

Reducing Feed Cost while Optimizing Productivity

Barry Robinson

Great Northern Livestock Consulting Ltd., Box 5540, Westlock AB T7P 2P5
Email: brobinson@xplornet.com

■ Take Home Messages

- ▶ High quality forages minimize feed cost.
- ▶ Attention to detail minimizes problems and indirectly reduces feed cost.
- ▶ Select your nutritionist and feed mill with care. Your nutritionist should be competent, up to date, and trust worthy. Most important of all, put your farm first.
- ▶ Research and goal setting are necessary to determine whether the optimal purchase for your dairy is complete feed, supplement or premix and commodities.
- ▶ Rolled canola is an over looked source of supplemental fat and protein in western Canada.
- ▶ Select feed additives wisely. Review your feed additives every 6-12 months to be sure you are making cost effective expenditures.

■ Introduction

Feed cost is the single largest variable cost in producing milk. According to the 2011 Alberta Dairy Cost Study (Heikkila and VanBiert, 2012), 33% of the cost of milk production is feed related. The top third of the producers spent 29% of total costs on feed while the lower third spent 38% on feed. What percent of your production cost is spent on feed? In this paper, we will examine different strategies to optimize production while minimizing off-farm feed expenditures.

The feed industry is an integral part of the dairy industry. The feed industry is a partner with your farm and also needs to be successful. However, the feed industry does not need to sell your farm more feed or feed additives than your dairy requires. The following topics are key points relative to minimizing feed cost while maintaining production.

■ Forages

The most cost effective way to minimize feed cost and to maintain or enhance milk production is to raise, store and feed high quality forages. Cows optimize milk production when they consume high quality, high energy forages. When low quality forages are fed, milk production suffers. When milk production is low, due to low quality forages, sometimes dairy producers attempt to increase production by significantly increasing expenditures at the feed mill. This type of expenditure is not necessary if high quality forages are fed.

The largest change in forage production in western Canada in the last 5 years or so is the production of low heat unit corn for corn silage. In my experience, well preserved corn silage with 20-30% starch has the potential to significantly boost milk production as compared to conventional forages. Because of the possibility of early frost, I do not recommend putting up all your cereal forages as corn silage. Corn silage that has not properly matured due to frost will have little or no starch. This type of corn silage is low in energy and should be fed to low producing cows, heifers or dry cows.

Corn silage that has fermented for 3-4 months has more available energy than corn silage fermented for 1 month (Ward and de Ondarza, 2009). A kernel processor on the chopper is very important relative to optimizing available energy in the corn silage. The kernel processor must be properly set as custom operators tend to “bump open” the kernel processors because they take more horsepower. Monitor the kernels several times per day during chopping.

To extend the use of excellent forages, high quality forage should be fed only to the high producing cows. Therefore, an excellent forage crop can last two seasons rather than one. Lower quality forages can be fed to dry cows, low producing cows and heifers.

■ Attention to Detail

Excellent managers spend less money purchasing feed as compared to average or poor managers. The excellent managers experience less feed related problems. Many times poor managers attempt to purchase feed additives or additional energy at an added cost to correct problems caused by poor management in the first place.

Selecting your Nutritionist

There are nutritionists that work for feed mills and there are independent nutritionists. Which should you hire??? Is this the most important question? In my opinion, no. A better question is: Does the nutritionist put your farm first or

the feed mill's tonnage and profit first? When the farm wins, all industries associated with the farm win. When the farm fails, all associated industries lose business. For long term success, your farm needs to be put first.

How can you tell whether the farm or the feed mill comes first? A good measuring stick is the recommendations that occur when problems are encountered. Is your nutritionist's first approach an attempt to sell you something to fix the problem or does your nutritionist ask a series of questions to determine the root of the problem? For example, a dairy client indicates that butterfat has suddenly dropped. Would your nutritionist immediately suggest that you buy a feed additive to fix the low butterfat? Or, would your nutritionist ask a series of questions to attempt to find the root of the problem. Perhaps the silage that you are feeding is now wetter than the silage in the initial formulation and the forage to concentrate ratio is incorrect. The problem caused by a change in moisture content of the forage can be solved by a re-formulation at no cost as compared to buying yeast or a buffer or other feed additive in an attempt to solve the problem.

Is your nutritionist honest and competent and keeps up with the latest research? Do they have common sense and have an excellent ability to communicate? Your nutritionist and veterinarian should communicate and cooperate for the benefit of the farm. Can your nutritionist say "I do not know, but I will find out for you?" Do they follow up? Finally, does your nutritionist care about you and your farm? No one is perfect, but these are important characteristics that are very important for a successful working relationship.

Dairy Farmer's Responsibility

Working with your nutritionist and feed mill is a two way street. It is critical for you to communicate clearly and effectively with your nutritionist and feed mill. Be sure to ask good questions during farm calls. Provide accurate data to assist in solving problems. Be respectful and fair in your discussions and decision making. Give the feed mill plenty of lead time when ordering feed.

If your farm requires a high level of service and your feed mill expenditures are low, you may need to pay an additional consulting fee to the feed mill.

■ Production Decisions

A significant amount of money can be spent on feed and feed additives when pursuing a higher level of milk production. What is the milk production goal for your farm? Do you change what you buy if you are over or under quota? Why spend extra money on feed when you are over quota and you are going to give the milk away? Is your production goal about profitability or ego?

Complete feed, supplement or premix and commodities? Which route to go? There is no one answer that fits all dairy farms. The following factors should be taken into consideration. Complete feed is convenient to the farm and flexible relative to formula changes. Complete feed requires the least amount of farm labour. However, complete feed requires the greatest off-farm expenditure of money. Do you grow your own barley? Complete feed makes more sense for farms that do not grow their own barley and are reasonably close to the feed mill to minimize freight costs.

Dairy supplements work well for farms that grow their own barley. Dairy supplements may be formulated with a variety of protein sources that can meet the protein needs of the high producing cow. I recommend feeding a fixed amount of supplement and have a protein commodity on the farm such as canola meal or dried distiller's grains to increase or decrease protein in the total mixed ration when protein in the forages change. When the supplement feeding rate remains fixed, the trace mineral, vitamin and feed additive levels remain fixed as well.

The least expensive off-farm expenditure for feed is purchasing a premix and commodities. This route is the most labour intensive. This strategy makes the most sense with large dairy farms that raise their own barley and can purchase truckloads of commodities.

Grain

Barley is by far the most common grain fed to dairy cows in western Canada. When purchasing barley, be sure to define bushel weight and moisture parameters. Farms that do not measure bushel weight feed light barley.

Oats can be fed to heifer calves and dry cows if the cost per unit of energy is less than barley. Small quantities of wheat are fed to dairy cattle because of the rapid rate of digestion of wheat. Peas are an excellent source of energy and degradable protein. If your dairy feeds peas, be sure to analyze for protein as protein may range from 18-23% in field peas.

Corn grain can be formulated into dairy rations based on price and your production goals. Corn is almost always priced significantly higher than barley (Table 1). However, corn has a greater energy density than barley and may be profitable to feed when your forages are short of energy (Kennelly et al. 1999).

Table 1. Price of grain commonly fed in Western Canada; November, 2013

Name	Energy Relative to Barley	\$/tonne	Price Relative to Barley*
Barley	100%	155	100%
Wheat	102%	180	114%
Oats	92%	145	102%
Corn	105%	230	141%
Peas	101%	220	140%

*Adjusted for energy content.

Fat

The first three limiting nutrients in most dairy rations are energy, energy and energy. Fat has approximately 2.25 times the amount of energy as an equivalent weight of grain; therefore, fat is very useful in dairy rations to boost energy density. There are several types of fat that can be fed. The following fats are commonly fed in western Canada: canola oil, rolled canola, feeding fat (vegetable/tallow blend) and rumen bypass fats (Table 2)

Rolled canola is an excellent supplemental fat source. Rolled canola has approximately 39% fat and 26% protein. Canola can be grown, rolled and fed on your own farm.

Bypass fats are very convenient to feed, but also very costly. Discuss the cost:benefit ratio of fat feeding with your nutritionist.

Table 2. Common supplemental fat sources fed in western Canada, November, 2013

Name	% Fat	\$/tonne	\$/kg of fat
Rolled Canola	39	450	1.15
Canola Oil	100	1,150	1.15
Feeding Fat	100	820	0.82
Bypass Fat	95	1,900	2.00

Protein

Dairy farms spend a significant amount of money on supplemental protein. What is the total level of protein in your milk cow rations? Previously, many lactating rations in western Canada were balanced for 18-18.5% crude protein. Today, most lactating rations that I formulate are 16.8-17.0% protein. No drop in milk production has been observed when the lower protein level is fed. What level of protein are you feeding? Of course, soluble, degradable and un-degradable protein fractions must be considered as well.

Urea is the cheapest form of supplemental nitrogen. The rumen microbes build protein from the nitrogen provided by urea. Urea has a reputation of being unsafe for ruminants. If formulated and fed properly, urea will save money on protein cost.

Milk urea nitrogen (MUN) is an excellent tool to evaluate the protein status of your cows. During farm calls, the dairy producer and I discuss MUN's as much as butterfat. MUN tests from every tank of milk are a very useful trouble shooting tool. In my experience, bulk tank MUN's ranging from 10-14 mg/dl are ideal. Under 10, protein in the ration may be deficient or out of balance. MUN's over 14 may indicate the cows are over-consuming protein. MUN's 16 and higher may cause reproductive problems. An excellent article discussing MUN's can be found at the following website.

<http://research.vet.upenn.edu/DairyPoultrySwine/DairyCattle/MUN/MilkUreaNitrogen/tabid/1596/Default.aspx>

The cheapest protein source is not the best source of protein. For example, Table 4 shows that blood meal is the most expensive protein source per unit of protein. Blood meal is an excellent source of bypass lysine for high producing herds. Your nutritionist can discuss the pro's and con's of each of the different protein sources.

Table 4. Common protein sources fed in western Canada, November, 2013

Name	% Protein	\$/tonne	\$/kg of protein
Dehy Alfalfa	18	260	1.44
Corn Distillers	27	308.	1.14
Wheat Distillers	36	300	0.83
Canola Meal	36	340	0.94
Soybean Meal	46	600	1.30
Corn Gluten Meal	63	925	1.47
Blood Meal	80	1,400	1.75
Hydrolysed Feather Meal	82	725	0.88
Urea	283	745	0.26

Feed Additives

Dairy farms spend a significant amount of money on feed additives each year. Dairy farms could spend 100% of the profit on feed additives. Choose feed additives wisely. The following questions should be asked prior to agreeing to purchase feed additives. What is the purpose? How consistent is the research? Who conducted the research? Is the research repeatable? Was the research conducted in an un-biased manner? What is the predicted cost:benefit ratio?

I recommend reviewing the feed additives that you purchase every 6-12 months. When the review takes place, you can “keep and cull” feed additives based on current need. For example, in the recent past, you may have put up poorly digestible forages and a feed additive such as yeast may have been purchased to assist in the digestibility of the low quality forages. In the following years, your forages were excellent and the yeast product may now not be cost effective. Without review, your dairy will continue to spend money on this feed additive.

Additional example: if your nutritionist suggests feeding rumen protected lysine or rumen protected methionine (see Table 5 for estimated cost); be sure to ask about the current inclusion rate of protein sources such as blood meal (bypass lysine) and corn gluten meal and distillers grains (bypass methionine). These protein sources are significantly cheaper sources of bypass lysine and bypass methionine than synthetic sources.

For a comprehensive list of feed additives and their cost-benefit ration, please see Hutjens (2010).

Table 5. Select feed additives showing a wide range in cost fed to dairy cows in western Canada, November 2013

Name of Feed Additive	Estimated cents/head/day
Yeast	6-7
Rumensin	2.5-3
Buffer	7-8
Zinc Methionine	2-3
Anionic Salts	50-95
Rumen Protected Lysine	17-50
Rumen Protected Methionine	20-40

■ Summary

- ▶ Cows produce high levels of milk when fed high quality forages. In addition, when high quality forages are fed, less money is spent off the farm.
- ▶ Attention to detail minimizes problems and leads to less money spent on “fix it” solutions.
- ▶ Your nutritionist should put your farm first. If your farm is successful, then all related industries will be successful.
- ▶ Research and planning will determine whether your farm is best suited for complete feed, supplement or premixes and commodities.
- ▶ Evaluate the herd’s protein status through the use of bulk tank MUN’s.
- ▶ Consider growing, rolling and feeding canola as a protein and fat source.
- ▶ Carefully select feed additives and review purchase every 6-12 months.
- ▶ There are no silver bullets in nutrition.

■ References:

- Heikkila, R. and P. Van Biert. 2012. The Dairy Cost Study: Economics of Milk Production in Alberta 2011. Volume 71
- Hutjens, M. 2010. Evaluating Feed Additives, University of Illinois Extension, Illini Dairy Net
- Kennelly, J. et al. 1999. Barley Grain for Dairy Cattle, University of Alberta, Dairy Research Highlights 1B3:1
- Ward, R. and M.B. de Ondarza. Let your Corn Silage Cook Awhile; Hoards Dairymen, August 25, 2009:532



