



Dairy Briefs



The Latest Information
on Dairy Cattle Nutrition

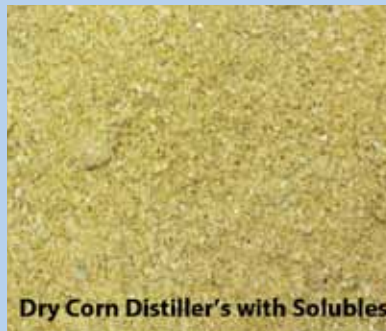
Alternative Protein Sources Laura Martin, M.Sc

Soybean meal prices over the summer triggered producers to search for alternative sources of protein to help reduce off-farm protein costs. With prices falling now that soybeans are being harvested re-evaluating these alternative proteins might be a good idea. With the wide variety of protein alternatives available now, due to different processing industries, choosing the right source for the farm isn't always easy.

Alternative sources of protein typically available in Ontario are corn distillers with solubles (both wet and dry), corn gluten feed (both wet and dry), corn steep liquor, wet brewer's grains, and canola meal. Each comes with its own benefits and challenges.

Dry Corn Distiller's with Solubles (DDGS)

DDGS are a co-product of the ethanol industry. DDGS are an excellent source of by-pass protein and therefore compliment diets with high haylage or high soluble protein. If adding DDGS into a diet, mineral levels should be adjusted to account for the high phosphorus and potassium levels found in this protein source. Feeding DDGS to milk cows is often limited by two factors. DDGS is high in fat – corn oil. Dietary fat levels must be kept under 5% in the total ration or risk reducing rumen function. High levels of this fat can also depress butterfat in the milk. The second limiting factor is that while DDGS are a good source of other essential amino acids, lysine levels are low. This means that DDGS work best if complemented with a protein source high in lysine, like soybean meal (SBM).



Dry Corn Distiller's with Solubles

Wet Distiller's Grains

Very similar to DDGS in terms of protein levels, wet distiller's grains are typically 65 – 75% moisture. The protein is much more degradable than the dry product, with by-pass protein levels similar to soybean meal. Dietary fat levels are also a consideration with wet distiller's although moisture is typically the main limiting factor. With today's high forage diets there is

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Alternative Protein Sources
By: Laura Martin, M. Sc, Nutritionist

Let



help you make
better forage!



**SILO GUARD® II
FORAGE ADDITIVE
FOR ALFALFA,
CORN SILAGES AND
BALED HAY**

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usually enough moisture in the diet without requiring any extra, however if corn silage or haylage is taken off too dry then feeding wet protein products can help provide rations with necessary moisture. Wet products do come with storage and handling hassles though and this should also be considered before purchasing. In summer wet products can spoil quickly and should be used within 2- 5 days.

Corn Gluten Feed (Wet or Dry)

Corn Gluten Feed (CGF) is a co-product from the high-fructose corn syrup process, and is available in either a wet or dry form. This low-starch protein/energy source can take the place of both protein and corn in the ration. When included in a ration it will lower the non-structural carbohydrates that often limit butterfat production. If feeding a high starch diet and struggling to maintain butterfat CGF is an excellent choice to balance out a ration. The protein in CGF is very degradable and ration adjustments may need to be made to account for this by also supplying a good source of by-pass protein. CGF is high in phosphorus, potentially replacing some of the phosphorus supplied by the vitamin/mineral premix. Wet CGF can work as a partial replacement for forages when supply is tight. Palatability can be a concern with both wet and dry CGF and it should be gradually introduced into the diet.

Corn Steep Liquor (CSL)

CSL is also a co-product from the high-fructose corn syrup industry. CSL, similar in consistency to molasses, can be a challenge when it comes to storage and handling. CSL is an excellent source of protein, although the protein is highly soluble and this can limit dietary levels. High phosphorus levels, close to 3% DM, typically replace other dietary phosphorus supplementation. Palatability is the main limiting factor and high levels may cause reduced intakes in cows.

Wet Brewer's Grains

Wet Brewer's Grains are a co-product of the beer or malt industry, supply of this product can vary depending on season, with more available during summer when more Ontarians are consuming beer. While dried Brewer's Grains are high in by-pass protein, the wet counter-part is more degradable. Wet Brewer's Grains can also be used to partially replace forages when supply is short. Wet Brewer's Grains can have quite high fibre levels and this can limit intakes in cows due to the bulkiness of this product.

Canola Meal

Canola meal is a co-product from the edible oil industry. Canola meal is a high protein product that typically has higher essential amino acid levels than DDGS. The protein degradability is similar to SBM, and the amino acid profile often works well when combined with SBM and DDGS. It is also another good source of phosphorus, with levels just over 1% DM.

There are two main factors to consider before purchasing an alternative protein source. The first is whether the ingredient works on the farm. Storage and handling are details that need to be kept in mind, but more importantly does the ingredient fit nutritionally with what is already on farm. If the forage supply available is already on the wet side, then purchasing a wet protein source, such as wet DDGS or wet Brewer's Grains, is probably not the best fit. If starch is already too low in the diet, then a product like corn gluten feed, which is low starch and will replace some corn as well as protein, is not recommended. If the product doesn't fit the farm then price shouldn't even come into play.

The second key factor is price, obviously it doesn't make sense to switch out one expensive protein for another. Figuring out what is a good deal or not is not as easy as it sounds. With all these products having different protein, energy and moisture levels it is impossible to just spot compare prices, and it is easy to think something is a good deal. For example Wet DDGS at \$150/T might sound like a good deal when SBM is \$600/T but the actual feeding value is lower.

CALF MILK REPLACER



*Get your calves off to
the right start with
this 100% milk protein,
easy-to-use milk replacer!*

**Here is what Dairy Producers Wayne and
Judy Paxton have to say,**

We have been using firstSTART for almost two years. In that time we have really noticed a difference in the calves. They do well, they look good, their coats shine and they grow like weeds!

We had tried other milk replacers and decided to change to the firstSTART milk replacer when it was recommended by our Kenpal Sales Manager. We are glad that we did because the calves love it. We have even found that the calves won't drink whole milk after trying the firstSTART, they prefer the taste of the milk replacer, and because we trust Kenpal to make sure that the nutrition is top notch, we make sure we always have it on hand.

Wayne, Judy and Keith Paxton
Brunner, Ontario

If you would like to try firstSTART with your calves, contact your Kenpal Sales Representative for pricing.

May 21, 2009



OMAFRA has an excellent solution to this problem with their Comparative Feed Values for Ruminants Fact Sheet. They explain the different categories of alternative feeds and provide equations to evaluate most ingredients. The Petersen equations were designed to more easily compare alternative feed sources, taking into account energy, protein, and as values input are on an as fed basis - moistures:

$$A = [(TDN \text{ corn} \times CP \text{ of alternative feed}) - (CP \text{ of corn} \times TDN \text{ of alternative feed})] \div [(TDN \text{ corn} \times CP \text{ of SBM}) - (CP \text{ of corn} \times TDN \text{ of SBM})]$$

$$B = [(CP \text{ of alternative feed}) - (CP \text{ of SBM} \times A)] \div CP \text{ of corn}$$

$$\text{\$ per tonne of alternative feed} = (A \times \text{\$ price per T SBM}) + (B \times \text{\$ price per T of corn})$$

On first glance the equations may seem even more confusing than anything but OMAFRA has further simplified things by providing A (protein ratio) and B (energy ratio) in an easy to use table (Table 1). For the computer savvy it is easy to set the equations up in a computer program and then have the flexibility to play with nutrient values or compare to something other than SBM and corn.

Table 1: Feed Values of Alternative Protein Sources with Corn @ \$190/T and SBM @ \$600/T

Ingredient	% DM	% TDN	% CP	% TDN	% CP	Protein Ratio	Energy Ratio	Feed Value
		DM Basis		As-fed Basis				
Corn	87	89	9.6	75.7	8.2	0	1.0000	\$ 190.00
SBM 48	90	84	53.9	74.8	48	1.0000	0.0000	\$ 600.00
DDGS	90	83.7	29.5	77	27.1	0.4144	0.8792	\$ 415.68
Wet DDGS	30	84	29.5	25.2	8.9	0.1542	0.1825	\$ 127.22
CGF	90	82	23.5	73.8	21.1	0.3022	0.8042	\$ 334.12
CSL	45	95	45	42.75	20.25	0.3377	0.4929	\$ 296.25
Wet Brewer's Grains	25	67	25	16.1	6	0.1036	0.1255	\$ 85.99
Canola Meal	91	70	41	63.7	37.5	0.6375	0.8415	\$ 542.38

Based on the OMAFRA Fact Sheet: Comparative Feed Values for Ruminants (T. Wright and R. Lackey, 2012)

Trying a new feed on the farm doesn't have to be complicated. Ask your nutritionist to help decide which alternative protein sources work best with the feeds currently on farm. Then compare the feed value with commodity prices to make sure that it makes sense economically. Alternative protein sources may provide something that is currently missing in the diet - the cows might even thank you for it!



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