Production: Limited or Driven by Feed Bunk Management

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Introduction

Bunk management is a vigorously debated subject in the cattle feeding business. That is where my experience lies. I will readily admit that I do not fully understand the nuances of feeding dairy cows. My goal is to share ideas and principles we have learned while finishing cattle because these principles have some application whenever ruminants are being fed to support high levels of production.

The core of concern when managing bunks in a feedlot is controlling acidosis. High concentrations of highly fermentable carbohydrate create the risk. Ruminants were designed to eat until physical fill triggers satiety. Our diets no longer work within the scope of that intake regulation system. So, we reduce bunkspace to increase competition for feed. We feed 2 to 4 times daily to ensure cattle don't experience prolonged hunger and to limit the amount of feed available at any one time. Monensin, which tends to depress intake or at least the rate of consumption (Birkelo and Lounsbery, 1992) is being used again at higher concentrations to regulate consumption rates and intake variability (Stock and Britton, 1993).

We also manage intake simply by restricting variability in feed deliveries. The most dramatic system involves programmed feeding. In this system feed deliveries are intentionally set at some point less than *ad libitum*. A summary of these systems (Pritchard, 1995) shows that they generally allow equal rate of gain while requiring less feed. In part, this efficiency response may be due simply to reductions in the variability of daily feed deliveries and subsequent variation of Dry Matter Intake (DMI). Galyean *et al* (1992) observed that it was variability of deliveries that was crucial when limit feeding. Bierman and Pritchard (1997) noted that stable feed delivery rates enhanced efficiency when not using programmed feeding.

Application to Dairy Farms

What does this have to do with feeding the lactating dairy cows? Roughage levels are high enough to circumvent the problems associated with feeding >90% concentrate diets. Even if roughage concentrations were reduced, we all know that dairy calves can be fed on self-feeders. Dairy cattle, including cows, are inherently different. I often hear those comments, but I don't believe any of them. There are no data verifying that dairy calves are more suited to self-feeders than are beef cattle. My anecdotal interpretation is that on a dairy farm where feeder cattle have a much lower priority than milking, calving or farming, the self-feeder is no more harmful than the occasional lack of attention that occurs when bunk feeding. And as far as cow diets are concerned, I understand that varying degrees of laminitis are a chronic problem on many dairies. It seems fair to attribute some of them to acidosis. It is easy to do this if you consider the total acid load lactating cows are attempting to accommodate. Lactation diets contain substantial roughage levels, but they are generally highly digestible roughages. Total DMI may be 4.5 X maintenance. Consequently, total Total Digestible Nutrients (TDN) intake and therefore total ruminal acid production, become quite high. Subclinical acidosis becomes a very probable concern.

One other concern I have when addressing bunk management deals with whether the cattle are actually consuming the diet I have formulated. There are obvious risks like mixing errors (amounts or sequence) or fluctuations in feed composition. In high moisture feeds, the DM content is the most critical value. After a rain, the DM content of the wet corn gluten feed pile and bunker silage can drop. Without a correction, the corn content of the diet is dramatically increased. In an *ad libitum* feeding system of mixed diets I have just created an outbreak of digestive upset.

A more enigmatic concern relates to what cattle are actually eating. Under grazing conditions we know that cattle are selective eaters. Generally, the extrusia collected from the esophagus is of higher nutritive value than is found in a representative clip of the pasture. It has been my personal observation that the same thing occurs in the feedlot. Limit fed cattle take large indis-

criminate bites of mixed feed. Cattle that have unlimited access to feed, nose through it and separate ingredients while eating. We have recognized that feed delivery management dictates whether or not cattle sort cobs out of corn silage diets. When cobs or other feed components are sorted, is it because a few animals refuse to eat them or because all animals reject 10% of them? I have not learned the answer to that question, but I do know that residual cobs mean the formulated diet and consumed diet are no longer equal. You can quickly ascertain the impact of milkfat variation among individual cows by virtue of altered eNDF intake. I have a concern that feed tossing creates similar problems. It is an excellent technique for separating feed ingredients when a sieve is not available.

Major Principles of Feeding Management

To manage feed deliveries we have several concerns. Henry and Morrison (1923) note that the feeding schedule cannot be altered by more than 15 minutes without having an adverse effect on cattle. The greater the variation, the greater the insult to the animal. I think this is because cattle are creatures of habit. It we recognize this and cultivate good eating habits, we may improve feed utilization.

This leads in part to the concern that as an ecosystem, the rumen functions best when variation is minimized. Substrate type, availability and quantity and end product removal rates must be in synchrony. Well mixed diets consumed at regular intervals are needed to achieve optimal rumen performance. Peak eating episodes occur near dawn and dusk (Gonyou and Stricklin, 1984). If feed is not available at these times cattle may become overly aggressive when feed is finally delivered. Under these circumstances, allocation of feed amounts among individuals will likely be compromised. When feeding cattle once daily we (Knutsen *et al,* 1994) have observed increased efficiency by feeding cattle at 1630 h than at 0730 h. In part that may be caused by the fact that afternoon feeding causes feed to be available at 0530 h when cattle begin seeking feed.

A final principle to recognize is that in mammals the default mode is to eat. Satiety signals serve to down regulate appetite. When DMI is lower than expected we should be looking for unwarranted satiety signals. We are trying to avoid intake depression which is very different from the common perception that we are trying to stimulate appetite.

Conclusion

I have come to learn that there is no single best way to feed cattle. I work with the four principles outlined here and then try to find the most cost effective approach that can be implemented for each operation. Generally there is a need to address employee and/or management philosophies. Sometimes we simply need to change the person making the feed calls since, in spite of our technological tools there remains an element of art. In feedlot cattle there is rarely a difference in production rates. The results of improved bunk management are typically manifested as changes in production efficiency. Consequently, improvements in bunk management are more appreciated in operations that are aware of and concerned about improving efficiency rates.

References

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