

Quality Control in Your Commodity Program

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Buying and feeding commodity feeds is an effective way to cut costs on today's dairy farms. Surveys show even small producers can benefit from the cost savings of handling and mixing grains and byproducts on the dairy. However, this cost saving technique places the responsibility of feed quality control squarely on the dairy manager's shoulders.

This presentation will review some of the basics of commodity feeding and then talk about some emerging issues in controlling quality of feeds on the dairy.

To be successful when feeding commodities the dairy manager needs a reliable source of the basic commodities in the dairy ration. A dependable broker can assure a regular supply of feeds at a fair price. A broker can also help by locating commodities of consistent quality. While forward contracting at harvest can help lower the overall annual cost of a commodity, a broker or commodity feeder doing his or her own buying is not going to beat the market often. The savings comes in getting good quality feeds at a wholesale price. Locking in the price can help a manager better determine the cost of production for a period. This will help with wiser cash management, culling decisions, forward pricing of milk, and so on.

There are a wide range in types and sizes of commodity storage and receiving facilities. Commodity feeders find the following characteristics most successful in a commodity storage barn:

- 14' x 30' floor level bins sloped outward so rain or snow melt doesn't flow into the storage bays.
- Floors are poured after walls so seams go down to the base material, not across to the adjacent bay. This makes cleaning bays easier between loads.
- The apron at the open ends of the bins slopes away from storage again to prevent rainfall from entering the storage and to help in cleaning the slab.
- The barn will have two more bins than you need for your regular feeds. This allows you to rotate feeds, clean bins between loads, and pre-mix the commodities if desired.
- Bagged mineral/supplement storage that is adjacent to the barn, but not in an expensive commodity bin. A shed roof with a dry floor is adequate for palletted sacked feeds.
- More commodity barns may include a bin for dry rolling or processing grain and many now include a

small dump chute with an elevator and distribution leg for unloading truck deliveries into the appropriate bins.

Besides the cost of building a commodity barn, surveys have determined some of the ongoing costs of farm mixing commodities. Obviously, cost will vary farm to farm, but surveys show the labor involved in taking delivery of feeds, loading them into the appropriate bins, loading and mixing feeds will add about \$2 per ton of mixed feeds over the prorata cost of feed ingredients. In addition, feed spillage, refusal, and other feed disappearance (shrink) will add another \$2 per ton of finished feed. Don't ignore or underestimate shrink as a cost. By controlling spillage and feed refusal, a manager can save some costs.

Commodity feeding also places some other responsibilities on the dairy manager when compared to buying mixed feeds from a processor. It pays a dairy manager to have truck scales on the farm or nearby available 24 hours per day. Loads arrive with no weigh tickets and it becomes your only way of knowing the delivery amount. Deliveries can also be delayed through weather or breakdowns so managers must plan their supply in advance. There are also seasonal shortages like during the holidays at the end of the year and when feeds like beet pulp are out of stock.

Commodity feeders are unanimous in reporting the need for qualified assistance in planning feed needs and sources and in formulating rations for most efficient production. Training and experience seem to be equally important. A broker may help with market planning, but a good nutrition consultant is where feed and ration planning starts. Your consultant can help you monitor feed quality and how it relates to animal performance and health as well. However, the day to day quality control falls on the dairy manager.

Assuring Feed Quality

There are many aspects of feed quality. Most can be controlled by the dairy manager, but take regular attention.

For high dry matter intake, feed palatability is a primary concern. Buying fresh commodities that are free of weather damage and foreign materials is essential. Be sure to monitor characteristics of pre-farm processing quality along with over all quality. For example, your nutrition consultant can help evaluate the bushel weight or flake thickness on steam flaked grain. The quality of steam flaking has direct relationship to energy digestibility and ultimately to milk production.

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All feeds vary in nutrient content. Growing conditions, varieties, harvesting, and other handling all affect the actual feed value of commodities. The California chapter of the American Registry of Professional Animal Scientists (ARPAS) commissioned a study of the variability of some common California by-product feeds. The study reported some interesting facts important to dairy managers and nutrition consultants. Most major nutrient components have small to moderate variation within a feed. However, the variation is greater in high moisture feeds. For example, in the survey almond hulls ranged from 24 to 32% acid detergent nitrogen (ADF) but some were as high as 35% and as low as 19%. The National Research Council (NRC) reports an average 28% ADF content. Protein variation tended to be smaller. The analyses from one laboratory for crude protein in canola meal ranged from 39 to 41% and averaged 40%.

The study also looked at mineral content and found them much more variable. Molasses samples ranged from 123 to 277 parts per million (ppm) iron and 4 to 77 ppm of zinc. Wheat mill run samples varied from 2 to 153 ppm in copper content. Many of the samples were near the average, but it shows the by-products can make formulating the mineral component of the ration more difficult. The authors of the paper caution that while some of the variations seem quite large, it is impossible to predict how these variations influence actual production. Dairy managers seem successful in using by-product to support high production in spite of variable nutrient content.

Another important quality control concern is the source of minerals in a vitamin/mineral pre-mix delivered to the farm. Certainly, a mineral product can be formulated to contain the levels of minerals needed to balance your ration. However, mineral availability to the animal depends on the chemical source of the mineral. For example, oxides of minerals tend to be less available than sulfates of the same minerals. Organic mineral compounds are also usually more absorbable and stable in mixes. You need to talk with your mineral supplier about quality of mineral mixes as well as just the content of minerals. A good rule of thumb: If your mineral mix costs less than the quotes from other mineral mix suppliers, you better check its quality.

Contamination of Commodities

What seems to be a new concern is contamination of feed commodities by spoilage or disease-causing bacteria. Actually, bacterial contamination surveys of feed ingredients have been done for about thirty years. Larger studies

with more than 100 samples tested have shown 3 to 30% commodity samples positive for Salmonella bacteria.

Salmonella can cause human and animal disease so it's a concern for livestock producers and public health officials.

Since some of the contamination studies only looked at high protein feeds and none had serotyped the bacteria or determined its resistance to antibiotics, Oregon State University scientists decided to look at feed contamination on Oregon dairies. The study, completed in the summer of 2000, sampled 50 feed piles over a six-week period on 12 different dairy farms. We found 42% of samples were contaminated with Salmonella. The contamination occurred on all feeds, even whole cottonseed and pelleted feeds. It was surprising to find bacteria on very dry, low nutrient content feeds like grass seed screenings.

Also surprising was the tendency for the contamination rate to increase over time. When the same piles were sampled over a two week period, the contamination rate went up to 60%. It appears some of the Salmonella contamination is occurring on the farm and that relatively low levels can increase even during a short feed-out period.

It was also alarming to learn that of the Salmonella found in the feeds 62% of the isolates were resistant to ampicillin, but only 10% to tetracycline. We expected some resistance to tetracycline due to low level feeding of antibiotics in calves and heifers. However, the number of isolates resistant to tetracycline was relatively low compared to less commonly used dairy antibiotics and to some drugs not used in animal medicine. It appears some of the contamination is also coming from off the farm. More research will be done to identify more clearly the source of this feed contamination and whether it is contributing to disease on the farm.

We have talked about the characteristics of commodity feeding storage and purchase that will keep your cows healthy, eating well, and producing lots of milk, but don't forget to monitor the cost/nutrient in your feeds. Knowing the quality and nutrient content is important and so is the cost per pound of energy, protein, fiber, and minerals. Nothing can replace testing feeds. Successful managers test ingredients monthly and the total mixed ration once a month.

What Can You Do?

A good quality assurance program for your feed commodities should include:

Monitor for visible contaminants — Inspect loads of feed at delivery for junk, visible mold or spoilage, and heat or processing damage.

Monitor for consistency — If feeds are processed prior to delivery, check the quality of processing and the overall quality of ingredients used. Again this is best done right at delivery of the product. Record weights and delivery times. Watch your farm processing, too. Mix grains, small ingredients, silages, then hay to keep fiber length. Watch group intakes daily and at each push up to get early warnings of problems. Just like you want your feed ingredients of consistent quality, the cow wants her meal of consistent quality. Make feed changes rare and when you have to, do it gradually.

Use clean equipment — Never allow employees to move manure or dead animals with feed equipment and then feed cows. Even bedding or general yard cleanup in feed equipment requires a thorough cleaning before using equipment to handle feed ingredients.

Be aware of unseen contaminants — Mold, toxins, and bacteria can contaminate feed without tipping you off. You will need to test suspicious feed sources occasionally. Develop a list of testing laboratories in your area now.

Rotate stocks — To maintain freshness and to reduce the growth of mold or bacteria, always practice the first feed in, first feed out rule. This may take an extra bin or two to take delivery of replacement feeds while older stocks are used up.

Clean bins between use — Remove all the old feed and dust between loads. Pressure washing with adequate drying time is best to maintain feed quality. Clean the feed barn of dust and cobwebs occasionally.

Control rodents and birds — Rats, mice, and birds are likely one way feeds get contaminated. Do your best to keep their numbers and access to feed low. Don't forget to beware of other animals, like barn cats. Have you ever seen cats using your feed as a litter box?

