dairy cow well-being

Rumination is an innate behavioral need of dairy cattle (Lindstrom and Redbo, 2000), and they exhibit stereotypical behaviors when it is inhibited. When ruminating, whether lying or standing, cows are quiet and relaxed, with heads down and eyelids lowered. Cows prefer to ruminate while lying down (Cooper et al., 2007; Schirmann et al., 2012), with rumination occurring in about 80% of resting bouts. Most rumination occurs at night and during the afternoon. Consequently, poor management that impairs a cow’s lying time may also reduce rumination. The cow’s favored resting posture is sternal recumbency with left-side laterality (55-60% left-side preference). This combination of left-side laterality and upright posture is thought to optimize the positioning of the rumen within the body for the most efficient rumination (Grant et al., 1990; Albright and Arave, 1997).

Total sleep time for cattle is short, and rumination provides the physiological rest and rejuvenation of sleep (Ruckebusch, 1972; Ewbank, 1978). Cattle experience about three hours per day of non-rapid eye movement (NREM) sleep and 45 minutes per day of REM sleep (Ternman et al., 2012). The electroencephalogram patterns recorded during rumination are similar to sleep or somnolence (Bell, 1960).

Rumination is closely associated with drowsiness and can even occur when the cow progresses into non-REM sleep. There may, in fact, be a behavioral continuum between rumination and sleep in ruminants.

Sufficient sleep is critical for both metabolic and immune functions, and the relationships among rumination, resting and sleep are critical for the health and well-being of dairy cows. Increasingly, research is focusing on this important and overlooked aspect of rumination biology.

The Bottom Line
Rumination is highly sensitive to changes in dietary physically effective neutral detergent fiber and fiber digestibility, cow health and well-being. Its use as a routine on-farm monitoring tool is expected to grow, since this will allow for earlier identification of problems and more timely intervention.

However, in order to fully leverage the value of rumination monitoring, its role in maintaining cow health and well-being needs to be fully understood.

References
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