# Dairy Opportunities: A Feedlot Consultant's Perspective on Feeding and Milling

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## Introduction

Substantial crossover exists between feedlots and dairies where feeding and milling concepts are concerned. Both industries can learn from one another. Feedlots have placed management focus on improving feed conversions and; consequently; cost of gains. While untraditional, dairy focus on feed conversion and feed cost of milk production represents economic opportunities.

The competitiveness of the feedlot industry has resulted in feeding higher energy diets for extended periods of time. Specific management practices have allowed this adoption. Namely, fat, ionophores, and feed bunk management practices can aid dairy producers improve their bottom lines, as well. Milling consistency and inventory management can help dairy producers put more dollars in their bank accounts. The objective of this paper is to discuss economic opportunities for improving dairy production from a feedlot consultant's perspective on feeding and milling.

## Discussion

### Feeding

Feedlots and cattle feeders have maximized profits or minimized losses by measuring production costs. Feed cost of gain represents approximately 90-95 % of total cost of gain in feedlot production. The remaining 5-10 % is death loss and medicine/processing costs. Consequently, identifying factors impacting feed cost of gain pays dividends.

The following principle has made feedlot operators and cattle feeders a lot of money:

**Feed Conversion X Ration Price = Feed Cost of Gain.**

For example:

Dry Matter Intake = 18.0 lb/hd/d.
Average Daily Gain = 3.0 lb/hd/d.
Dry Matter Conversion = dry matter intake/average daily gain = 18/3 = 6.
Dry Matter Ration Price = $8.00/CWT.

Therefore:

Feed Cost of Gain = 6.0 X $8.00 = $48.00/CWT.

Dairy producers can capitalize on this concept, as well.

**Feed Conversion X Ration Price = Feed Cost of Milk Production.**

For example:

Dry Matter Intake = 50 lb/hd/d.
Milk Production = 100 lb/hd/d.
Dry Matter Conversion = dry matter intake/milk production = 50/100 = 0.50.

Dry Matter Ration Price =
$8.00/CWT.

Therefore:

Feed Cost of Milk Production =
0.50 X $8.00 = $4.00/CWT.

Improving feed conversion 5-10 % improves feed cost of gain or feed cost of milk production 5-10 %. Therein lies the economic opportunity for feedlot and dairy production facilities.

For a number of reasons, feedlot finishing diets have become more energy dense over time. The most critical; however, being competitiveness and economic survival. Energy cost is highly important and energy dense feeds, such as grains, are often better energy buys than roughages. In contrast to the lactating dairy cow, feedlot cattle do not have a stated roughage requirement. Roughage level is set consistent with the management level of the feedyard. Resultantly, the aim is to feed a finishing diet as energy dense as possible, because that is where the cheapest cost of gain is made.

Specific management practices have clearly allowed the feeding of high energy feedlot diets successfully. Consequently, feed conversions are approaching those of the hog industry. These include:

- Fat
- Ionophores
- Feed Bunk Management

***Fat***

Fat is often a good energy buy. This is particularly true the further away a production facility is located from the grain source. A more favorable fat:grain price ratio usually exists for these situations. The Pacific Northwest would be an example.

Fat has intrinsic value beyond being a good energy purchase under most circumstances. Added fat improves quality grade and minimizes the risk for digestive upsets in feedlot cattle. A high quality product that assays consistently is very important. Fat is *rumen friendly*.

Feeding fat to a lactating dairy cow can be an excellent management tool as long as fat level and variability are not issues leading to depressed fiber digestion and/or erratic intakes. Fat is like feeding a drug. It must be fed consistently.

***Ionophores***

Rumensin®(Elanco, Greenfield, IN) improves feed conversion and reduces the risk of digestive upsets in feedlot cattle. Rumensin was first approved in feedlot diets in 1975 for improved feed efficiency and then later coccidiosis control. Rumensin is the only cleared ionophore for lactating dairy cows at the present time. On October 28, 2004, the United States Food and Drug Administration (FDA) approved Rumensin (monensin sodium) for use in lactating and dry dairy cow rations. The approval claim for dairy cows is “For increased milk production efficiency (production of marketable solids-corrected milk per unit of feed intake)”. Rumensin has aided the feeding of higher energy diets conducive to improved feed conversions in feedlot cattle. Finding better ways of utilizing existing products is the management challenge. Rumensin is dairy management’s weapon of the future.

***Feed Bunk Management***

Feed bunk management is the process of getting the RIGHT Feed to the RIGHT Pen in the RIGHT Amount at the RIGHT TIME in the RIGHT Way. This is referred to as The 5 "R's" of Good Feed Bunk Management:

- Right Feed
- Right Pen
- Right Amount
- Right TIME
- Right Way

*Right Feed*

Ration formulation is only as good as the moisture values used in formulation. Ingredient moisture is simply the driver in ration formulation for ruminants. All other nutrients are balanced only to the degree proper moistures are used in formulation. This is especially critical when feeding wet by-products and/or fermented feeds such as silages and high moisture grains.

Daily *on site* moisture measurement of ingredients and rations via a forced air oven is where dairies can gain a competitive edge. An *on site* forced air oven is superior to Koster and microwave ovens for moisture measurement and monitoring. Koster and microwave moisture measurements are rapid, but not accurate. Investing $1,500.00 - $2,000.00 in a professional laboratory forced air oven does not cost – it pays. For example, a feedlot diet running 1 point wetter than formulated can increase cost of gain 1.5 % because water gets fed as energy. On today's prices that corresponds to approximately $4.50/head marketed. Or, $506,250.00/year for a 50,000 head feedyard turning over 2.25 times/year.

Daily moisture measurement is key. A *systems approach* is very important. The pattern of results is far more critical than a single assay point in time. No *short cuts* exist in this area.

A consistent and disciplined quality control program on ingredients and rations cannot be overemphasized. Consistency can be monitored through use of coefficient of variation (CV, %). The lower the CV, % the more consistent the data are. On the basis of five completely mixed ration samples CV, % < 10 = Acceptable. CV, % < 5 = Excellent. Statistical Process Control (**SPC**) is another excellent quality control tool.

*Right Pen*

Pen space and bunk inch guidelines are limited in the feedlot world. Dairies have better established square footage and manger inches/animal via research studies. There is a large research need in this area of feedlot production.

Mud is the biggest deterrent to maximizing feedlot performance in the wintertime. Consistent implementation of the *Hotel Concept* is highly important for both feedlots and dairies. That is, a pen is cleaned after cattle leave and before new ones arrive.

A pre-determined/scheduled pen cleaning is more critical in a dairy, because cows are continuously moving in and out of pens.

Water quality should not be overlooked. Cleaning water tanks on a pre-determined schedule is highly advised.

*Right Amount*

This is another specific area dairies can gain the competitive edge. Many dairies

feed lactating cows for 5-10 % feed refusal. Some have progressed to 2-5 % feed refusal. This is how feedlots used to deliver feed before the management benefits of added fat, ionophores, and intense bunk management practices became known. Today, many feedlots feed to a *clean bunk*. Cattle are content at feeding times, digestive upsets are controlled and production efficiency is maximized.

While the logistics of feeding lactating cows to a *clean bunk* is not without challenges, huge economic incentives exist. The *push out* or feed refusal that gets fed back to replacement heifers is the most expensive feed on the entire dairy. That is because replacement heifers are getting *orts* priced at lactating cow ration price. Cutting current feed refusal objectives, at least in half, presents economic opportunity.

Dairy producers should give serious consideration to hiring/implementing a feed manager to *read* cows, call feed and manage feed refusal. Feedlots have reaped economic benefits of having a bunk reader/cattle reader as part of their management team. Therein lies the management challenge for dairy producers. Zero feed refusals – successfully.

*Right Time*

Timely feeding is the ultimate measurement of a successful feed management team. The goal in this area is to feed every pen of cattle +/- 5 minutes of the same time every day. *Consistency. Consistency. Consistency.*

For a feedlot to meet its timely feeding objective all departments must be hitting on all eight cylinders. People are on time, trucks are running and cattle movements are pre-programmed not to interfere with feeding.

Does milking occur +/- 5 minutes of the same time - every day?

*Right Way*

The key to controlling digestive upset is controlling variability. Emphasis is placed on level feed distribution and one pass feeding in the feedlot. The only need for reverse gear in a feed truck is to back it out of the shop in the morning. Level feed distribution is a subjective measure of consistency at the bunk level. Variability in this area predisposes individual animals to digestive risk; such as, bloat/acidosis, founder, and liver abscesses. In the feedlot industry the survivors are measured as *railers*. Railer cattle are worth approximately half the price of their healthy counterparts.

**Milling**

The 3 "C's" of feeding and milling are:

- Consistency.
- Consistency.
- Consistency.

Consistency is the ruminant's friend. Variability is the enemy. In the feedlot, excessive variability rears its ugly head as founder, liver abscesses, and digestive upsets such as bloat/acidosis. In the dairy, displaced abomasums and hemorrhagic bowl syndrome are counterparts to digestive upsets in a feedlot. A measure/manage approach is very important in this area. This allows measurement of *expected vs actual*, which is highly important to making intelligent management decisions. Feedlots have learned a certain number of anomalies

are acceptable, because production efficiency and profit potential are maximized. The goal for many feedlots is to keep digestive death loss below 0.05 % of the population on a monthly basis.

***Feed Mill Types***

Three different feedlot mill types were evaluated for accuracy and consistency of complete feed production (Table 1 and 2). These feed mills represent a random selection of complete mixed top ration quality control results from the Koers-Turgeon Consulting clientele base over a specific time frame (4/16/03 – 4/15/04). Three different feedlot mill types were evaluated:

- **Feed Truck Mounted Mixer**. Feed mixed and delivered from the feed truck. Front-end loader used to load dry ingredients.
- **Stationary Mixer on the Ground**. No feed mixed on the truck. Front-end loader used to load dry ingredients.
- **Finished Feed Mill**. No feed mixed on the feed truck. No front-end loader, only delivery box.

While some subjectivity is needed in making the comparisons, accuracy was good for all mill types (Table 1). On average, lab results were in close agreement with formulated target nutrient levels for all three mill types.

Bear in mind accuracy measures how close one comes to hitting the target. Precision and consistency are measured by how often one hits the target. As stated earlier, coefficient of variation, % (CV,%) is a statistical measure of consistency. The lower the CV, % the more consistent the data are.

Monitor the consistency and adequacy of a ration mix with CV, %. As a rule of thumb and on the basis of five completely mixed ration samples:

CV, % < 10 = Acceptable
CV, % < 5 = Excellent

**Table 1.** Nutrient accuracy for different feed mill types.

| Feed Mill Type | No. Yards | No. Samples | Protein,% | NPN,% | Fat,% | Crude Fiber,% |
|---|---|---|---|---|---|---|
| Truck Mixer | 4 | 172 | 12.6 | 2.6 | 6.7 | 4.9 |
| Stationary Mixer | 4 | 147 | 12.5 | 2.4 | 6.7 | 4.8 |
| Finished Feed | 2 | 69 | 12.6 | 2.3 | 6.7 | 5.2 |
| **Target** | | | **12.5** | **2.5** | **7.0** | **4.9** |

Feed mills represent a random selection from the Koers-Turgeon Consulting client base.

Complete mixed ration samples obtained 4/16/03 - 4/15/04.

**Table 2.** Nutrient Consistency (Coeffients of Variation, CV,%) for Different Feed Mill Types

| Feed Mill Type | No. Yards | No. Samples | Protein | NPN | Fat | Crude Fiber | Average CV,% |
|---|---|---|---|---|---|---|---|
| Truck Mixer | 4 | 172 | 4 | 13.7 | 11.7 | 13.8 | 10.8 |
| Stationary Mixer | 4 | 147 | 3.6 | 12.4 | 12.1 | 14.8 | 10.8 |
| Finished Feed | 2 | 69 | 10.1 | 31.9 | 15.7 | 28.9 | 21.7 |

Feed mills represent a random selection from the Koers-Turgeon Consulting client base.
Complete mixed ration samples obtained 4/16/03 - 4/15/04.

Interestingly, consistency of the laboratory results indicated the most variable feed (highest CV,%) was produced from the higher priced ***finished feed*** mills (Table 2).

The mill type comparisons should be looked at with a careful eye. Just like there is as much or more variation within a breed type as across breed types, the same may be true for feed mills.

### *Inventory Management*

Huge dollars are at stake in this area. Many view a good inventory program as simply good housekeeping and minimizing commodity shrink. While that is partially true, a good inventory management program helps ensure what we think is happening in ration formulation is actually happening. An inventory variance report, along with laboratory quality control results, serves as an excellent *check and balance* system on ration formulation, ingredient loading, and ration mixing; given proper sampling methods are used. All of which impact the bottom line. For example, a ration that assays unusually high in protein with a corresponding inventory loss of protein supplement is cause for concern. Measure/Manage.

Many feedlots do a physical inventory on all commodities monthly. Some do a physical inventory every 15 days as that corresponds to their billing cycles. Physical inventories may be done more often when chasing a problem with a specific ingredient. Table 3 presents a *Monthly Inventory Variance Report* commonly used in the feedlot industry. It is an excellent management tool when used consistently. Cubic foot boxes and density probes should be standard operating equipment for any mill manufacturing facility.

**Table 3.** Example of an *Inventory Variance Report - Monthly Basis.*

| Ingredient | Previous Month Ending Physical, lbs | Receipts/ Purchases, lbs | Usage/ Sales, lbs | Declining Book, lbs | Ending Physical, lbs | Variance, lbs | Variance, % |
|---|---|---|---|---|---|---|---|
| Corn | 2,000,000 | 6,000,000 | 7,000,000 | 1,000,000 | 650,000 | -350,000 | -5 |
| Supplement | 200,000 | 600,000 | 700,000 | 100,000 | 65,000 | -35,000 | -5 |
| Premix | 20,000 | 60,000 | 70,000 | 10,000 | 13,500 | 3,500 | 5 |

**Summary**

Feed cost of gain represents approximately 90-95 % of total cost of gain in feedlot production. Consequently, economic incentives exist regarding feeding and milling production practices. Because feed cost of gain is a function of feed conversion and ration price improving, one and/or both results in cheaper production costs.

Similarly, feed cost is a significant cost in dairy production. Economic opportunities exist for dairy producers to improve feed conversions and feed cost of milk production. Specific feedlot management practices have allowed the feeding of high energy diets successfully. Similarly, fat, ionophores, and The 5 "R's" of Good Feed Bunk Management can be used by dairy producers to improve their bottom lines. Variability is the ruminant's enemy. Consistent feeding and milling practices, as well as, inventory management control systems can be used to improve dairy production costs – even in today's well managed dairies.