supplementation of dairy cows with polyphenol-based sugarcane extract did not change the composition, production and quality of milk (Table 1).

**Key Words:** milk composition, somatic cell count

**1221M 25-Hydroxyvitamin $D_3$ supplementation increased productive performance during lactation in dairy cows.** J. M. Albuquerque[1], C. Cortinhas[2], T. Acedo[2], A. S. Silva[1], K. M. Borges[1], J. Diavão[1], M. H. Ferreira[3], F. C. F. Lopes[1], M. M. Campos[1], D. S. C. Paciullo[1], C. A. M. Gomide[1], M. J. F. Morenz[1], and P. Gott*[4], *[1]Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, [2]DSM Produtos Nutricionais, São Paulo, São Paulo, Brazil, [3]Federal University of Juiz de Fora, Juiz de Fora, Minas Gerais, Brazil, [4]DSM Nutritional Products, Parsippany, NJ.*

Vitamin $D_3$, which plays an important role in modulating bone, mineral and energy metabolism. Dietary supplementation of 25-hydroxyvitamin $D_3$ is more effective at increasing the concentrations of 25-hydroxyvitamin $D_3$ in blood. The aim of this study was to evaluate the effects of 25-hydroxyvitamin $D_3$ [25(OH)$D_3$] on productive performance, dry matter intake (DMI), feed efficiency, body weight (BW), body condition score (BCS), and serum and plasma metabolites of grazing lactating dairy cows. Twenty-two Holstein × Gyr cows [18 ± 3.5 kg/d milk yield and 94 ± 21.9 d in milk (DIM)] were blocked according to milk yield and allocated to 1 of 2 treatments in a completely randomized block design. Treatments were: (1) no addition of 25(OH)$D_3$ (CTRL) or (2) 25(OH)$D_3$ at 1.0 mg/cow/d (Rovimix HyD, DSM Produtos Nutricionais). Treatments were mixed into 10 g of a finely ground corn and top-dressed to the concentrate (3 kg/cow) offered during the morning and afternoon milking. Diets were formulated according to NRC (2001). Pasture was composed by *Megathyrsus maximus* cv. Mombaça. Cows were adapted to the experimental diets for 14 d and the measurements lasted 56 d. Titanium dioxide was used to estimate forage intake. Blood samples were collected 2 h after the morning feeding on d 21 and 71. Data were analyzed using SAS and statistical significance was defined at $P \leq 0.10$. No treatment effects were observed on pasture or total DMI. Cows fed 25(OH)$D_3$ had higher fat (CTRL = 15.3 vs. 25(OH)$D_3$ = 16.8 kg/d; $P = 0.09$) and energy-corrected milk ($P = 0.09$), but no effects on milk composition, milk urea nitrogen, and feed efficiency were observed. Also, 25(OH)$D_3$ increased BCS compared with CTRL cows ($P = 0.07$), without difference in BW. Plasma concentration of 25(OH)$D_3$ was increased on d 71 (CTRL = 32.1 vs. 25(OH)$D_3$ = 70.8 ng/mL; $P = 0.01$) for 25(OH)$D_3$ cows. Plasma nonesterified fatty acids was 34% greater for 25(OH)$D_3$ than CTRL ($P = 0.03$), but no differences were observed on plasma Ca and Mg. In conclusion, dietary supplementation of 25(OH)$D_3$ brings benefits on productive performance of lactating grazing dairy cows.

**Key Words:** milk yield, tropical grass pasture

**1222M Changes of rumen microbes related to hormonal response in the rumen of lactation dairy cows under heat stress.** Z. Guo, S. Gao, L. Ma, and D. Bu*, *State Key Laboratory of Animal Nutrition, Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing, China.*

Microorganisms could perceive the neurohormones secreted by animals under stress to regulate their own growth activities, and the harmful metabolites released are also regulated by the neurohormones secreted by the host animals. However, the regulation mechanism of ruminal hormones on rumen microbes is still unclear in lactation dairy cows. The purpose of the current study was to investigate the effect of heat stress on hormonal response in rumen as well as its regulation to rumen microbes. Eight multiparous Holstein dairy cows with rumen cannula were randomly equally allocated to 2 replicates (n = 4), with each replicate being subjected to heat stress (HS) or thermal neutrality and pair-feeding (PFTN) in 4 environmental chambers. Samples of blood, rumen fluid and saliva were collected every other day in the trial period of each replicate for the analysis of growth hormone, insulin, cortisol and inflammatory factors. Meanwhile, the change of ruminal pH as well as the frequency of rumen contraction was recorded every hour on the last day of the trial period. The results showed that heat stress significantly reduced the pH value of rumen fluid (6.34 vs. 6.71, $P = 0.034$), but had no significant effect on rumen motility frequency (25.6 vs. 25.0 times/s, $P = 0.782$), suggesting the decrease in rumen pH is more likely due to the decrease in the saliva swallowed in the rumen instead of the changes of rumen peristalsis. Compared with the PFTN group, heat stress decreased the concentration of cortisol hormone in blood (6.32 vs. 9.57 ng/mL, $P = 0.035$) and growth hormone in rumen fluid (4.41 vs. 8.63 ng/mL, $P = 0.007$) of dairy cows, but increased the concentration of insulin in rumen fluid (262.19 vs. 107.31 μIU/mL, $P = 0.011$). In addition, the total amount of TNF-a (55.95 vs. 35.52 pg/mL, $P = 0.044$) in the blood during heat stress increased significantly compared with the PFTN group. Overall, the consistent trend changes of insulin and growth hormone in rumen fluid and blood may inform the potential hormonal interaction between the rumen microbes and the host dairy cows.

**Key Words:** rumen microbes, heat stress, hormone

**1223M Complete genome sequence of *Corynebacterium* sp. SCR221107, a potential probiotic strain, isolated from the rumen fluid of Holstein dairy cows.** S. H. Na[1], K. S. Baik[1], S. H. Kim[1], A.-R. Son[1], M. J. Ku[2], and S. S. Lee*[1], *[1]Ruminant Nutrition and Anaerobe Laboratory, College of Bio-Industry Science, Sunchon National University, Suncheon, Republic of Korea, [2]Livestock Research Institute, Jeonnam Agricultural Research and Extension Services, Gangjin, Republic of Korea.*

The *Corynebacterium* sp.SCR221107 was isolated from the rumen fluid of Holstein dairy cows collected from local farm in Republic of Korea. The strain was incubated in an anaerobic atmosphere (5% carbon dioxide, 5% hydrogen, and 90% nitrogen) at 37°C for 48 h on DeMan, Rogosa and Sharpe (MRS) media. *Corynebacterium* sp.SCR221107 is the functional probiotic candidate with an ability to vitamin $B_{12}$ production. The whole genome of *Corynebacterium* sp.SCR221107 was sequenced using the PacBio RS II platform and Illumina HiSeq platform, and assembled de novo. The complete genome of the *Corynebacterium* sp.SCR221107 contains one circular chromosome (3,043,024 bp) with a guanine + cytosine (GC) content of 60.1%. Annotation analyses revealed 2,639 protein-coding sequences, 15 rRNA genes, and 57 tRNA genes. Based on genome analysis, we found that *Corynebacterium* sp.SCR221107 possessed various genes associated with vitamin $B_{12}$ synthesis and transport. The genome information adds to the comprehensive understanding of *Corynebacterium* sp.SCR221107 and suggest that the isolate might have a potential probiotic application.

**Key Words:** *Corynebacterium* sp., Holstein dairy cow, vitamin $B_{12}$

**1224M Effects of feeding silage inoculated with microbial inoculants on lactational performance, and rumen fermentation of transition dairy cows.** C. Niño-de-Guzman*[1], J. Portuguez[2], R. Trumpp[2], D. Vassolo[1], C. Cornejo[1], S. Paladugu[1], L. Lima[1], F. Amaro[1], K. Arriola[1], and D. Vyas[1], *[1]Department of Animal Sciences, University*