

Session: Dairy: Feed Additives II (poster)

T295

Day/Time/Location: Tuesday, July 17, 2012, 7:30 AM - 9:30 AM, North Hall AB

Does mechanical mixing of TMR compromise protection efficacy of rumen-protected lysine products? P. Ji*, C. S. Ballard, R. E. Clark, B. M. Sweeney, and C. Kokko, *William H. Miner Agricultural Research Institute, Chazy, NY.*

A study was conducted to determine if mechanical mixing of TMR compromises the ruminal protection efficacy of 6 rumen-protected Lys products (RPL). A Super Data Ranger (SDR) loaded with 350 kg of TMR formulated for high producing cows was used to simulate the routine mixing procedure on a dairy farm. Dacron bags were filled with 1 ± 0.03 g RPL and heat-sealed. Triplicate bags per in situ time point were either mixed with diet for 6 min at full speed in SDR as treatment or indwelled in a bucket of same TMR diet for 6 min as control. Three loads of mixing were performed. After mixing, bags were incubated in the rumen of 3 cannulated cows for 0, 6, 12, and 24 h, one mixing load (control and treatment) per cow. After incubation, bags were gently hand-washed and paper-patted, then air-dried for more than 24 h. Dried RPL residue collected from each bag was acid hydrolyzed with 3 N HCl at 90°C in oven for 60 min and brought to a 100 mL volume with 0.2 mol/L HCl buffer. The solution was filtered and the concentration of Lys was determined by ultra performance liquid chromatography for calculation of ruminal disappearance of Lys (RD, %). Data for each RPL were analyzed separately as a randomized complete block design with MIXED procedure of SAS. The results showed that mechanical mixing increased RD ($P < 0.05$) of LysiPEARL (68.5 vs. 74.7%), MetaboLys (15.0 vs. 17.1%), and USA Lysine (72.2 vs. 75.9%), and tended to increase RD of Megamine-L (51.2 vs. 52.9%; $P = 0.06$), but did not affect that of AminoShure-L (30.6 vs. 33.0%; $P = 0.12$), and AjiPro-L (13.0 vs. 13.1%; $P = 0.92$). Length of ruminal incubation significantly increased RD of all RPL with varying magnitudes ($P < 0.01$). All RPL except AminoShure-L exhibited a significant interaction between mixing treatment and length of ruminal incubation ($P < 0.05$). In conclusion, some RPL are more vulnerable than others to damage caused by mechanically mixing in a TMR that compromises their ruminal protection. However, due to different shape and particle size of RPL, the specific gravity and ruminal passage rate may vary and should be considered when comparing potential ruminal Lys loss of RPL.

Key Words: rumen-protected Lys, mechanical mixing

Notes:
