Variations in milk production and composition in response to a lengthened milking interval

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Introduction

Milking intervals can be voluntary lengthened to reduce workload using once-daily milking or involuntary with milking robots when herd is oversized compared to robot capacity.

Longer milking intervals such as once-daily milking induce changes in milk composition. However little is known about the early variations in milk fine composition observed on the first lengthened milking interval.

Materials and methods

- Treatment: omission of morning milking on only one day (milking omission, MO) after a 7-d control period (C) with 2 milking per day. Cows were milked at 07:00 and 16:00 during C period and at 16:00 on MO day.
- 32 primi- and multiparous Holstein cows at 184±29 days in milk and producing 34.1±5.4 kg.d^{-1} of milk.
- Measurements:

- Milk yield: at each milking.
- Milk composition : fat, protein, lactose, and cell contents (at each milking for 3 consecutive days of the C period, and on the MO day). Enzymatic activities (lipolysis index, plasmin and plasminogen activities) and lactoferrin content were measured 2 days before MO and on MO day.
- Dry matter intakes: every day.

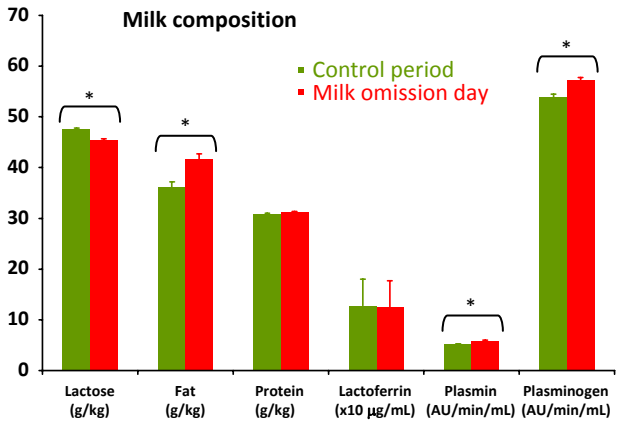
- Statistics: Data were analysed using the GLM procedure of SAS.

Results and discussion

- A mean decrease in milk yield of 20%, from 34.1 to 27.3 kg/d in response to MO with no change in DM intake.

Variations in milk composition?

- No change in lipolysis index, milk protein and lactoferrin contents.
- A decrease in milk lactose content of 2.1 g/kg.
- An increase in milk fat content of 5.5 g/kg.
- An increase in SCS from 2.0 to 3.2.
- Increases in milk plasmin and plasminogen activities from 2.06 to 2.35 and from 21.6 to 22.9 10^{-3} AU/min/mL resp., resulting in an increase in plasmin:plasminogen ratio from 0.098 to 0.106 units.



* : significantly different at P=0.001

Conclusion

Milk biochemical composition is modified from the first 24h-lengthened milking interval. Increased plasmin activity (and somatic cell counts) could contribute to enhance proteolysis and modify the profile of the soluble peptides fraction in milk. This could have further possible implication in hard cooked cheese technology where plasmin activity is enhanced by high temperature cooking.