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Effects of slow-release urea on ruminal digesta characteristics and growth performance in beef steers

C. C. Taylor-Edwards*, G. Hibbard*, S. E. Kitts*, K. R. McLeod*, D. E. Axe**, E. S. Vanzant*, N. B. Kristensen*** and D. L. Harmon*

* Department of Animal and Food Sciences, University of Kentucky, Lexington 40546-0215; and ** Agri-Nutrients Technology Group, Petersburg, VA 23803; and *** University of Aarhus, Faculty of Agricultural Sciences, Tjele, DK-8830, Denmark

Abstarc :

Two experiments were conducted to evaluate the effects of slow-releaseurea (SRU) versus feed-grade urea on ruminal metabolite characteristicsin steers and DMI, gain, and G:F in growing beef steers. Experiment1 used 12 ruminally cannulated steers (529 ± 16 kg ofBW) to monitor the behavior of SRU in the ruminal environment.Compared with feed-grade urea, SRU decreased ruminal ammoniaconcentration ($P = 0.02$) and tended to increase ruminal ureaseactivity ($P = 0.06$) without affecting ruminal VFA molar proportionsor total concentrations ($P > 0.20$). After 35 d of feeding,the in situ degradation rate of SRU was not different betweenanimals fed urea or SRU ($P = 0.48$). Experiment 2 used 180 Angus-crosssteers (330 ± 2.3 kg) fed corn silage-based diets supplementedwith urea or SRU for 56 d to evaluate the effects on feed intake,gain, and G:F. The design was a randomized complete block witha 2 x 4 + 1 factorial arrangement of treatments. Treatmentsincluded no supplemental urea (control) or urea or SRU at 0.4,0.8, 1.2, or 1.6% of diet DM. Over the entire 56 d experiment,there were interactions of urea source x concentration for gain($P = 0.04$) and G:F ($P = 0.01$) because SRU reduced ADG and G:Fat the 0.4 and 1.6% supplementation concentrations but was equivalentto urea at the 0.8 and 1.2% supplementation concentrations;these effects were due to urea source x concentration interactionsfor gain ($P = 0.06$) and G:F ($P = 0.05$) during d 29 to 56 ofthe experiment. The SRU reduced DMI during d 29 to 56 ($P = 0.01$)but not during d 0 to 28, so that over the entire experimentthere was no difference in DMI for urea source ($P = 0.19$). Thesecollective results demonstrate that SRU releases N slowly inthe rumen with no apparent adaptation within 35 d. Supplementationof SRU may limit N availability at low (0.4%) concentrationsbut is equivalent to urea at 0.8 and 1.2% concentrations.

Key Word :
metabolism, nitrogen, nonprotein nitrogen, ruminant, steer, urea

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