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Overstocking and Cow Response

I have recently been hearing from dairymen that they are overstocked in some fresh pens when I ask questions about cow behavior in those pens. The behavior I notice are cows standing in the feed lanes, not lying down when they should be and some thin cows even though I know the ration should be adequate. In my mind, if there is not enough area for all cows to eat then that is a problem. Today's feed becomes tomorrow's milk. Less feed today means less milk tomorrow. I have embarked on some research into overstocking in dairy pens and possible effects on cows. There are some behaviors and rumen physiology issues at play that seem to get overlooked when making cow move decisions. The summarized discussion below is the compilation of many research articles published in the last 5 years.

Most overstocking decisions are primarily based on profitability. More cows to milk equates to more milk being produced. The normal assumption is that there is feed available at the bunk 24 hours a day so even the most timid cows will eventually have an opportunity to get to the bunk and consume feed. There is a published relationship between stocking density, lying time, and profit (\$/stall or pen/year). Profit was maximized at around 120% using average costs and milk prices in the U.S. The profitability was driven by revenue gained by increasing production by pen or stall, the cost of increasing or decreasing production per cow, variable costs, and milk price. However, overstocking reduces the cow's ability to practice natural and healthy behaviors, which has an effect on cow well being which determines milk production per cow. Higher stocking densities reduce feeding time and increase aggression at the bunk, may reduce rumination time, and reduce lying time that is critical to the rumination process. Overstocking has been shown to increase the rate of feed consumption and meal size. All of these factors would lead to an assumption that overstocking may negatively affect rumen pH.

Nutrition models used to formulate dairy cow rations assume that cows have ad libitum access to feed and are not limited in their access to the TMR. These nutrition models are also formulating for a specific range of intake. If the intake is affected either direction, then the model will be over or underfeeding milk cows. Several studies have been conducted which evaluated cow behavior as a result of overstocking. Lying time was consistently decreased in all experiments. Lying time is critical for adequate cud chewing, rumination, and buffer production. As a result, in experiments where lying time was significantly reduced, there was an increased incidence of ruminal acidosis and the severity had a linear relationship with degree of overstocking. The higher the stocking density, the more severe the acidosis. The more timid cows in the overstock pens were required to spend more time standing in the alley waiting for an open headlock. When those cows got to the bunk, they consumed feed faster and spent less time at the bunk. The theory is that those timid cows eat faster because they are constantly looking over their shoulder for the more aggressive cows to return so they eat quicker and get away from the bunk. Then

when the stalls are overstocked, there is not anywhere for them to lie down after they eat. The inability to ruminate normally was shown to decrease rumen pH and therefore increased incidence of fresh cow metabolic disorders.

Another recent article on heifers realized the same behavioral changes. The more overstocked the heifers were, the more time spent standing. An interesting finding in the heifer study was a noticed increase in animals spending more time eating after 10 p.m. at night. The assumption was that was the only time those timid heifers could safely get to the bunk

Every dairy must make their own decisions on stocking density and profitability of the dairy. There are times when short term over crowding is inevitable. For those times where there is a choice, dairymen would be wise to avoid high degrees of overcrowding if they want to increase their bottom line.