Poster Session 29

Isabelle.Dufrasne@ulg.ac.be

Influence of grass composition on milk urea content with grazing dairy cows

Dufrasne I., Robaye V. Istasse L. and Hornick J.-L.

University of Liège, Nutrition Unit, Liège, Belgium

Corresponding author: Isabelle.Dufrasne@ulg.ac.be

Introduction

Environment, nitrogen (N) losses and pollution are acute problems. N excretion in cattle increases with high dietary crude protein (CP) level. The CP content of grazed grass in intensive grassland production is often largely in excess to the requirements in the dairy cows. Furthermore, it is difficult to estimate N excretion in pastures. Indicators are therefore needed to evaluate risks of N losses. The first aim of this study was to evaluate the effects of grass composititon on milk urea content. The second was an attempt to predictf milk urea content from the chemical composition - fat (MF) and protein (MP) – of milk, parameters easily avalaible in commercial farms.

Materials and methods

- The present data were obtained from grazing trials carried out at the Experimental Research Station of Liège University during 11 years with a mean herd of 40 dairy cows grazing in a rotational system.
- The cows calved in January and grazed from the beginning of May till mid October
- The cows received 1 kg of dried sugar beet pulp per day.
- Milk samples were analysed by "Comité du lait" on tank samples obtained when the milk was transferred from the farm to the dairies every 2 or 3 days
- Milk fat, protein, and urea contents were determined by infrared method (Milkoscan FT 6000 – Foss Denmark)
- Grass composition was determined by NIR method

Results and discussion

- Milk urea content increased during the grazing season. This observation is usual in commercial herds. The highest values can reach 600 mg/l.
- The post calving days increased also with the advancing grazing period. Milk fat and protein contents showed little changes during the season except at the end of the grazing season when the cows were near the dry period.
- The CP content in grass increased and values higher than 200 g/kg DM were observed from September. Soluble carbohydrates (SC) content decreased and values lower than 100 g/kg DM were usually observed from Augustus.
- Significant relationships were calculated between milk urea (mg/l) and chemical components of grass or milk. The correlation coefficients were improved when SC, post calving days, MP and MF were included in the model (Table 1).

Milkoscan FT 6000

Figure 1. Evolution during the grazing season of grass CP and SC, milk fat, protein and urea contents.

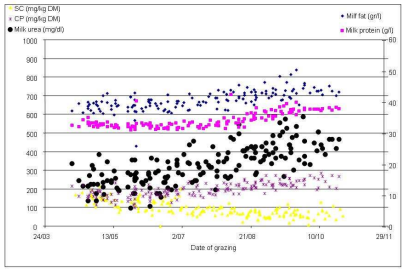

Table 1. Relationships between milk urea content (mg/l) and chemical components in grass and in milk.

y = -10.2 + 1.71 CP	r^2 = 41.1%	P<0.01
y = 215 + 1.02 CP - 0.92 SC	r^2 = 47.3%	P<0.001
y = -364 + 0.434 CP - 0.493 SC + 0.273 post calving day + 0.04 MP + 0.113 MF	r^2 = 63.2%	P<0.001

Conclusion

According to the litterature, milk urea content is highly correlated with CP intake. From the present experimental data, the relationship was significant between milk urea and CP in grass. The relationship was improved if post calving days, SC in grass and milk components were included. The N metabolism of grazing dairy cows seems therefore more complex than when fed indoors. In rotational grazing, grass composition changed during the presence of cows in the paddock and during the season according to the temperature and the length of the day. More research is needed to improve the relationship to predict milk urea concentration at grass.

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