

TECHNICAL BULLETIN

DAIRY



WHY DO WE CARE ABOUT RUMINATION? IMPLICATIONS OF INCREASED RUMINATION TIME BY QLF LIQUID SUPPLEMENTS

Recently, we completed two research trials on two large dairy farms in Michigan. Cows were supplemented with a QLF liquid supplement from 21 days before calving to 40 days after calving. Trials ran for 3 months and rumination data was collected on individual cows using rumination collars. After 3 months of trials, cows receiving QLF supplements increased rumination time by 25 min per day on farm A (397 vs. 422 min/day) compared to cows not receiving QLF supplements. On farm B, cows receiving QLF supplements increased rumination time by 20 min per day (466 vs. 486 min/d) compared to cows not receiving QLF supplements during the first 40 days of lactation. Why is rumination important? What are the implications of increased rumination?

What we know about the importance of rumination time is summarized below.

- Cows spend one-third of the day ruminating. Rumination facilitates digestion, particle size reduction, and subsequent passage from the rumen. So, it influences dry matter intake. Rumination also stimulates saliva secretion, which may improve ruminal function.
- The time that cows spend ruminating is controlled by dietary and management factors such as fiber amount, particle size, degree of overcrowding, grouping strategies, and other potential stressors in the management environment.
- Rumination time can be reduced by “non-ideal” environment and management factors.
- Rumination reflects cow health and is highly sensitive to the state of well-being. Cows have reduced rumination time when under acute or chronic stress.
- Rumination time responds to stressors 12 to 48 hours sooner than traditional measures such as elevated body temperature, depressed feed intake, and decreased milk yield.
- Cows prefer to ruminate while lying down: > 90% of rumination occurs in stalls. A recent study reported that a 2% increase in resting was associated with a 7% increase in rumination. On the other hand, management that impairs lying down time also reduces rumination.
- Dominance hierarchy also affects rumination activity. Lower ranked cows ruminated 35% less than higher ranked cows, possibly due to: shorter rumination bouts, lower feed intake by low-ranking cows, and compromised well-being.
- Research showed that cows with greater lying and ruminating times a week before calving have greater DMI and milk yield during the first two weeks after calving. Cows with less rumination before calving tend to have less rumination after calving. Shorter rumination time is associated with increased risk of metabolic disorders.

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- Rumination time (min/d) changes in response to different events: average rumination: 450 to 550 min/d; calving reduces rumination time: -170 to -255 min/d; estrus reduces rumination: -75 min/d; mastitis reduces rumination: -40 to -120 min/d.
- On-farm use of rumination monitoring can be beneficial for: (1) identifying nutritional problems; (2) improving reproductive performance; (3) detecting health problems earlier such as metabolic disorders, mastitis, and lameness; (4) gauging management effectiveness: grouping and stocking density; (5) changing treatment culling decisions: cows can be monitored after treatment to decide whether it is working or not.

Overall, given that rumination is highly sensitive to changes in cow health and comfort, increased rumination time by cows receiving QLF liquid supplements indicates that cows had better cow comfort and health status. This is consistent with the research findings from the two farms where cows receiving QLF during the transition period had dramatically decreased incidence of fresh cow metabolic diseases and increased milk yield. It is also likely that cows receiving QLF supplements had better dry matter intake, and less sorting. All of these positive changes could contribute to increased dairy profitability. In short, monitoring rumination allows for earlier identification of problems and intervention.. Feeding QLF liquid feed supplements is an effective strategy to increase rumination time, an indicator of improved cow health and performance.