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Quantitative Behavior in Dairy Cows under the Conditions of Automatically and Conventionally Milking Systems

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Introduction- Automatically milking systems increased in the last years in the European Union. Behavior of lactating dairy cows in the barn can be used to evaluate the effects of changing in the procedures of milking like Forced Cow Traffic (AMS and VMS) and the design of management in the waiting area (AMR).

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Quantitative Behavior in Dairy Cows under the Conditions of Automatically and Conventionally Milking Systems

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I. Introduction

Automatically milking systems increased in the last years in the European Union. Behavior of lactating dairy cows in the barn can be used to evaluate the effects of changing in the procedures of milking like Forced Cow Traffic (AMS and VMS) and the design of management in the waiting area (AMR).

II. Material and Methods

Conventional milking systems (CONV; 5 farms) were used in this investigation as "standard". Data's from 4 farms with AMS /VMS and 1 farm with AMR provided the basis for the automatically milking systems. In this investigation were used 18-25 dairy cows in each farm for measurement of quantitative behavior (time for lying and lying + ruminating, standing and standing + ruminating, milking and others) over 24 hours. The behavior of cows was observed directly with Time-Sampling-method (5 minutes). In the farm with AMR24 data collection of behavior was every month over a period for more than 1 year.

III. Results and Discussion

Under the condition of AMR and most of other farms delivery of feed were once a day. The average feeding time of all cows were 275 ± 73 minutes per cow and day and show the same level such as DLG (2012) and HOY et al. (2009). Between milking systems there are significant differences in feeding time (figure 1).

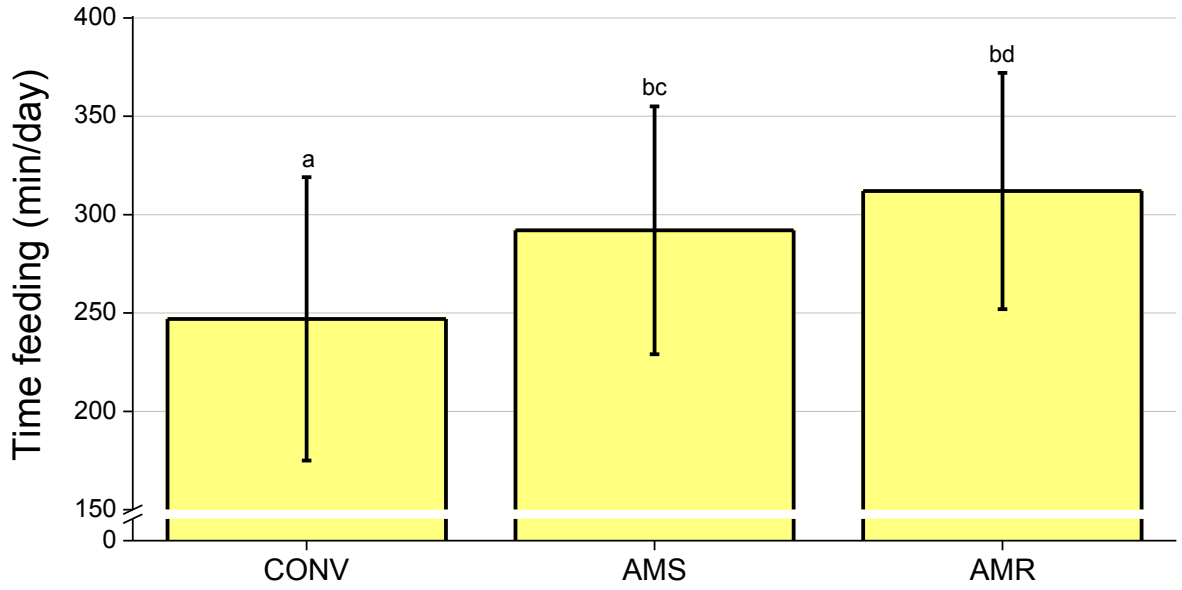

Figure 1 : Time duration for feeding time per cow and day

In the system of AMR were found an average lying time of 702 ± 107 minutes per day and in the conventional milking systems of 652 ± 139 minutes per day. Cows under the condition of AMS / VMS show an average lying time per day of 593 ± 149 minutes, while between free cow traffic and forced cow traffic no significant difference (SHAHHOSSEINI, 2013). JENSEN et al. (2005) and MUNKSGAARD et al. (2005) found an average lying time per cow and day of 12-14 hours, in contrast to HOY et al. (2009) with 7-14 hours per cow and day and 9-11 hours of cows at pasture (PHILLIPS and RIND, 2001; TUCKER et al., 2007). Ruminating time in the investigation was 501 ± 78 minutes per day while ruminating during lying was 69 % and ruminating during standing was 31 %.

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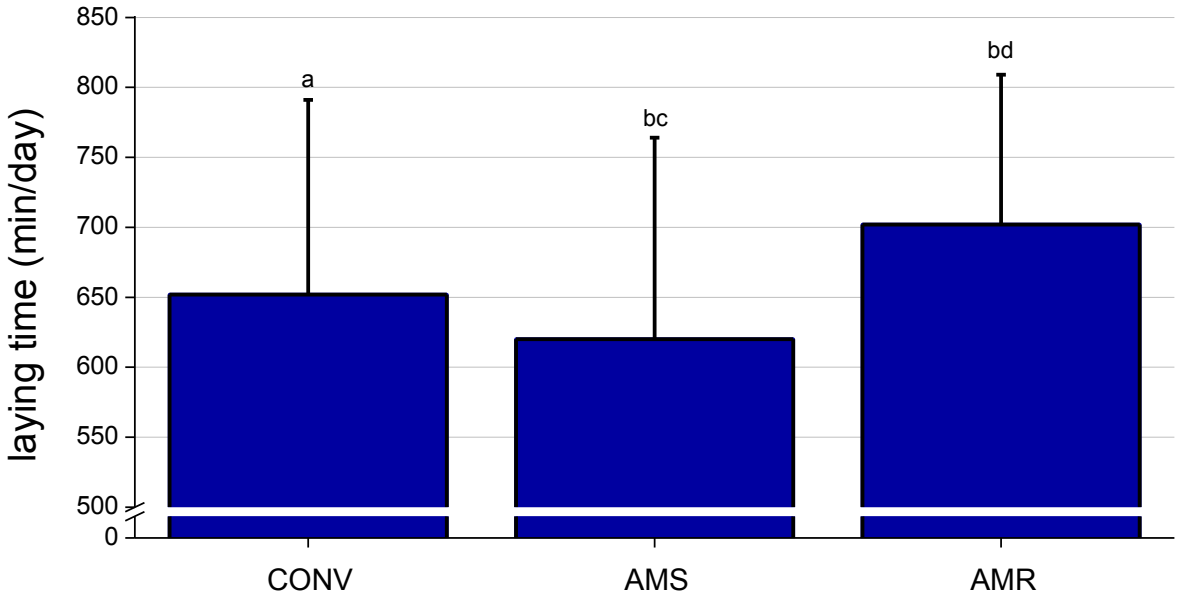

Figure 2 : Time duration for lying per cow and day

Calculation by means of univariate analysis of variance with fixed effects of milking system and farms showed no significant effect of milking system with significant effect of farms for lying time of cows per day (table 1). This shows very clearly the influence of management in dairy production for behavior of cows.

Table 1 : lying time of cows per day independent from the farms

System	AMR	AMS				CONV				
	1	1	2	3	4	1	2	3	4	5
Time (h/d)	702	572	617	651	646	669	716	549	596	798

The maximum time duration of the cows for standing (standing in the alley or stall and during the milking) were found under conventional milking systems with an average of 554 minutes per cow and day observed. The two automatically milking systems (AMS and AMR) showed significant lower time budgets (figure 3). GOMEZ and COOK (2010) found in 17 freestall barns in Wisconsin's an average time budget for standing + milking with 474 minutes per day which is comparable with AMR (458 minutes per cow and day).

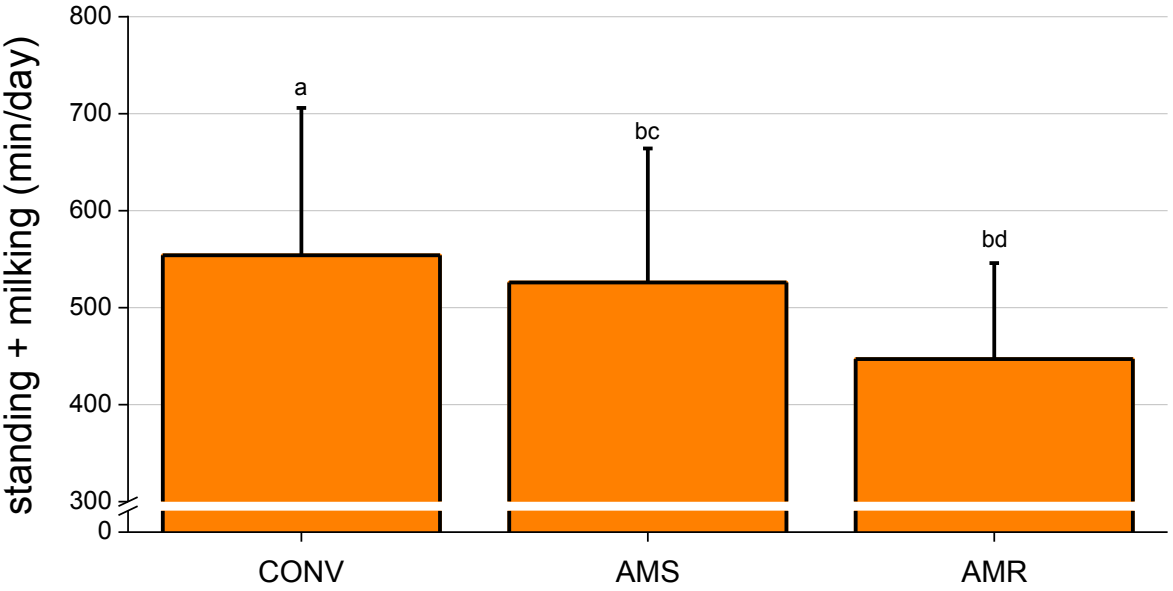

Figure 3 : Time duration for standing + milking per cow and day

IV. Conclusion

The investigation showed a significant influence of milking systems to the animal welfare - criteria's such as lying time and the time for standing and milking of dairy cows. An average lying time of 11 hours per cow and day can be founded. Further investigations with fixed effects such as season or number of lactations are planned and should be improve the results.

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