



Dairy Briefs



The Latest Information
on Dairy Cattle Nutrition

Picking the Perfect Protein Source

Laura Martin, M.Sc

Most protein sources used on Ontario dairy farms are co-products from other industries, even soybean meal. With the wide variety of protein sources now available due to different processing industries, choosing the right source for the farm isn't always easy. Protein sources typically available in Ontario are soybean meal, 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 source comes with its own benefits and challenges.

Soybean Meal (SBM)
A co-product of the soy oil industry, SBM is used as a protein source on the majority of farms in Ontario. Its amino acid and nutrient profile make it an ideal plant protein source for most farm animals, and it is considered

a good standard to compare other protein sources against. As SBM is often in high demand, prices can reflect this and drive producers to look for alternative sources of protein.

Corn Distillers with Solubles, Dried (DDGS)

DDGS are a co-product of the ethanol industry. They are an excellent source of by-pass protein and therefore complement 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, specifically corn oil. Dietary fat levels should 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.

Cont. >>

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Picking the Perfect Protein Source

By: Laura Martin, M. Sc, Nutritionist

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69819 London Road, RR #1, Centralia, Ontario, Canada, N0M 1K0

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This means that DDGS work best if complemented with a protein source high in lysine, like soybean meal (SBM).

Wet Distillers Grains

Very similar to DDGS in terms of protein levels, wet distillers 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 distillers although moisture is typically the main limiting factor. With today's high forage diets there is often enough moisture in the diet without requiring any extra. However, if corn silage or haylage is harvested too dry, then feeding wet protein co-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 co-product is dual purpose, and can take the place of both protein and corn in the ration. When included in a ration, it will lower the non-structural carbohydrates (NFC) 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. It is important to clarify that Corn Gluten FEED and Corn Gluten MEAL (CGM) are very different feeds. CGM is very high in protein, and an excellent source of bypass protein, however cost usually prohibits using it as a protein source on farm.

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, and because of that, 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, or to boost ration moisture if forages are too dry. Wet Brewer's Grains can have quite high fibre levels and this can limit intakes in cows due to the bulkiness of this product. Packing this co-product into silage bags can help extend on-farm storage up to one month before spoilage becomes a concern.

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.



Kenpal Robot Pellets

Draw cows in the free traffic system and produce minimal fines

Joe and Barb Terpstra, along with the help of children Chelsey, Alison, Emily and Cole own and operate Cranbrook Farms, a 300 herd milk cow operation in Brussels, ON. They have been customers of Larry Merner and Kenpal since 2003.

This past July, the Terpstras incorporated 6 Robotic Milking Systems into their operation. "It was a smooth transition and our Sales Rep was there," says Joe. Each day they average 2.9 visits to the robots, per cow and have a minimal fetch rate of less than 5%. "If they're not going in the robots, then there's something wrong with the pellets," says Barb, crediting Kenpal's Robot Pellets as contributing to some of their success with the robots.

When asked what makes the Kenpal Robot Pellets the right choice for their operation, Joe responds by saying "they're hard, stay whole, are palatable and draw cows in the free traffic system". Kenpal's gemSTART Robot Pellets are a blend of protein and energy sources designed to both support milk production and work as positive reinforcement to cows visiting the robots. The high quality pellets contain Herbageum Condiment flavouring agent to attract cows into the robot, and produce minimal fines in the feeders. Kenpal's Robot Pellets provide benefits for both the animals and producers.



Front Row: Joe & Barb Terpstra, Larry Merner
Back Row: Emily, Cole, Alison & Chelsey Terpstra

Since starting the Robotic Milking Systems with Kenpal's Robot Pellets, Joe and Barb have noticed a significant increase in their cows' production. They are anticipating an even greater increase in the months to come.

Having just filled their quota and recent incentives, the Terpstra family is looking forward to next year's incentive days with Kenpal by their side.

Joe, Barb, Chelsey, Alison, Emily and Cole Terpstra
Cranbrook Farms
Brussels, ON

Kenpal Farm Products Inc., 69819 London Rd, RR #1 Centralia, ON, N0M 1K0
Tel: 519-228-6444 • Toll Free: 1-800-265-2904 • Fax: 519-228-6560
kpalen@kenpal.on.ca • www.kenpal.on.ca

There are two main factors to consider before trying a different protein source on farm. 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 forages are already providing enough moisture, then purchasing a wet protein source, such as wet distillers or 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.

Kenpal has developed two new lines of dairy premixes: one line for diets with high levels of non-soybean meal based co-products and another line for diets that use soybean meal as the main protein source. Diets with higher alternative co-products have more minerals coming from feeds, especially phosphorus, magnesium and sulfur, so less is needed in the premix. The premixes in the high alternative co-product line are designed to work well with wet brewers, corn gluten feed, corn steep liquor and diets containing high levels of DDGS.

The second key factor to consider before trying a different protein source on farm is price. Protein costs contribute a significant portion of total feed costs, so finding a less expensive protein source to try would be best. Figuring out what is a good deal or not is not as easy as it sounds. All these products have different protein, energy and moisture levels and it is easy to think something might be a good deal. For example wet distillers at \$125/T might sound like a good deal when SBM is \$500/T but the actual feeding value is lower. Your Kenpal sales rep should be able to help when it comes to figuring out the value of different feeds.

Trying a new feed on the farm doesn't have to be complicated. Ask your Kenpal sales rep about the new dairy program and to help decide which protein sources work might work best for you. Trying different protein sources may provide something that is currently missing in the diet - the cows might even thank you for it!

Table 1: Feed Values of Alternative Protein Sources with Corn @ \$205/T and SBM @ \$500/T

Ingredient	% DM	% TDN	% CP	% TDN	% CP	Protein Ratio	Energy Ratio	Feed Value
		DM Basics		As-fed Basis				
Corn	87	89	9.6	75.7	8.2	0	1.0000	\$205.00
SBM 48	90	84	53.9	74.8	48	1.0000	0.0000	\$500.00
DDGS	90	83.7	29.5	77	27.1	0.4144	0.8792	\$348.37
Wet Distillers	30	84	29.5	25.2	8.9	0.1542	0.1825	\$114.24
CGF	90	82	23.5	73.8	21.1	0.3022	0.8042	\$297.56
CSL	45	95	45	42.75	20.25	0.3377	0.4929	\$232.21
Wet Brewers Grains	25	67	25	16.1	6	0.1036	0.1255	\$75.33
Canola Meal	91	70	41	36.7	37.5	0.6375	0.8415	\$400.63
Corn Gluten Meal	90	89	67.4	80.1	60.7	1.3029	0.2293	\$604.45

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

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