

Impact of Lameness on Production and Intake in Holstein Cows

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Summary and Implications

Lameness is a critical issue to the dairy industry due to animal welfare and economic concerns. Daily milk production and dry matter intake (DMI) were monitored in 400 Holstein cows, including 51 that experienced at least one occurrence of lameness. Milk production and DMI decreased by approximately 10.3% and 13.2%, respectively, at the time of treatment for lameness, relative to production and intake levels two weeks prior to treatment. However, both production and DMI returned to pre-treatment levels two weeks after treatment. These results demonstrate that lameness can have a significant impact on milk production, and therefore economic returns to a dairy farm. The results also demonstrate the importance of early treatment for lameness, because cows fully recovered within two weeks of treatment. Finally, managing lame cows to encourage feed intake may help alleviate declines in milk production associated with lameness.

Introduction

Lameness is a costly disease in the dairy industry. The costs associated with lameness include increased veterinary costs (treatments and exams if necessary), increased labor costs to care for the animal, decreased milk production, and in extreme cases loss of the animal either by death or by culling. The effects of lameness on production and non-production traits are not well quantified in US herds. Lameness is a subjective trait, and the decision to treat and even report cases can be vastly different among farms. Additionally, data describing the impacts of lameness on feed intake are particularly limited because most farms lack the capability to collect individual cow intake on a daily basis. Therefore, the objective of this research is to quantify the impact of lameness and mastitis on milk production and dry matter intake (DMI) in lactating Holstein cows at the ISU Dairy.

Materials and Methods

Milk production, feed intake, and health data were collected in 2008 through 2010 on 400 Holstein cows at the ISU Dairy. There were 226 first parity cows, with the remaining 174 cows ranging from parity two to seven. Individual feed intake information was collected with the Calen Broadbent Feeding System from approximately 4 to 150 days in milk. Feed was provided twice daily ad libitum,

and intake was calculated as the difference between the feed provided and feed remaining on a daily basis. DMI was calculated from the intake data based on moisture content of weekly samples of the total mixed ration provided to the cows. Milk production was recorded twice daily (at each milking). Health data were routinely recorded by farm staff. Lameness was defined as an event that affected cow motility and resulted in a treatment (foot trim or medication). Unusual injuries were not included as lameness. Also, cows were excluded if they did not have intake or milk production records for the periods of interest. Milk production and intake were calculated as an average over three days during the following time periods: two weeks prior to the first treatment of the animal (days 13-15 prior to treatment), treatment day (prior 3 days and treatment day), and two weeks after first treatment (days 13-15 post treatment). The final data set included 51 cows. Differences in DMI and milk yield among the time points were determined by using mixed model procedures. Time relative to treatment and parity were fitted as fixed effects, while cow was fitted as a random effect.

Results and Discussion

Cows were reported to be lame for a number of reasons, including: abscesses, foot/hoof rot, and sore feet, with 7, 36, and 4 cows in each category, respectively. Four cows were simply coded as lame. The average day in milk (DIM) at treatment for lameness was 52.65 ± 52.19 days. The high standard deviation indicates that lameness occurred throughout the first half of lactation. Data were not evaluated for the second half of lactation. Lameness had a negative impact on milk production, with a loss of 4.3 kg when comparing production two weeks before treatment with production at treatment. Two weeks after treatment, milk production increased by 4.6 kg, showing cows that are treated for lameness on average make a full recovery (Figure 1). Intake followed the same pattern, with cows eating 2.8 kg less at treatment and showing a 3.9 kg increase in intake two weeks after treatment (Figure 2), again making a full recovery. The decrease in intake most likely reflects the cow's eating behavior, as she will be less likely to walk to the feed bunk if she is lame. Therefore, a decrease in milk production is expected.

Pinpointing when the cow declines and when she recovers in terms of production and intake could lead to a better understanding of the impact of lameness on cow productivity and farm economics. It is clear that lameness causes a decrease in profit due to the significant milk loss compared to when the animal was healthy. Prevention and early treatment practices are therefore crucial for dairy producers.

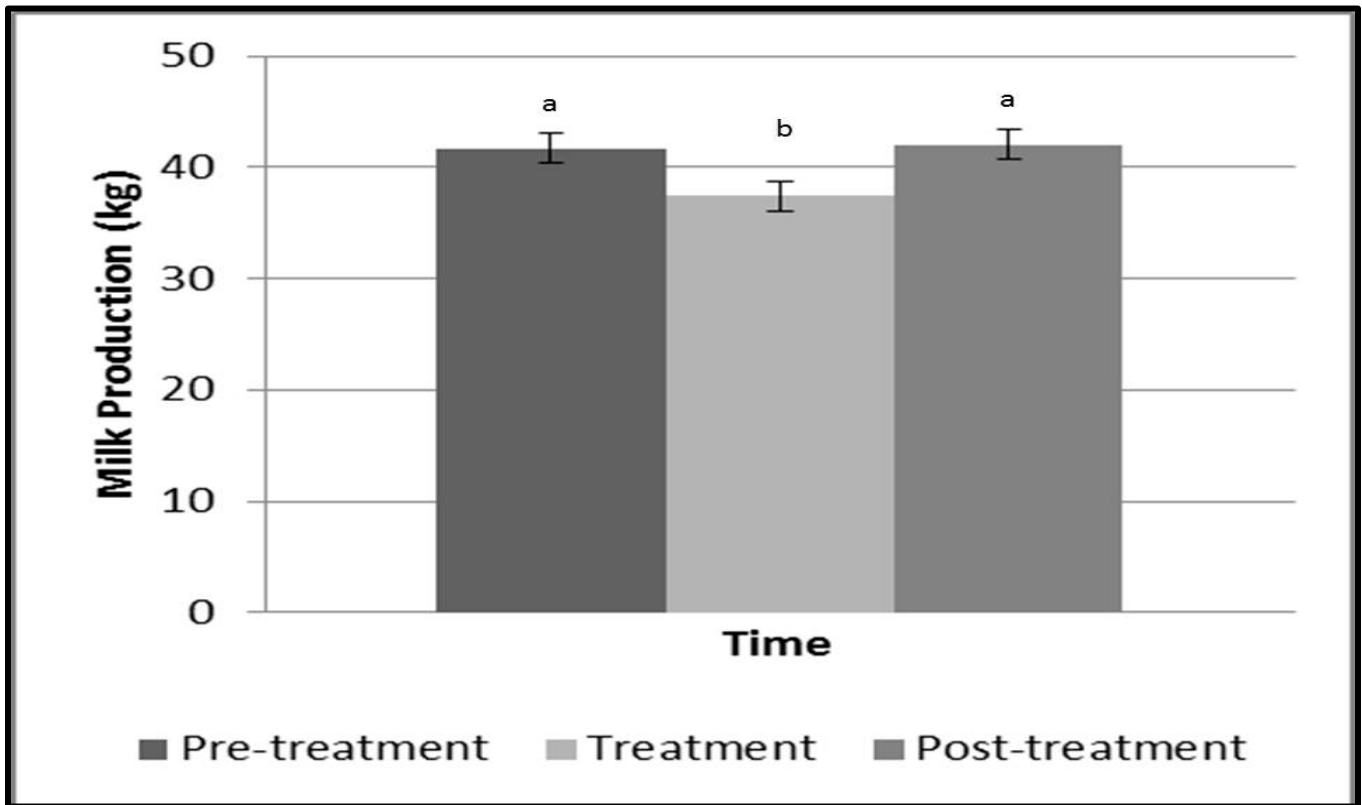


Figure 1. Average milk production 2 weeks before treatment, at treatment, and 2 weeks after treatment for cows diagnosed as lame. Each time point represents the average of 3 days milk production.

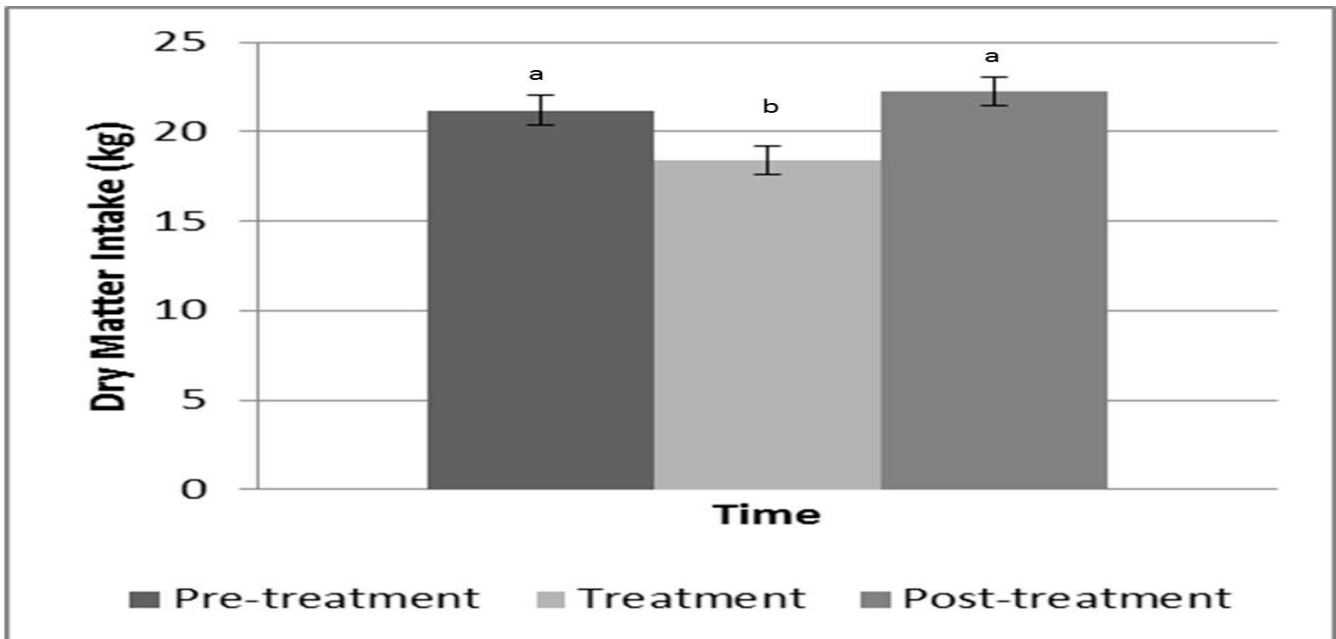


Figure 2. Average DMI 2 weeks before treatment, at treatment, and 2 weeks after treatment for cows diagnosed as lame. Each time point represents the average of 3 days DMI.