Effect of robotic and conventional milking on milk yield and milk composition of primiparous cows

F. M. Tangorra & M. Zaninelli

Department of Veterinary Sciences and Technology for Food Safety, University of Milan, via Celoria 10, 20133 Milan, Italy
E-mail: francesco.tangorra@unimi.it

Summary

The introduction of AM-systems has a large impact on milk yield and milk quality. Many authors reported an average increase of milk yield in cows milked by an AMS in comparison with cows milked by a conventional milking parlour (Svennrsten-Sjaunja *et al.*, 2000; Hogeveen *et al.*, 2001). On the contrary, a negative trend in milk fat and protein contents related to automatic milking was observed by several authors (Friggens and Rasmussen, 2001;Wirtz *et al.*, 2002). Between June 2002 and April 2003 a field-based experiment was carried out to evaluate the effect of robotic and conventional milking on milk yield and milk composition of first lactating cows. The experiment involved two groups (Group 1 and Group 2) of 10 animals each, characterized by similar physiological and health conditions. Group 1 was subjected to automatic milking and Group 2 was milked conventionally twice a day. Group 1 showed a higher mean daily production, a lower milk fat and protein contents, and a higher SCC in comparison with Group 2.

Keywords: Automatic milking system, milk yield, milk composition

Introduction

Between June 2002 and April 2003 a comparison of an Automatic Milking System (AMS) with a conventional milking parlour was carried out in a commercial farm in the North Italy. At the same time 10 primiparous cows (Group 1) were milked automatically by a robot (Fullwood-Merlinä) and 10 primiparous cows (Group 2) were milked conventionally twice a day (12 h interval between milking cycles) in a herringbone milking parlour, 5+5 stalls.

Material and methods

Primiparous involved in the study were selected from the herd of the farm using the following criteria: <30 days in milk (DIM), no intramammary infections (IMI), somatic cell count (SCC) lower than 200.000 SCC/ml, in order to have similar starting conditions.

Primiparous cows were housed in mat-lined freestalls and were fed by unifeed system. A concentrate amount of 1 kg per day was given in order to lure the primiparous cows into the robot.

The following values were recorded individually for each cow involved in the experiment: daily collection of milk yield, number of visits with milking per day (for Group 1). Every month the milk fat and protein content and the somatic cells count (SCC) were analyzed.

Recorded data were submitted to GLM procedure, SAS statistical package, 2000 to evaluate milking system effects on milk yield and milk composition of the two groups.

Results and discussion

Group 1 milked by AMS showed a higher mean daily production in comparison with Group 2 milked conventionally ($31,58 \pm 0,50$ kg vs. $28,25 \pm 0,49$ kg). Milk fat and milk protein contents in Group 1 were lower than in Group 2 (3,12% vs. 3,85% for fat and 3,29% vs. 3,82% for protein). SCC was higher in Group 1 compared with Group 2 (5,36 Log_{10} cells/ml vs. 5,28 Log_{10} cells/ml) but in both groups no differences were detected in the frequency of clinical mastitis. Results obtained confirm that automatic milking guarantees an average increase of daily milk yield, although the higher number of daily milking cycles decrease fat and protein contents. About SCC cows milked by the AMS showed a higher level of somatic cell/ml of milk in comparison with the animals conventionally milked, although the difference was not statistically significant.

References

Friggens, N. C. and Rasmussen, M. D., 2001: Milk quality assessment in automatic milking systems: accounting for the effects of variables intervals between milkings on milking composition. Livestock Prod. Science. 73:45-54.

Hogeveen, H., van der Vost, Y., de Koning, C., Slaghuis, B., 2001: Concepts et implications de la traite automatisee. Symposium sure les bovines laitiers, 104-120, CRAAQ, Canada.

SAS User's Guide: Statistics, 2001. SAS Inst., Inc., Cary, NC.

Svennenrsten-Sjaunja, K., Persson, S., Wiktorsson, H., 2002: The effect of milking interval on milk yield, milk composition and raw milk quality. Proceedings of The First North American Conference on Robotic Milking, Toronto, Canada, V 43-48.

Wirtz, N., Oechtering, K., Tholen, E., Trappmann, W., 2002: Comparison of an automatic milking system to a conventional milking parlour. Proceedings of The First North American Conference on Robotic Milking, Toronto, Canada, III 50-55.