

Wasted feed means wasted dollars

Feed shrink and lack of inventory control are a big cause of lost income. We lose because the feed already is paid for and because the cows aren't fed as well.

FEEED is the single largest operating expense on dairy farms. Annual feed costs per milking cow can run \$1,000 to \$1,200 or \$100,000 to \$120,000 for each 100 head. Despite this fact, few dairies closely track feeding practices and feed inventories and closely monitor shrink. Shrink is any loss of feed between harvest or purchase and what the cow actually consumes.

Shrink on individual ingredients has been reported to range from 0.5 percent to as much as 20. Shrink of forage often is well over 20 percent.

Worth worrying about . . .

Assuming annual feed cost of \$1,100 per cow, reducing overall feed shrink by just 3 percent would boost margins by \$3,300 in a 100-cow herd; \$16,500 in a 500-cow operation. In some cases, people have been able to reduce shrink 5 to 8 percent. That savings amounts to \$27,500 to \$44,000 for a 500-cow dairy.

The bottom line is that, as dairies get larger, there's big dollars at stake in feed shrink and inventory control. And these figures only represent the income "recouped" from lost feed. You'll also gain by having a more consistent feeding program which means better cow health and improved feed efficiency.

There are several additional reasons to develop and implement a plan to reduce shrink:

- The investment in the feed already has been made.
- It's relatively easy to make step-by-step improvements.
- You'll have better inventory control, feed forecasting, purchasing, and contracting.
- Rations will be more consistent and productive each day.
- You'll have a better handle on dry matter intakes.
- Determining "income-over-feed-cost" will be easier.
- You'll have better on-farm biosecurity and cleanliness.

We all know feed shrink occurs. Just look at any bunker, commodity bay, or row of round bales. The key is developing a plan that includes monitoring and tracking of feed shrink, mixing rates, and inventories. The paybacks can be large.

Try to control . . .

Since we can't eliminate feed shrink completely, we should focus on controlling it. Most dairies can live with average shrinks ranging from 2 to 5 percent. However, shrink often reaches double digits. That's when it really hurts you financially.

There are several major "control points." These include harvesting, storage, handling, mixing, feeding, processing, delivery, and any discarded feed. Within each of these areas there are several factors such as wind losses, birds, rodents, tires and tracking feed, seepage and silo runoff, bunk disappearance due to tossing of feed, hot or spoiled feed, moisture loss, mixing errors, and scale inaccuracy. A real challenge is that much of our feed shrink is almost invisible during daily activities.

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Consider shrink when choosing ingredients, particularly protein, energy, and mineral sources. The higher the cost per pound, the more costly the shrink. Dry ingredients with small particle size and light bulk density are more susceptible to wind losses. Soy hulls and malt sprouts might be examples. And real wet ingredients, such as wet brewers' grains, may have higher losses due to feed deterioration and runoff.

Obviously, placing ingredients in outdoor piles offers the greatest potential for shrink, especially if left uncovered. Losses in excess of 20 percent would not be surprising under these conditions.

What about using an upright bin for a protein blend versus uncovered flat storage. Two factors enter the decision. First, there's the value of any feed savings through reduced shrink with the upright bin. Second, there's the opportunity cost of having cows consume a more consistent and accurate ration due to less variation in mixing errors with auger loading versus a bucket. This opportunity cost is tough to measure and evaluate, but it must be considered.

Pay for bin easily . . .

Let's say a 500-cow dairy feeds 4 pounds of protein blend per cow daily, at an average cost of \$270 per ton. The annual cost of the protein would be \$98,550. Suppose you cut shrink of the protein blend by 3 percent by switching from uncovered, flat storage to an upright bin. Recouped protein blend value, otherwise lost to shrink, would be \$2,956 per year. In this case, buying an upright bin might make good sense.

Open-fronted commodity sheds can be managed to keep shrink below 5 percent. But you need proper overhang and ample concrete apron in front of storage bays to minimize weather exposure and to facilitate loading and handling.

Commodity sheds tend to work best for higher inclusion ingredients such as whole cottonseed, baled hay, or others fed at 2 to 3 pounds or more per head daily. Blends containing higher levels of liquid fat also often are stored on flat storage for ease of handling.

Shrink in upright bins typically can be limited to 1 to 2 percent. And weighing and mixing tends to be more accurate. This may account for even greater savings over and above actual feed shrink caused by wind loss, tire tracking, birds, and so on.

Bins often are available through "lease-to-buy" and bin placement programs offered by feed companies and others as an incentive to purchase preblended ingredients and other feed products.

But upright bins do have slower feedout rates, possible feed bridging, ingredient limitations such as high fat levels, and down time due to motor failures or lightning strikes.

Having both bins and flat storage often is best. Put higher inclusion rate ingredients in flat storage while storing higher cost ingredients in upright bins. Creating a feed center, with multiple types of storage and where ingredients are all stored within short distances and easy access of the forages, can improve feeding effi-



COMMODITY SHEDS with paved aprons and ample overhang make it easier to control shrink.

ciency and mixing accuracy significantly.

Two things happen to create forage shrink. You lose it as it moves through different handling and storage processes. And there is microbial deterioration and fermentation dry matter losses. It especially is easy to underestimate microbial deterioration losses. In fact, there may be dry matter losses of 5 to 20 percent before you ever see visual evidence of molds.

Actual forage handling losses and shrink depend on harvest and storage methods. Drs. Brian Holmes and Richard Muck in Wisconsin indicate that total forage dry matter losses can range from about 10 to 50 percent, including the losses associated with filling, seepage, fermentation gasses, surface spoilage, and feedout.

Variation in density . . .

That Wisconsin team clearly showed there was a large variation in bunker silo compaction density for both hay crop and corn silages that contributed to forage shrink. (See the table.) Our goals should be dry densities of at least 15 pounds per cubic foot for both hay silage and corn silage.

How well are we packing bunkers*				
Characteristic	Hay crop silage (87 bunkers)		Corn silage (81 bunkers)	
	Avg.	Range	Avg.	Range
Dry matter, %	42	24-67	34	25-46
Wet density, lbs./ft ³	37	13-61	43	23-60
Dry density, lbs./ft ³	14.8	6.6-27.1	14.5	7.8-23.6
Avg. particle size, in.	0.46	0.27-1.23	0.43	0.28-0.68

* Holmes and Muck, University of Wisconsin and U.S. Dairy Forage Research Center

Other ways to control feed shrink include:

- Avoid feeding in an elevated "H-bunk" that encourages feed throwing.
- Periodically check load cells for accuracy.
- Utilize batch mixing charts with conversions to account for moisture variations.
- Establish mixing protocol and sequencing based on specific ingredients.
- Control rodents and wild animals in and around silo bags and other storage.
- Have all deliveries of purchased feeds weighed.
- Closely manage forage feedout to maximize aerobic stability of the TMR in the bunk. This will minimize refusals due to heating or secondary fermentation.
- Record receiving dates and tonnage on all incoming ingredients.

Give the responsibility of inventory control and minimizing shrink to a specific person. Usually, it's the feeder. Have it be part of the job description. Provide ongoing training for that person.

Develop an organized, yet simple, monitoring program that will be embraced by the feeder, nutritionist, veterinarian, ag lender or accountant, and owners and managers. Recognize the significant costs associated with shrink. In most cases, investment and changes in storage facilities and bins along with feed inventory software often are good investments with relatively quick returns.