Ingredient Myths in the Dairy Industry

By Teresa Hanson, B.S.

What is a Myth? A myth is a person or thing having only an imaginary, or unverifiable existence, or something that is not real. These myths, sometimes called urban legends or old wives tales, have been around for generations and can range from what food to eat or drink to cure an ailment, to how to predict the weather. Being a results oriented/ scientific-minded person, I like to deal with facts. Myths are fiction. As a Dairy Nutritionist I have heard several claims that certain products or ingredients work as treatments or preventions for a lot of symptoms and health issues in the dairy industry. When I hear these claims, I assess the information and then make a decision whether to believe it or not based on the facts. Three of the more common claims that I have heard in the dairy industry have dealt with apple cider vinegar, molasses and kelp so let's take a look at the facts associated with these ingredients.

Myth #1

Apple Cider Vinegar helps with….

Anecdotal claims for using Apple Cider Vinegar (ACV) include: treating milk fever, increasing milk production, healthier calves, greater birth weights, faster rates of gain, treating mastitis, reducing somatic cell counts, shinier coats, maintaining higher fertility in semen, stimulating bulls who were previously uninterested, treating scours, improving digestion, stimulates appetite, tenderizes beef, parasite control, boosts the immune system, etc.

FACT: There is NO research or data to support any of these claims and there seems to be less and less anecdotal support. Apple cider vinegar is made using apples that have been fermented using a natural, aerobic acetation process. ACV contains only 5% acetic acid and has a pH of 2.4. Acetic acid is one of the volatile fatty acids produced by rumen bacteria. Each day, the cow's rumen produces approximately 4.0 lbs. of acetate from the daily ration. That is equal to feeding 9.51 gallons of ACV per head per day. The typical recommended feeding rate of ACV ranges from 1 to 2 ounces per head per day and provides only 5/100 to 1/10 of an ounce per head per day of acetic acid or at best, 0.008% of daily needs. Mathematically, that is comparable to feeding 3/100 of an ounce of corn to a cow needing 20 lbs. per day. Obviously, these small levels have no significant function. This small dosage rate, of which only 5% is acetic acid, is supplying very little acetic acid compared to what the cow is already producing with a balanced ration. If you are using ACV to help improve your herd's digestion, appetite, or to help with bunk heating, there are much better alternatives. Please contact Crystal Creek to consult with one of our specialists about better options.

Myth #2

Molasses can replace corn... as an energy source because molasses has three times the amount of energy compared to corn.

	Molasses	Shelled Corn
Dry Matter (%)	73.089	89.058
Crude Protein (%)	8.825	9.114
Soluble Protein (% C	94.89	20.74
RDP (% CP)	97.999	33.916
Lignin (%)	0.19	1.187
ADF (%)	0.387	3.644
NDF (%)	0.804	9.95
Crude Fiber (%)	1.077	2.363
Simple Sugars (%)	36.594	2.521
Starch (%)	0.973	70.077
NFC (%)	77.225	76.728
Fat (%)	2.323	4.233
Ash (%)	11.904	1.554
TDN (%)	72	88.127
Nel (Mcal/lb)	0.74	0.943
Calcium (%)	1.003	0.038
Phosphorus (%)	0.247	0.311
Magnesium (%)	0.342	0.117
Potassium (%)	3.88	0.405

*Based on information from DairyOne Online Feeds Library
**All nutrient analysis of the ingredient is on a dry matter basis.

Figure 1

FACT: Molasses is an excellent sugar source. Corn is an excellent starch source. Both are carbohydrates. Shell corn is 27.4% higher in energy than molasses. (See Figure 1) Molasses has been primarily used in the dairy industry to enhance palatability in grain mixes and TMRs. It can also be used to increase the sugar level in the overall ration if it is below the recommended level. Overall sugar in the ration should range from 5-8% but starch should also be in the overall ration at 22-26% for optimum production. In June 2011, Karen Hoffman (USDA Resource Conservationist) released a summary on a research project that evaluated feeding corn vs. molasses while on pasture. This study was done over the course of 2008 and 2009 on an organic dairy farm in central New York with cross-bred cows. The

first year, the molasses to corn ratio stayed the same feeding 3 lbs. of molasses with 1 lb. of a corn/barley mix. In 2009, the molasses to corn ratio changed on a seasonal basis. In April and May, 2 lbs. of molasses was fed with 3 lbs. of grain. The cows were fed 3 lbs. of molasses with 2 lbs. of grain in June. In July, the cows were fed 2.5 lbs. of molasses and 2 lbs. of grain. August through October, they were fed 2 lbs. of molasses with 2 lbs. of grain. This study concluded that animals fed molasses, along with pasture, resulted in loss of body condition, poor reproduction, decreased milk production, acidosis and foot health issues. Excessive sugar levels in the ration can cause extra unwanted production of butyric acid in the rumen resulting in poor rumen function, reduced feed efficiency, poor herd health and lost profit for the producer and can give results similar to a high starch ration. Higher starch levels would have helped to increase body condition and milk protein percentage as well as level out MUN levels. Excessively high starch levels in a ration can also cause loss in body condition, poor reproduction, acidosis and foot health issues when not balanced properly in the overall ration. I would recommend you consult with a nutritionist to make sure sugar and starch levels are appropriate for your herd.

Myth #3

Kelp is an excellent source of minerals and can fully meet daily mineral needs for dairy cows.

FACT: Kelp does contain many minerals, trace minerals, vitamins and other compounds that are very essential to keep animals healthy. However, the amounts of these minerals and vitamins in kelp, with the exception of Iodine and Vitamin A (if the kelp is fresh), are generally low and do not fully provide the animals with their daily requirements of minerals and vitamins. When you look at the analysis of Kelp vs. Alfalfa vs. Crystal-Min 2:1 (see

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Figure 2), kelp and alfalfa are very similar in relation to their mineral and vitamin levels. For many nutrients, a couple of extra ounces of alfalfa hay per head per day would match comparable levels that kelp provides. Crystal Kelp Meal is currently retailing for $38.75 for a 50# bag. If you would feed 3 oz. of kelp per head per day, that would equal $0.15/head/day. If you were to feed 3 oz. of a high quality alfalfa hay valued at 200 RFQ and $240/ton, that would only cost you $0.02/head/day. Since kelp and alfalfa are very similar in mineral and vitamin levels, you would be saving $0.13/head/day if you just fed just 3 oz. of a high quality alfalfa hay.

A mineral, such as our Crystal-Min 2:1, should be force fed to each animal each day to make sure they are getting their daily requirements to maintain production and herd health. Crystal-Min 2:1 should also be left out free choice as a safeguard to monitor ration and herd health changes. Force feeding the Crystal-Min 2:1 as well as leaving it out free choice, along with a balanced ration, will provide much of the daily requirements for vitamins and minerals. Kelp is not needed when the Crystal-Min 2:1 is used this way and the ration is well balanced. It will not hurt the animals if kelp is also fed with the Crystal-Min 2:1, but the kelp is not needed and can be a significant cost savings when the kelp is not fed. I am not saying kelp should not be used at all; it just needs to be used in the right way. There are many compounds in kelp that can be beneficial in keeping animals healthy; iodine, alginates, vitamin A, bromine, alginic acid and organic salts. These compounds play a role in helping to promote healthy growth of hair, enhance the immune system and regulate metabolism. Evaluating return on investment of these nutrients can be difficult. Feel free to talk with one of our nutritionists about what ration would be best for your herd's health, production and overall profitability.

Resources:
- Acadian Seaplants. *Kelp Meal.* Acadian Seaplants. Print.
- Dairy One. *Feed Composition Library.* Web. 12 August 2011.
- Hoffman, Karen. "Molasses Supplements to Grazing Dairy Cows-On Farm Case Study." http://grazingguide.net/. Web. 12 August 2011.
- Ritchason N.D., Jack. *The Little Herb Encyclopedia.* Third Edition. Pleasant Grove, Utah: Woodland Health Books, 1995. Print.
- Tucker, Bill. "Buffers and Acid/Base Balance in Dairy Cows." http://www.admani.com/. Web. 16 August 2011.

Figure 2

	Kelp Meal	Alfalfa Hay	CC 2:1 Mineral
Moisture	13.0%	9.1%	5.0%
CP	6.0%	21.3%	0.0%
Crude Fiber	6.0%	9.1%	0.0%
Ash	22.0%	10.6%	96.0%
Fat	3.0%	2.4%	0.0%
Carbohydrates	50.0%	30.6%	0.0%
Calcium	2.0%	1.2 - 2.0%	23.00%
Phosphorus	1.0%	0.27 - 0.4%	10.00%
Magnesium	0.8%	0.3 - 0.4%	5.00%
Potassium	2.0%	2.3-3.5%	0.00%
Chloride	2.0%	0.7%	0.00%
Cobalt	<1 ppm	0.37 ppm	33.0 ppm
Copper	5.5 ppm	9.01 ppm	770 ppm
Manganese	30 ppm	62.0 ppm	1,050 ppm
Molybdenum	<2 ppm	1.88 ppm	0.00 ppm
Iron	300 ppm	362.28 ppm	3,800 ppm
Sulfur	2.2%	0.27%	0.01%
Zinc	30 ppm	61 ppm	2,800 ppm
Selenium	3.5 ppm	1.09 ppm	30.0 ppm
Sodium	1.2%	0.14%	0.02%
Iodine	600 ppm	5.0 ppm	55 ppm
Cadmium	<1 ppm	<1 ppm	0.00 ppm
Aluminum	100 ppm		
Boron	90 ppm		0.00 ppm
Barium	32.5 ppm		
Beryllium	<1 ppm		
Chromium	1.5 ppm		
Florine			187.0 ppm
Nitrogen	1.3%		
Nickel	<1 ppm	<1ppm	
Lead	<1 ppm	<1ppm	0.00 ppm
Tin	<10 ppm		
Strontium	350 ppm		
Titanium	5.5 ppm		
Vanadium	4 ppm		
Vitamin A	594,626 IU/lb	112,590 IU/lb	400,000 IU/lb
Vitamin D			85,000 IU/lb
Vitamin E	153 IU/lb	100 IU/lb	1,100 IU/lb
Biotin	0.25 ppm	0.30 ppm	0.00 ppm
Folic Acid	0.3 ppm	2.6 ppm	0.00 ppm
Folinic Acid	0.3 ppm	2.0 ppm	0.00 ppm
Niacin	20 ppm	41.8 ppm	0.00 ppm
Riboflavin	7.5 ppm	15.5 ppm	0.00 ppm
Thiamin	3 ppm	3.9 ppm	0.00 ppm
Vitamin B12	<0.004 ppm	0.00 ppm	0.00 ppm
Vitamin C	1050 ppm		0.00 ppm
Vitamin K	<10 ppm		0.00 ppm
Alginic Acid	22.5%		0.0%
Mannitol	5.5%		0.0%
Laminarin	3.5%		0.0%
Other Sugars	21.0%	6 - 16%	0.0%

**** Based on information from NRC 2001, Feedstuffs 2011, DairyOne Online Feeds Library, and Acadian Seaplants***
***** All nutrient analysis of the ingredient is on a dry matter basis***