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Original article

Evaluation of rumination time, subsequent yield, and milk trait changes dependent on the period of lactation and reproductive status of dairy cows

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Abstract

The aim of this research was to determine rumination time (RT) and the subsequent milk yield, along with trait changes during lactation dependent on the reproductive status of dairy cows.

728 cows were selected for evaluation in regards to 1–150 days of milk production (DIM). According to their period of lactation and reproductive status, the cows were selected for the following groups: Inseminated (1–35 days after insemination, n=182), Open (45–90 days after calving, n=126), Fresh (1–44 days after calving, n=45); Not-pregnant (>35–60 days after insemination and not-pregnant, n=55); Pregnant (35–60 days after insemination and pregnant (n=320). The animals were milked with Lely Astronaut® A3 milking robots. The daily milk yield, rumination time, bodyweight, milk composition (fat, protein, lactose, somatic cell count and gynecological status date) were collected from the Lely T4C management program for analysis.

We estimated the lowest productivity in the pregnant cows, where the average milk yield was 28.72 kg and the highest productivity in the fresh cow ($p < 0.001$) (Table 1). The longest rumination time was determined for the inseminated cows, statistically significantly higher at 9.92% ($p < 0.001$) than in the non-pregnant cows, whose rumination time was the shortest. The statistically reliably RT positively correlated with productivity ($r = 0.384$, $p < 0.001$) of the cows (from $r = 0.302$ in the second lactation and $r = 0.471$ in the first lactation to $r = 0.561$ in multiparous cows; $p < 0.001$). Rumination time, according to groups of cows by milk yield, had a tendency to increase (2.14 times) from 202.0 ± 87.38 (in cows with a productivity of less than 10 kg milk) to 431.6 ± 33.91 (in cows with a milk yield higher than 50 kg) by the linear regression equation: $y = 38.02x + 232$, $R^2 = 0.721$ ($p < 0.001$). The relation between the gynecological status and milk fat-protein ratio of the cows was statistically significant ($\chi^2 = 2.974$, $df = 8$, $p < 0.0001$). The longest rumination time was determined for the inseminated cows (1–35 days after insemination), and the shortest for the not-pregnant cows (>35–60 days after insemination and not-pregnant).

We can conclude that rumination time, subsequent yield, and milk trait change depends on the period of lactation and reproductive status of a dairy cow.

Key words: cow, rumination, milk yield, reproduction