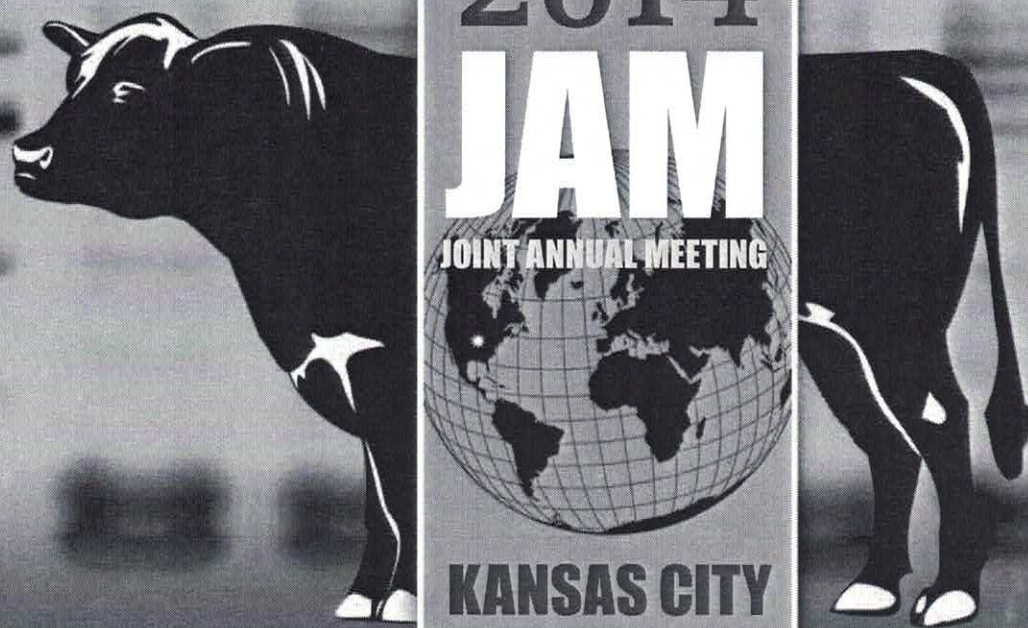
**Table 1641.** Means values and range between animals for rumen contraction variables measured

Item, units	Mean <sup>1</sup>	SEM <sup>2</sup>	Range <sup>3</sup>
Baseline, mmHg	22.99	2.35	8.35
Peak, mmHg	30.28	2.47	8.26
Amplitude, mmHg	7.29	0.40	1.04
Frequency, contractions/min	2.87	0.17	0.83
Time to peak, s	4.06	0.33	1.18
Relaxation time, s	5.22	0.47	1.14
Duration, s	9.28	0.62	1.74
Area, mmHg*s	30.41	2.43	6.35

<sup>1</sup> Mean = overall mean

<sup>2</sup> SEM = standard error of the mean, n = 8

<sup>3</sup> Range = range of means between the 8 animals



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