DAILY VARIATIONS IN RUMEN AND BLOOD PARAMETERS IN DAIRY COWS GRAZING PASTURE IN SPRING AND
SUPPLEMENTED WITH TWO SOURCES OF NITROGEN

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Introduction: Additives in the diet are used in milk production to improve ruminal function in cows.

Objective: To evaluate the effects of two sources of nitrogen on ruminal and metabolic performance in grazing dairy cows.

Material and methods: Four rumen fistulated Holstein Frisian cows grazing a spring pasture (Lollium perene, DM= 14.1±2.3%;
CP= 24.2±1.1% DM; ME= 2.89±0.06 Mcal kg DM) were assigned into a 4x3 latin square design with three periods of 15 days each.
Experimental groups were
C =control;
U= supplemented with urea (135g/day; 2x/day) and
PU= supplemented with protected urea (Optigen II, 150g/day; 2x/day).

All cows were fed with flaked corn (3.75 kg/cow /day, DM= 85%; CP= 7.7%; ME= 2.9 Mcal kg DM), distributed in two rations at
milking times. Rumen fluid samples were obtained just before supplementation and hourly until 16.5 hours after supplementation to
determine pH and N-ammonia. Blood samples were obtained at the same times on days 0, 8 and 15 of the experimental period to
evaluate energy and protein metabolic status by determination of the plasma concentrations of urea, βOH-butyrate, NEFA, glucose
and lactate.

Results: The ruminal pH was similar (P>0.05) among the groups (6.30±0.43, 6.31±0.40 and 6.28±0.42, in C, U and PU
respectively). The mean N-ammonia concentrations increased significantly after supplementation in U and PU groups. However,
mean value was lower (P< 0.05) in PU (30.6±18.0mM) than in U (33.5±17.2mM). C group value (26.5±14.9mM) was lo
der lower than U.
The plasma urea concentration remained constant (P>0.05) during the day in all groups. It mean value was higher (P< 0.05) in
U (6.49±1.83mM) than C (5.69±2.07mM); PU wasn't significantly lower than U (6.14±1.52mM, P>0.05). Nitrogen supplemen
tation did
not modify the plasma concentrations of energy metabolites along the day. Only small differences were found in the mean values of
this metabolites: βOH-butyrate (C= 0.64±0.24 mM; U= 0.66±0.23 mM, PU=0.69±0.25 mM); NEFA (C= 0.10±0.12 mM, U=
0.09±0.11 mM, PU=0.07±0.06 mM); glucose (C=4.24±0.40 mM, U=4.01±0.44 mM, PU=4.00±0.48 mM); and lactate (C=
0.68±0.42 mM, U=0.76±0.45 mM, PU= 0.64±0.33 mM).

Conclusions: N supplementation with urea increases the concentrations of ruminal N-ammonium and plasma urea, but the use of
protected urea reduces this effect. The use of both N sources did not modify the daily variation in the energy plasma metabolites
concentrations.

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