

Factors that Influence Resting Time as an Indicator of Cow Comfort in Lactating Dairy Cows

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Introduction

Resting time is commonly accepted as an indicator of cow comfort. Current knowledge establishes that cows need to rest as much as possible to produce milk at their genetic potential. In order to evaluate the best housing and management strategies to maximize cow comfort, it is necessary to first establish factors that influence resting time in lactating dairy cattle and determine which of those are manageable.

Materials and Methods

This is a longitudinal observational study based on daily monitoring of cows at the teaching herd at Oregon State University, accomplished via an automated system that monitors lactating cows twice daily (at each milking). Cows are fitted with the Pedometer Plus (afimilk[®], Israel), which acts as RFID and measures steps and resting time through an imbedded clinometer. Resting time was compared to all other parameters monitored in the herd (breed, lactation number, days-in-milk (DIM), gestation length, milk production, fat, protein, and lactose content in milk (proxies for metabolic disease), milk conductivity (proxy for mastitis), and activity (proxy for heat detection and lameness)).

Results

Resting time has a specific pattern throughout the lactation of a cow, inversely related to milk production and directly related to gestation length. First lactation

cows rest less time than adult cows during the first month of lactation, then rest similar time to adult cows. Additionally, there is a clear diurnal pattern in resting time; 101.5±38.9 minutes more during the night session (4PM-4AM) than during the day (4AM-4PM).

Holstein cows rested on average 102.5±43.1 minutes per day more than Jersey cows, independent of DIM, both showing therefore a parallel resting time curve throughout the lactation. The effect of breed was also consistent across lactation numbers (first lactation vs adult cows). Disease events (metabolic disease, mastitis and lameness) and extreme weather transiently influenced resting time.

Significance

Results of this study show a specific pattern of resting time inversely related to the lactation curve (milk production) and gestation length. A previous cross-sectional study suggested a positive linear and independent correlation between milk production and resting time. However, that study did not study longitudinal changes in resting time throughout the lactation. Other factors such as breed, time of day, weather, and disease influence the length of resting time but do not alter the pattern. Based on our results, resting time can indeed be used as an indicator of cow comfort. However, it is important to establish that the major indicator of poor cow comfort comes from changes in the normal pattern for a specific cow, as opposed to deviation from an average resting time in a herd.