

\$/hL or Return Over Feed Cost?

If you are anything like the average producer participating in the annual Dairy Cost Study, you probably spend \$55-60 a month per cow on purchased feeds. When you consider the value of your home-grown feeds, your total monthly feed cost per cow is probably in the \$90-110 range.

Many of the producers I deal with express a single-minded determination to reduce feed costs without decreasing production. Others are more concerned about increasing output per cow, to improve production efficiency.

Of course, feed costs and milk yield are closely related because feed intake drives production (see article III : Every Extra Pound Is Profit). But feed cost per hectolitre (hL) varies widely among herds in Alberta. As shown in Table 1, when herds on the 1993 Dairy Cost Study were ranked on an overall management rating, the top third had an average total feed cost of \$1302 per cow per year compared with \$1120 for the bottom third. But because of significant differences in output per cow, total feed cost per hL worked out to \$14.70 for the top; \$16.08 for the bottom.

In the Dairy Cost Study, total feed costs are based on feed utilized by all dairy animals on the farm. Here's how to calculate and interpret direct feed costs and returns for your lactating cows :

Cost per hectolitre

The worksheet at the end of this article will simplify calculation of your own feed costs. An example is presented in table 2 below. In our experience, when calculated in this way, a feed cost of \$10.15 per hL is about average, with values ranging from below \$8 to over \$12.

It's important to estimate a realistic price for your home-grown feeds. Use either your cost of production or an *opportunity value*, which is the value of the feed if it was sold or used for an alternative purpose.

Table 2 : Example calculation of feed cost per hectolitre of milk produced.

	TOP THIRD	BOTTOM THIRD
Cows, milking & dry	66	64
Milk, litres/cow/year	8857	6966
Feed cost, \$/cow/year	1302	1120
Feed cost, \$/hL	14.70	16.08

Table 1 : Results from the 1993 Alberta Dairy Cost Study. Farms were ranked using an overall management rating.

Haylage price can be based on a hay-equivalent value. For example, if you can buy or sell 87% dry matter (DM) hay for \$90/ton, then a similar crop of 40% DM haylage could be valued at : $\$90/\text{ton} \times 40\% / 87\% = \$41/\text{ton}$.

It is more difficult to place an opportunity value on barley silage, except in southern Alberta where it is routinely bought and sold for \$28-30/tonne adjusted to a 35% DM equivalent.

Now that you've calculated your current cost of production, you have a benchmark to work from in evaluating feeding alternatives. For example, notice that supplement accounts for over half of the total feed cost in the example. If you could lower its cost from \$352 to \$300/tonne without sacrificing milk production, your daily feed cost would be \$14.30 lower and your cost per hL would fall to \$9.40.

Calculating your feed cost per hectolitre can be useful when you are looking at lowering feed costs without changing production. But when your objective is to increase milk yield, you may find that an increase in \$/hL reflects more profitable production.

FEED	units (lb or kg)	units fed per day	cost per unit	cost per day
Barley Silage	lb	1320	0.015	19.80
Alfalfa Haylage	lb	1320	0.018	23.76
Barley	lb	970	0.052	50.44
Supplement	kg	275	0.352	96.80
Mineral	kg	2.5	0.525	1.31
Milk hL produced ...	18.92	Total feed cost	192.11	
Milk value per hL	52.00	Feed cost per hL	10.15	
Milk income	983.84	Income-feed cost	791.73	

Here's an example :

Using the information in table 1 as a starting point, let's say you want to raise production per cow to fill your increased MSQ allocation. You might try doing this by increasing the amount of barley and supplement in your ration by 15%. As shown in table 2, this increases your daily feed cost to \$213.73 and milk production rises 3.4% to 1956 litres per day.

FEED	units (lb or kg)	units fed per day	cost per unit	cost per day
Barley Silage	lb	1320	0.015	19.80
Alfalfa Haylage	lb	1320	0.018	23.76
Barley	lb	1115	0.052	57.98
Supplement	kg	315	0.352	110.88
Mineral	kg	2.5	0.525	1.31
Milk hL produced ...	19.56	Total feed cost	213.73	
Milk value per hL	52.00	Feed cost per hL	10.93	
Milk income	1017.12	Income-feed cost	803.39	

Feed cost per hL has increased from \$10.15 to \$10.93. If you were to base your decision on this figure, you might decide that increasing your production was unprofitable. But that conclusion would be wrong!

Return over feed cost

Although daily feed cost has risen by \$21.62, daily milk income has increased by \$33.28, an instant 54% return on your investment. By this measure, the decision to feed more concentrate is profitable, even though feed cost per hectolitre has increased.

Return over feed cost - the difference between milk income and feed cost - has risen from \$791.73 per day to \$803.39. Any change in feeding that results in an increase in this measure can be considered profitable. This simply indicates that an extra dollar spent on feed yields more than that dollar in return from milk sales.

Table 2 : Based on table 1 example with higher production resulting from increased feeding of barley and supplement.

Of course, the opposite is also true. That is, any change that lowers return over feed cost is unprofitable. In this case, an extra dollar spent yields less than a dollar in return.

The law of diminishing returns suggests that at higher levels of production, each subsequent unit of added input returns a lower increment of output. Maximum profit is realized when the cost of the last unit of input is exactly equal to the value of the output it produces.

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FEED COST WORKSHEET				
FEED	units (lb or kg)	units fed per day	x cost per unit	= cost per day
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A Daily milk produced (hL)	__ __ __ __	D Total feed cost per day	__ __ __ __	
B Milk value (\$/hL)	__ __ __ __	E Feed cost per hL (D / A)	__ __ __ __	
C Milk income/day (A x B)	__ __ __ __	F Income - cost (C - D)	__ __ __ __	