

Optimizing Feeding Management

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The largest expense on your dairy operation centers around feeding the animals. Therefore, your bottom line benefits from every effort to manage all areas of the feeding operation. It can be a complex task to manage because of its many moving parts. The goals need to be kept and tracked daily to make sure every action helps achieve the goal. Measurable results indicate the state of the feeding operation and your progress toward the goal. Once you are obtaining the desired results, then you can evaluate the efficiency of getting the job done.

Keys to Optimizing Feeding Management

Once we have set our protocols in place to get the feeding operation consistent for the animals, then the management of the process has to be addressed to allow the system to operate as efficiently and profitable as possible. For efficiency and profitability, the main areas that need to be monitored are implement an efficient feeding schedule, maintaining equipment, properly designing/remodeling the feed center, managing shrink, implementing a frequent push-up schedule, and having a monitoring system in place. Having check points in each of these areas allows you to better manage this large expense line item of your business.

Efficient Feeding Schedule. Feeding schedules are often designed around the daily milking schedule for the operation. That can work efficiently but most of the time it doesn't. Many times, feeding equipment are waiting on the parlor before delivering feed. This is costly to the feeding operation having a piece of equipment sitting and waiting. If the mixer capacity, pen counts, and first milking of the day can be obtained then an efficient feeding schedule can be outlined for each operation that saves money plus gets the cows fed relatively quick. The feeding schedule should maximize every load to deliver as many full loads as possible. When outlining the schedule, the goal should be to follow the parlor schedule on the initial feeding of the day, then just feed cows to get them fed as efficiently as possible keeping in mind to feed cows 1 – 1.5 hours ahead of the parlor and not as they are prepared to go to the parlor.

Maintain Equipment. All mixer wagons can mix feed properly but, they all have to be maintained to be capable of delivering a TMR that is consistent. Just because feed is loaded in the mixer wagon and it mixes it, doesn't mean it is mixing well. Mixers must be properly maintained to allow the cows the opportunity to eat a consistent diet, so they can be healthy and profitable. Worn mixer parts can have a dramatic effect on animal performance and health. Some of the key components of mixers that need to be monitored are kicker plates, if the mixer has them, tolerances of the leading edge from the floor and auger from the wall. Two things that is not as much wear but are critical to obtaining a consistent mix is the speed of the auger and mixing time of the ration. These have to be consistent and monitored closely.

Shrink. Shrink can be one of the largest expenses on an operation. Dr. Greg Bethard (2014) says that shrink is the fourth or fifth most significant expense on operations today. This expense often goes unnoticed because operations do not have systems and protocols in place to measure or monitor shrink. Operations today need to closely monitor every aspect of their operation in order to maintain a profitable business. Shrink occurs not only in feed ingredients but also in wasted or lost time, fuel and energy, use of other unnecessary inputs, etc.

Some shrink losses are typically considered as a cost of doing business. However, what frequently starts out as being an abnormal occurrence becomes commonplace and is easily overlooked. This seems to be common on farms without shrink management. However, this cost of doing business can result in the extreme losses for the farm. For example, for an operation with a herd size of 1,000 head, where feed cost is \$6.50 per cow per day and shrink is 8%, the total yearly cost of shrink for the herd is \$189,800.00. This degree of loss can greatly impact profitability.

Dairy producers often go to great lengths to purchase ingredients at the best price possible in order to save money. However, when the ingredients arrive on the farm and go unmanaged, the losses due to shrink often are far greater than the initial savings when inputs are purchased. Table 2 illustrates the cost of shrink on different ingredients and increasing shrink levels. In order to truly be profitable, both a lower purchase price of ingredients and a decrease in shrink loss can help the operation maximize profitability.

Table 2. Common observed shrink values on dairy operations (Greene, 2018).^{1,2}

Ingredient	Range, %
Corn Silage	7 - 16
Haylage	9 - 18
Flat Storage Dry Ingredients	1.5 - 7
Bulky Dry Ingredients (whole cottonseed)	3.5 - 18
Upright/Overhead Storage	1.5 - 7
Wet Byproducts	12 - 20
Average Observed (all Ingredients)	5 - 7

¹Shrink loss for each ingredient was observed on 21 dairy farms.

²Values were collected over the course of a year on farms by D. Greene.

There are many areas on an operation where shrink can occur. The four main areas are: (1) in the forage area (before, during and after harvest); (2) in the feed center; (3) during loading and mixing of the TMR; and (4) in the barn or feeding areas during and after feed delivery.

Determining where shrink is occurring on your operation is key in order to be able to manage it. A total shrink management program should be implemented so that the resources spent can express optimum return. Goals and written protocols need to be in place to minimize shrink. Everyone from the management team to the feeders need to follow the set protocols and be committed to reach the set goals. A checklist system is a good tool to help monitor and manage the four major areas of shrink.

Managing the efficiency and actions around the feed center. Activities associated with the feed center are often very costly and inefficient. Every movement needs to be thought out and implemented into a process approach to feeding the animals. Wasted time and movement is money lost, so feed center activities need to be monitored and managed. Jason Karszes (2016) developed a model to calculate the cost of making, mixing, and delivering TMR on an operation. It allows the producer to breakdown the costs of different areas of the feeding operation. Table 3. illustrates the cost variation to make, mix, and deliver a ton of as-fed TMR on 41 herds across the U.S.

Table 3. Results of 41 herd study on feed center costs (Greene, 2018)

Expense per as-fed ton	Low	High	Average
Labor	\$0.92	\$3.51	\$2.58
Loading	\$0.99	\$3.77	\$2.11
Mixing & Delivery	\$1.37	\$3.74	\$1.87
Total Cost of Making, Mixing, & Delivering	\$3.42	\$10.15	\$6.48

It is important to understand the costs associated with the feeding operation. There is a lot of opportunity to have a leak in the "profitability bucket" if you are not measuring and managing these costs. Minutes cost money. For example, if you have a 200-horsepower tractor pulling a 1,100-cubic foot mixer, the typical cost to operate those two pieces of equipment is about \$72.50 per hour. If you make 10 loads of TMR per day and you can change your process and save 10 minutes per load per day, that is an annual savings of \$44,092.00. Similar savings can be obtained during the loading process. The bucket size needs to be correctly matched to the loads you are making. A maximum of two maybe three buckets of the largest ingredient is more efficient.

Implement a Frequent Push-up Protocol. Feed push-up is often the easiest way to gain 2 – 3 pounds of milk production plus potentially increase feed efficiency. It is commonly seen that when feed is delivered, or feed is pushed up, occupancy at the feed bunk occurs. The more times feed can be pushed-up, the more frequent smaller meals the cows will eat. When this happens, cows are more efficient and have less health issues. The goal for pushing up feed is every hour. After feed is delivered, it needs to be pushed up thirty minutes post feeding because there is a high occupancy at feeding times. It also needs to be pushed up prior to each delivery so no feed is run over by the mixer.

Feed also needs to be pushed and rolled not just pushed up. As cows eat they try to sort. To reduce sorting the feed needs to be pushed and rolled to remix the feed in the bunk. If it is pushed only, then the grain portion of the ration that was being sorted is still going to be on the bottom where it is easy for the cows to find.

Properly Designed/Reorganized Feed Center. Feed center layout and design also can save you more or cost you more, depending on your operation. There are many different ways to build a feed center that will work. You have to decide what type best fits your management style. A fully automated system may be what is best suited to your management capabilities.

Alternatively, you may want to have a feed center that has little to no mechanization other than a loader and a mixer. Another way may be to have a combination of these two systems in order to optimize your particular resources and management system.

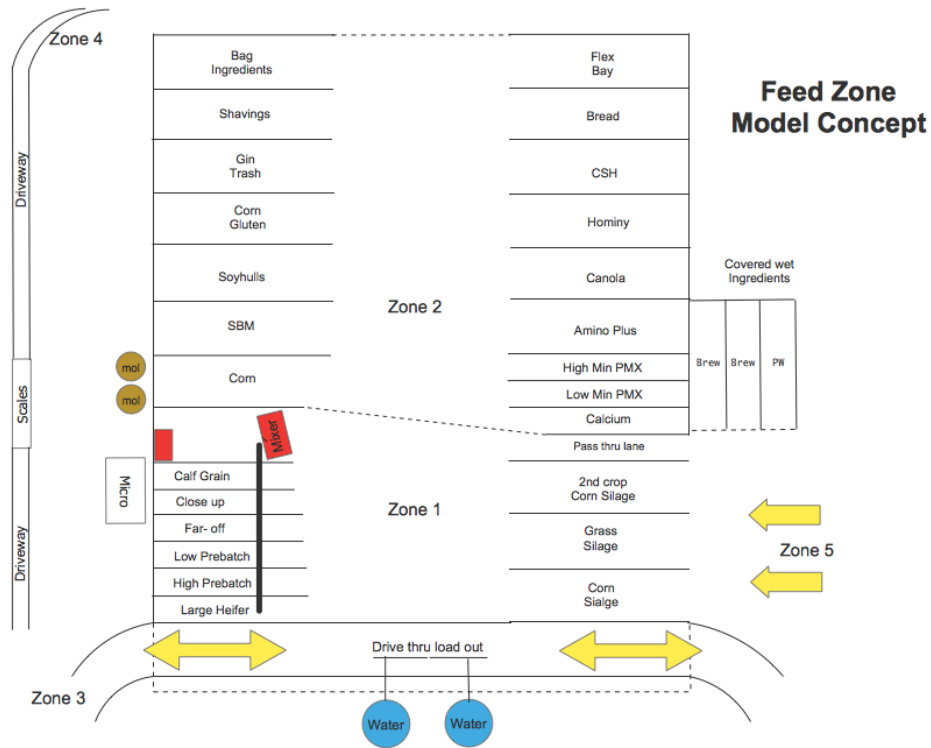
The feed center is a critical part of your feeding operation. In looking to improve, you should research layout and designs, go visit as many of them as possible, and then watch them operate to see what system is best for you. When designing or remodeling a feed center always design it based on the Feed Zone Model Concept.

The Feed Zone Model Concept. This model helps manage the movements and actions around the feed center area to help increase efficiency, safety, organization, and biosecurity. In the Feed Zone Model Concept, there are five traffic zones that have to be managed:

- Zone 1 – the TMR loading zone in the feed center area. No other traffic should be in this area except for the loader making TMR loads. This zone is critical to keeping animals fed on a timely fashion.
- Zone 2 – the unloading zone for off-farm deliveries in the feed center area. Trucks should be able to come and go without interfering with making loads of TMR. The loader may be in this area during specific times making dry grain only premixes or pre-batches but not on every load.
- Zone 3 – the on-farm delivery traffic area of TMR loads outside the feed center. There should be minimal to no traffic crossing this pattern between the feed center and the feeding area.
- Zone 4 – the off-farm delivery traffic area. This pattern should be from off the public highway, across the platform scales to the feed center, and return to the scales and public highway.
- Zone 5 – the on-farm traffic staging forages at the feed center. This pattern should not interfere with making TMR loads

The design of your feed center has a major impact on the efficiency of the feeding operation. It must fit the management style of your operation and requires a lot of research and thought. Utilizing the Feed Zone Model Concept helps you design a more efficient feed center, where improvements in performance can be measured through a Feed Center Cost Analysis. The Feed Zone Model Concept can also be used when remodeling an existing facility. Keeping the high traffic feed center area organized will increase safety and efficiency.

Figure 1. A typical feed center layout illustrating the Feed Zone Model Concept



Summary

The feeding operation is a complete system that can improve the performance of dairy animals and profitability. The system consists of everything related to feeding -- from balancing the diets, making and delivering the TMR, feed ingredient storage, the feed center, and through every stage to the feeding area. To objectively measure changes in the operation, it must have a monitoring system in place to track the key performance indicators along with all other areas. If your feeding system is designed, monitored, and managed well, you can realize greater profit from your feeding operation investment.