749 Rumensin in dairy cows diets containing high and low levels of linoleic acid from corn distillers grains and high and low fractions of physically effective fiber. M. L. Smith*[1], K. F. Kalscheur[1], J. L. Anderson[1], D. P. Casper[1], and D. L. Prentice[2], *[1]South Dakota State University, Brookings, [2]Elanco Animal Health, Greenfield, IN.*

The objective of this study was to determine production responses of dairy cows fed diets containing low (LoLA) or high (HiLA) concentrations of linoleic acid from dried distillers grains and low (Lpef) or high (Hpef) physically effective fiber from alfalfa (chopped hay or pellets made from the same lot of hay) with or without the addition of Rumensin (Rum) in the diet. Sixty-four lactating Holstein dairy cows (65-250 DIM) were used in a 12-wk randomized complete block design consisting of a Covariate Period (wk 1-3), Period 1 (wk 4-7), and Period 2 (wk 8-12). During the Covariate Period, all cows received a common diet. Cows were blocked according to parity, milk yield, and DIM, and were randomly assigned to one of four diets in a 2×2 factorial arrangement of treatments: (1) LoLA-Hpef; (2) LoLA-Lpef; (3) HiLA-Hpef; and (4) HiLA-Lpef. In Period 2, half of the cows on each diet in Period 1 were randomly assigned to be fed Rum resulting in a 2 × 2 × 2 factorial arrangement of treatments. Diets in Period 2 containing Rum were formulated to contain 22 g/ton. Diets were formulated for a 50:50 forage to concentrate ratio. Average DMI was not affected by diet in either Period 1 or 2. Milk yield was not affected by diet in Period 1, but in Period 2 cows fed LoLA tended to produce less than cows fed HiLA (34.33 vs. 36.34 kg/d; $P = 0.09$). In Period 1, cows fed LoLA vs. HiLA had greater fat % (3.70 vs. 3.35%; $P = 0.01$) and yield (1.32 vs. 1.21 kg/d; $P = 0.05$), respectively. FCM FE was greater for cows fed LoLA compared to HiLA (1.33 vs. 1.24; $P = 0.04$). In Period 2, cows fed LoLA vs. HiLA had greater fat % (3.80 vs. 3.23%; $P = 0.001$) and yield (1.28 vs. 1.17 kg/d; $P = 0.07$). In addition, cows fed Hpef vs. Lpef had greater fat % (3.76 vs. 3.27%; P=0.003) and yield (1.30 vs. 1.15 kg/d; $P = 0.01$). Cows fed Hpef vs. Lpef tended to have greater FCM FE (1.29 vs. 1.19; $P = 0.09$). The addition of Rum had no effect on intake, milk yield or milk composition with the exception of a lower lactose %. No interactions of main effects ($P > 0.05$) occurred during the study.

Key Words: physically effective fiber, linoleic acid, Rumensin

750 Effect of *Saccharomyces cerevisiae* CNCM I-1077 (Levucell SC) on rumen pH and milk production during heat stress. M. Fustini[1], A. Palmonari[1], H. Durand[2], A. Formigoni[1], and E. Grilli*[1], *[1]DIMEVET, University of Bologna, Ozzano Emilia, BO, Italy, [2]Lallemand Animal Nutrition, Blagnac, France.*

The aim of the study was to evaluate the effect of a live yeast (*Saccharomyces cerevisiae* CNCM I-1077, Levucell SC) on milk production and rumen pH of high-producing dairy cows challenged with a highly acidogenic diet during summer (temperature humidity index >68). Forty Holstein dairy cows were divided in 2 groups homogeneous for milk yield, milk fat and proteins, DIM, and parity. Twelve cows per group were then randomly selected and given a bolus with a continuous monitor indwelling pH meter. After 7 d adaptation during which cows were fed a basal TMR (57:43 concentrate:forage ratio), the treated group was given 2×10^{10} cfu *S. cerevisiae*/head/day through a premix in the TMR for 42 d. Individual daily milk production was monitored through Afilab and 5 milk samples per group were also collected at d 0, 9, 21, 27, and 40 of the study to perform chemical analyses. At 0, 21, and 42 d blood samples were collected to perform biochemistry and hematological analyses. Milk yield and quality, and blood data and mean daily pH were analyzed with ANOVA repeated measures, whereas ruminal pH fluctuation were grouped in discrete intervals (minutes/day at pH <5.8) and analyzed with a t-student test. Cows fed with *S. cerevisiae* had a numerically higher milk yield (+1.2 kg over an average of 34 kg/head/d at 180 DIM; $P = 0.2$) and a higher fat content than control cows (+3.6%; $P < 0.05$). As a result, the treated group resulted in a higher fat-corrected milk yield (+1.7 kg/head/day, $P < 0.05$) whereas protein and lactose contents were not affected. Moreover, treated animals had a longer interval of time during which the rumen pH remained above the critical value of 5.8 (+48 min/day; $P < 0.05$), while the average daily pH was unaffected. Blood parameters were not affected by the treatment. The results suggest that while the cows maintained a general good health status despite the stressful environment, *S. cerevisiae* CNCM I-1077 had the potential to prevent the development of rumen sub-acidosis, by probably improving fiber utilization, in cows that must be fed high energy diets to maintain highly efficient performance.

Key Words: dairy cow, rumen pH, *S. cerevisiae*

751 Production responses to increasing MP lysine supply in lactating Holstein cows. A. M. Schuler*[1], K. F. Kalscheur[1], F. Diaz-Royon[1], S. E. Boucher[2], and F. R. Valdez[2], *[1]South Dakota State University, Brookings, [2]Kemin Industries Inc., Des Moines, IA.*

The objective of this research was to determine production responses of high-producing dairy cows fed increasing concentrations of rumen-protected (RP) Lysine (Lys) (LysiPEARL; Kemin Industries Inc., Des Moines, IA) while maintaining a constant supply (g/d) of metabolizable protein (MP) and methionine (Met). Twelve multiparous and 4 primiparous Holstein cows were used in a 4 × 4 Latin square design with 3-wk periods. Four dietary treatments were formulated based on predicted MP Lys supply: (1) Negative control (NC) formulated to supply 186.3 g of MP Lys without the addition of Lys; (2) Positive Control using blood meal (PCBM)to supply 205.3 g of MP Lys; (3) Ruminally protected Met and Lys (RPML) using LysiPEARL (0.32%) to supply 205.2 g of MP Lys; (4) High Lys (Lys25) formulated to supply 229.8 g of MP Lys using LysiPEARL (0.74%). Diets were formulated to be similar in MP Met supply using rumen-protected Met (MetiPEARL). Basal diets contained 40.8% corn silage, 13.0% alfalfa hay, and 46.2% concentrate mix. Dry matter intake (DMI) was not affected by increasing MP Lys supply ($P > 0.05$). Cows responded to increasing MP Lys linearly for protein yield, energy corrected milk (ECM), and ECM feed efficiency (ECMFE) and in quadratic fashion for protein and total solids (TS) % ($P < 0.05$). Linear trends were observed for yields of milk, fat, and TS. Quadratic trends ($P < 0.10$) were observed for fat % and MUN ($P < 0.10$). Cows fed BM tended to increase in DMI compared with cows fed RPML ($P < 0.10$). Overall, cows increased milk protein yield and ECMFE when balancing rations for MP Lys using LysiPEARL.

Table 1.

Item	Treatment				SEM	*P*-value[1]
	NC	PCBM	RPML	Lys25		
DMI, kg/d	24.7	24.7	23.7	24.1	0.80	BT
Milk, kg/d	36.2	37.6	36.6	37.7	0.95	LT
Fat, %	3.96	3.84	3.86	3.92	0.107	QT
Protein, %	3.19	3.13	3.17	3.20	0.065	Q
TS, %	12.9	12.7	12.8	12.9	0.17	Q
MUN, mg/dL	13.1	12.5	12.7	13.0	0.29	QT
Fat, kg/d	1.42	1.44	1.39	1.47	0.043	LT
Protein, kg/d	1.15	1.18	1.15	1.20	0.033	L
TS, kg/d	4.66	4.78	4.66	4.84	0.120	LT
ECM	38.4	39.4	38.3	40.0	0.96	L
ECMFE	1.57	1.61	1.63	1.67	0.045	L

[1]L = linear response ($P < 0.05$); Q = quadratic response ($P < 0.05$); BT = trend for blood meal vs. RPML ($P < 0.10$); LT = linear trend ($P < 0.10$); QT = quadratic trend ($P < 0.10$).

Key Words: dairy cow, rumen-protected Lys

752 Feed intake, ruminal fill and pH of calcium oxide pretreated corn stover diets fed to lactating cows. D. E. Cook*[1], M. J. Cecava[2], P. H. Doane[2], M. B. Hall[3], and D. K. Combs[1], *[1]University of Wisconsin-Madison, Madison, [2]ADM Research, Decatur, IL, [3]USDA-ARS, US Dairy Forage Research Center, Madison, WI.*

Corn stover was pretreated with calcium oxide (50 g CaO kg^{-1} stover DM in 500 g H_2O kg^{-1} stover DM) at ambient conditions and fed to 8 ruminally cannulated Holstein dairy cows in a 4 × 4 Latin square design with 21-d periods. The treatments were 0, 40, 80, and 120 g stover DM kg^{-1} TMR DM, with treated stover replacing corn grain on a DM basis. Rumen sampling occurred on d 15, fecal sampling for pH on d 17, and rumen evacuations 2 h postfeeding on d 21. Ruminal pH was measured hourly from the time of feeding to 6 h postfeeding. Cows were 108 ± 58 DIM and produced 34.4 ± 2.1 kg milk d^{-1} on 23.6 ± 0.6 kg DMI. DMI decreased ($P < 0.01$) linearly with increasing levels of stover inclusion, from 25.3 to 21.9 kg DM d^{-1} (1.1 kg SE). Ruminal pH nadir and fecal pH increased linearly ($P < 0.05$) with stover inclusion level (Table 1). Rumen DM turnover rate (DMI·rumen digesta DM^{-1}) decreased linearly ($P < 0.01$) with stover inclusion. Rumen digesta measures were 93.1 kg wet matter, 14.3 kg DM, 12.5 kg OM, and 7.4 kg NDF, with no difference among treatments ($P > 0.2$). DMI was likely limited by stover inclusion because rumen digesta mass did not change, but the rumen DM retention time increased.

Table 1.

	Stover inclusion (g stover DM kg^{-1} TMR DM)				SEM
	0	40	80	120	
Rumen pH (nadir)	5.83	5.83	5.93	5.94	0.07
Fecal pH	6.33	6.39	6.45	6.47	0.05
Rumen DM turnover rate	1.86	1.65	1.62	1.51	0.06

Key Words: calcium oxide, stover, treated stover

753 Determining the optimal level of zinc amino acid complex in lactating dairy cows. A. Nayeri*[1], N. C. Upah[1], E. Sucu[1,2], M. V. Sanz-Fernandez[1], J. M. DeFrain[3], and L. H. Baumgard[1], *[1]Iowa State University, Ames, [2]Uludag University, Bursa, Turkey, [3]Zinpro Corporation, Eden Prairie, MN.*

Multiparous (n = 79) and primiparous (n = 68) Holstein cows were blocked by parity and previous 305 ME milk yield, and assigned to one of 3 dietary treatments: (1) 75 mg/kg DM supplemental Zn as $ZnSO_4$ (Control), (2) Control except 33 mg Zn/kg in the close up and 16 mg Zn/kg in the lactation diet from $ZnSO_4$ were replaced by Zn amino acid complex (Availa-Zn, Zinpro Corporation; 16 Availa-Zn), and (3) Control except 67 mg Zn/kg in the close up and 40 mg Zn/kg in the lactation diet from $ZnSO_4$ were replaced by Availa-Zn (40 Availa-Zn). Supplemental Mn, Cu, Co, Se and I levels and sources were the same among all treatments. Cows were housed at the ISU Dairy farm and individually fed a TMR containing dietary treatments beginning 28 ± 15 d before expected calving date and continued until 250 DIM. Relative to Control, multiparous cows (but not heifers) fed 16 Availa-Zn or 40 Availa-Zn had increased (20%) colostrum IgG. Prepartum DMI decreased with Availa-Zn supplementation ($P \leq 0.05$) and tended to decrease quadratically with increasing Availa-Zn level ($P \leq 0.15$), being lower for cows fed 16 Availa-Zn. Postpartum DMI decreased in cows fed Availa-Zn ($P < 0.05$) and decreased with increasing Availa-Zn level (Linear and Quadratic, $P \leq 0.05$), while milk yield (MY) increased (Linear and Quadratic, $P \leq 0.05$) with increasing Availa-Zn supplementation. Feeding Availa-Zn improved feed efficiency linearly ($P \leq 0.01$) when measured as MY/DMI, 3.5% fat-corrected MY/DMI and solids-corrected MY/DMI. Feeding a higher Availa-Zn level resulted in a linear decrease in services per conception (3.1, 2.0 and 2.6 for Control, 16 Availa-Zn and 40 Availa-Zn, respectively; $P \leq 0.10$). Feeding Availa-Zn decreased milk fat, lactose and total solids content ($P \leq 0.10$) and increased MUN ($P \leq 0.01$). Milk LnSCC tended to decrease with increasing Availa-Zn level (Linear; $P \leq 0.15$). Effects of treatment on plasma metabolites were minimal although Availa-Zn tended ($P \leq 0.05$) to increase NEFA concentration. Feeding increasing Availa-Zn levels improves fertility and increases production efficiency by reducing feed intake without affecting overall milk energy output.

Key Words: zinc, lactation

754 Temporal effect of feeding potassium carbonate sesquihydrate on milk fat. G. Ma*[1], J. H. Harrison[1], E. Block[2], T. C. Jenkins[3], and T. D. Nennich[4], *[1]Washington State University, Puyallup, [2]Church and Dwight Animal Nutrition, Princeton, NJ, [3]Clemson University, Clemson, SC, [4]Purdue University, Lafayette, IN.*

Our research team has previously demonstrated that supplementation of potassium carbonate sesquihydrate supplementation can increase milk fat test and is suggested to be in part mediated as a result of changing the biohydrogenation pathways in the rumen (J. Dairy Sci. 95:3919–3925). Previous experimental design has only allowed us to determine that potassium carbonate sesquihydrate supplementation can increase milk fat after a week of feeding. In this study, 10 multiparous dairy cows in early lactation were used to evaluate how quickly milk fat % would change when cows were supplemented with potassium carbonate sesquihydrate. Cows were fed individually via Calan headgates. In period 1, cows were fed a diet formulated to contain a DCAD of 288 mEq/kg of DM (1.48% K of total DM), 5.7% long-chain fatty acids (LCFA) (%DM), and 0.40 kg/d SBM oil for a 7 d adaptation and covariate period. In period 2, d 8 to 28, 5 cows remained on the same diet (Control) and 5 cows were switched abruptly to a diet containing potassium carbonate sesquihydrate to provide a DCAD of 431 mEq/kg of DM (2.05% K of total DM) with added SBM oil. A daily AM-PM composite of milk was obtained for each cow and analyzed for composition. Milk data were analyzed using Proc Mixed of SAS using a model that included treatment,

day, treatment × day. Milk fat from period 1 was used as a covariate. In period 1, milk fat % was 4.01 and 4.23 for cows that subsequently were on high versus low K, respectively. In period 2, addition of potassium carbonate sesquihydrate had no significant effect on milk production. There was an immediate (within 48 h) and significant increase ($P < 0.01$) in milk fat % for cows fed potassium carbonate sesquihydrate as compared with the control diet, milk fat of 4.28 and 4.06 (high versus low K, respectively) in period 2. In cows with normal milk fat test, the abrupt addition of potassium carbonate sesquihydrate was effective in immediately increasing milk fat %.

Key Words: dairy cow, milk fat, potassium carbonate sesquihydrate

755 Effects of supplemental amino acids and chromium propionate on plasma amino acids, energy digestibility, and productivity of peak lactation dairy cattle. C. F. Vargas*, K. Yuan, C. Titgemeyer, L. K. Mamedova, and B. J. Bradford, *Kansas State University, Manhattan.*

Chromium (Cr) feeding in early lactation increased peak milk production in some studies, but feeding Cr during peak lactation has not been studied. Furthermore, interactions of AA and Cr have not been evaluated. Our objective was to evaluate responses to CrPr (KemTRACE brand chromium propionate 0.04%, Kemin Industries Inc.), rumen-protected Lys (LysiPEARL, Kemin Industries Inc.) and Met (MetiPEARL, Kemin Industries Inc.), and their interaction in peak lactation cows. Forty-eight individually fed Holstein cows (21 primiparous, 27 multiparous, 38 ± 15 DIM) were stratified by calving date in 12 blocks and randomly assigned to 1 of 4 treatments within block. Treatments were control, CrPr (8 mg/d Cr), RPLM (10 g/d Lys and 5 g/d Met, intestinally available), or CrPr plus RPLM. Treatments were premixed with ground corn and top-dressed at 200 g/d for 35 d. Diets included corn silage, alfalfa hay, and concentrates, providing approximately 17% CP, 31% NDF, and 40% NFC. Data were analyzed as a complete block design with a factorial arrangement of treatments and week as a repeated measure using ProcMIXED in SAS. Intake (21.8 ± 4.7 kg/d) and milk yield (43.0 ± 7.0 kg/d) were not affected ($P > 0.10$) by treatments or interactions. Protein content was decreased by RPLM (2.64 vs. 2.72 ± 0.041%, $P = 0.05$) versus control, but protein yield was not altered. A CrPr by week interaction ($P < 0.05$) was detected for lactose content, which was increased by CrPr during wk 1 only (4.99 vs. 4.88 ± 0.036%) versus control. Total AA concentration in blood on d 35 tended to be decreased by RPLM (2.27 vs. 2.44 ± 0.098 m*M*, $P = 0.06$). As a proportion of total AA, only threonine was affected by treatment ($P < 0.05$), with a lower proportion for RPLM. Digestible energy intake and gross energy digestibility, measured by bomb calorimetry, were not affected ($P > 0.10$) by treatments. There were no treatment effects on feed efficiency, and change in body weight or body condition score ($P > 0.10$). In summary, feeding CrPr, RPLM, or both to dairy cows for 5 wk near peak lactation had few effects on energetics or production outcomes.

Key Words: lysine, methionine, chromium

756 Effects of feed additives during a starch and fructose challenge. H. M. Golder*[1,2], A. R. Rabiee[1,2], P. Celi[2,3], and I. J. Lean[1,2], *[1]SBScibus, Camden, New South Wales, Australia, [2]University of Sydney, Faculty of Veterinary Science, Camden, New South Wales, Australia, [3]Melbourne School of Land and Environment, The University of Melbourne, Parkville, Victoria, Australia.*

We hypothesized that feed additive(s) would reduce acidosis risk during a non-life threatening but substantial challenge with starch and fructose. Holstein heifers (n = 40) were allocated to 5 groups: (1) control (no additives); (2) virginiamycin (10 g/hd/d:VM); (3) monensin (2.2 g/hd/d) + tylosin (0.44 g/hd/d:MT); (4) monensin (2.5 g/hd/d) + yeast (Levucell SC Direct 25 g/hd/d:MY); (5) sodium bicarbonate (200 g/hd/d) + magnesium oxide (30 g/hd/d:BUF). Heifers were fed twice daily 62% forage 38% concentrate TMR at 1.25% of BW DM/d for a 20-d adaptation period with their additive(s). Fructose (0.1% of BW/d) was in the ration for the last 10 d of adaptation. On d-21 heifers were challenged with a 1.0% of BW DM wheat and 0.2% of BW fructose ration plus their additive(s). Ruminal samples were collected using stomach tube 5 times over 4 h after consumption of the challenge ration. Data were analyzed using a linear mixed model. There was a large amount of within and between group variation in response to challenge. Clinical acidosis occurred in 1 control heifer. VM and BUF maintained consistently high DMI over the 20-d adaptation ($P < 0.01$). Acetate concentration increased in the BUF and control groups. Butyrate concentration was lower in the MY and MT groups compared with other groups. The VM and BUF, and MY, VM, and BUF groups had the numerically lowest valerate and lactate concentrations, respectively. Ammonia concentration was lowest in the MY group. Mean total lactate was >10 mM for each group throughout challenge sampling. Rumen pH, propionate and total lactate were not influenced by feed additives on challenge day (Table 1). Despite large animal variation VM and BUF had DMI and rumen profiles indicating reduced acidosis risk.

Table 1. Effects and predicted means (±SEM).

	Group						*P*-value[1]	
Item	Control	VM	MT	MY	BUF	SEM	Group (G)	Time (T)
Acetate, mM	67.3^{b}	59.6^{a}	58.8^{a}	60.7^{a}	75.1^{c}	3.0	<0.01	<0.01
Propionate, mM	24.3	19.3	24.6	24.9	22.5	2.3	0.34	<0.01
Butyrate, mM	20.6^{bc}	23.8^{c}	15.9^{a}	15.3^{a}	19.9^{b}	1.9	0.02	0.03
Valerate, mM	2.1^{ab}	1.5^{a}	3.0^{b}	2.7^{b}	1.5^{a}	0.6	0.04	<0.01
Total lactate, mM	34.4	21.6	37.5	19.5	21.0	9.3	0.53	0.64
Ammonia, mM	4.3^{d}	3.6^{cd}	1.4^{ab}	0.6^{a}	2.4^{bc}	0.6	<0.01	0.04
Histamine, ng/mL	151^{bc}	210^{d}	116^{b}	47^{a}	173^{cd}	26	<0.01	0.90
pH	5.7	6.1	5.8	6.1	6.1	0.1	0.16	<0.01

[1]G × T was NS.

Key Words: acidosis, feed additive

757 Effects of addition of *Aspergillus oryzae* culture and 2-hydroxyl-4-methylthio butanoic acid on milk production and rumen fermentation in lactation dairy cows. H. Sun[1], Y. M. Wang*[2], K. J. Zhu[1], Y. B. Zhou[1], B. C. Zheng[1], C. Wang[3], Y. M. Wu[1], and J. X. Liu[1], *[1]Institute of Dairy Science, Zhejiang University, Hangzhou, China, [2]Novus International Trading (Shanghai) Co. Ltd., Shanghai, China, [3]Zhejiang A&F University, Hangzhou, China.*

The objective of the study was to evaluate the effects of *Aspergillus oryzae* culture (AOC) and 2-hydroxy-4-methylthio butanoic acid (HMB) on lactation performance and rumen fermentation in dairy cows. Sixty-four mid-lactation Holstein dairy cows (136 ± 5.0 DIM) were randomly allocated to 4 dietary treatments in a 2 × 2 factorial design: control diet, control diet top-dressed AOC at 5 g/d, control diet top-dressed HMB at 25 g/d, control diet top-dressed AOC at 5 g/d and HMB at 25 g/d. The experiment lasted 8 weeks including 2 weeks for adaptation. Data were analyzed using PROC MIXED of SAS with AOC and HMB as the main factors. Dry matter intake was not significantly affected by AOC or HMB supplementation ($P > 0.05$), while 3.5% FCM tended to increase by HMB ($P = 0.08$). Supplementation of HMB tended to increase the

contents of milk protein ($P = 0.05$) and milk fat ($P = 0.09$), while no significant effect of AOC was found for milk protein and milk fat. Either AOC or HMB supplementation significantly increased concentrations of rumen microbial protein and total volatile fatty acids ($P < 0.01$). However, AOC did not affect the VFA profile, while HMB significantly increased the molar proportion of acetate at the expense of propionate ($P < 0.01$). Both AOC and HMB significantly increased the populations of rumen *Fibrobacter succinogenes*, *Ruminococcus flavefaciens*, and fungi relative to total bacterial 16S rDNA ($P < 0.01$) without changing the protozoa and *R. albus*. It is inferred that addition of AOC and HMB can improve rumen microbial protein and volatile fatty acids by stimulating rumen microbes, resulting in numerical improvement in milk yield. Addition of HMB tended to increases milk fat and milk protein.

Key Words: *Aspergillus oryzae* culture, 2-hydroxy-4-(methylthio) butanoic acid, milk performance

758 Performance of Nili-Ravi buffaloes as influenced by feeding wheat straw fermented with rumen digesta treated without or with fibrolytic enzymes. M. Nisa*, A. Rehman, M. Sarwar, M. A. Shazad, and O. A. Khan, *Institute of Animal Nutrition and Feed Technology, University of Agriculture, Faisalabad, Punjab, Pakistan.*

An experiment using 12 mid-lactating multiparous Nili-Ravi buffaloes (weight 575 ± 17 Kg, 105 ± 15 d in milk) in a randomized complete block design was conducted to examine the influence of feeding wheat straw fermented with rumen digesta (RD) treated without or with fibrolytic enzymes on nutrient intake, digestibility, and milk production and composition. Fermented wheat straw was prepared by blending 70 kg wheat straw, 20 kg RD, 4 kg urea and 6 kg molasses on a dry matter (DM) basis. The 50% moisture concentration of this blend was maintained by adding water at the time of ensiling. Four iso-nitrogenous and iso-caloric diets were formulated. The diets containing unfermented wheat straw without or with enzymes were designated as $UFWS^-$ and $UFWS^+$. The diets containing fermented wheat straw without or with enzymes were designated as FWS^- and FWS^+. Dry matter, crude protein (CP) and neutral detergent fiber (NDF) intakes were the highest ($P < 0.05$) in buffaloes fed FWS^+ diet and were the lowest in animals fed $UFWS^-$ diet. A linear increase ($P < 0.05$) in DM and NDF digestibility were noticed in buffaloes fed FWS^+ diet than those fed FWS^-, $UFWS^-$ and $UFWS^+$diets. All animals were in positive nitrogen balance but the highest ($P < 0.05$) nitrogen balance was observed in animals fed FWS^+ and FWS^- diets. Blood urea nitrogen remained unaltered ($P > 0.05$) across all diets. Milk production, milk lactose, solids not fat and total solids remained unaltered ($P > 0.05$) across all diets. Results indicated that intake and digestibility of nutrients were higher ($P < 0.05$) in animals fed FWS^+ diet than those fed $UFWS^+$ diet.

Key Words: fibrolytic enzyme, fermented wheat straw, rumen digesta