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Influence of the quarter-individual milking system “MultiLactor” on the milk yield and quality in dairy cows: Results of a field study

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Abstract

The mechanical forces during machine milking lead to changes in the teat tissue. This effect is related to the degree of adaptation of the milking machines to the physiological requirements of the dairy cows. If the milking machine settings and liners are not suitable for all dairy cows on the farm, the teat condition will deteriorate and some animals may suffer from mastitis. In addition, the purpose of milking machines is to harvest milk at optimal speed while maintaining animal comfort and teat defence mechanisms against invading mastitis pathogens. Therefore, the milking machine is a crucial factor in optimising milk yield and quality. The aim of this study was to examine the influence of a quarter-individual milking system “MultiLactor” (ML) on milk yield and quality. 170 Holstein-Friesian dairy cows were used on a farm in Switzerland. The cows were milked three times a day with an ML milking system. The working vacuum level was 36 kPa and sequential pulsation (25% each quarter) was adopted. The pulsation rate was 60 cycles per minute and the pulsation ratio was 60/40 during the milking time. Milk yield recording and milk sampling were performed monthly for one year from each cow. The major milk parameters were then analysed by the Swiss milk record Association. For statistical evaluation, the mixed procedure of SAS was used. Significant differences ($p < 0.05$) were localised using the LSD test. Mean milk yield was 35.84 ± 0.28 kg cow⁻¹ day⁻¹. This corresponds to an annual milk yield of 12000 kg cow⁻¹. Mean milk composition values were 4.36 ± 0.02 %, 3.28 ± 0.01 %, 4.75 ± 0.01 %, 20.65 ± 0.20 mg dl⁻¹ and $99.63 \pm 6.48 \times 10^3$ cells ml⁻¹ for fat, protein, lactose, urea, and somatic cell count (SCC) respectively. It was also shown that the cows remained healthy on the farm during the study period. In conclusion, an ideal milking machine adapts to the morphological, anatomical, and physiological characteristics of the udder and teats of dairy cows and it should achieve a physiological ideal milking process meeting high animal welfare standards for increased milk production with high quality standard.

Keywords: Cow, fat, lactose, milk, MultiLactor, protein, SCC, urea