

The costs of nutrients and comparison of feedstuffs prices¹

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Just when we thought that corn was going to hit \$10/bu, the floodgate opened and corn prices have collapsed, followed shortly afterward by soybean prices and most other commodities. It is always so much easier to forecast commodity prices in the past compared to the future...

As usual in this column, I used the software SESAME™ that we developed at Ohio State to price the important nutrients in dairy rations to estimate break-even prices of all major commodities traded in Ohio, and to identify feedstuffs that currently are significantly underpriced. Price estimates of net energy lactation (NEI, \$/Mcal), metabolizable protein (MP, \$/lb – MP is the sum of the digestible microbial protein and digestible rumen-undegradable protein of a feed), non-effective NDF (ne-NDF, \$/lb), and effective NDF (e-NDF, \$/lb) are reported in Table 1. Compared to September 2008, the cost per unit of net energy is down considerably (-6.8¢/lb), MP is up (+7.5 ¢/lb), ne-NDF is up (18¢/lb), while e-NDF is slightly up (+0.3¢/lb). Compared to historical averages (i.e., since January 2005), NE_L is now priced just about at the average (10¢/lb). For MP, these figures stand at a premium of about 16.8¢/lb, or a 84 % premium over the 4 year average. Thus, although dietary energy has been traded at a very high premium in the last year, the recent fall in corn prices and “energy” feeds has resulted in somewhat “normal” energy prices in October. The cost of ne-NDF is currently discounted by the markets (i.e., feeds with a significant content of non effective NDF are price discounted), but the discount is at about the four year average. Meanwhile, unit costs of e-NDF are historically high, with a premium of about 5 ¢/lb over the 4-year average. Home-grown forages can be inexpensive sources of this important nutrient.

Table 1. Prices of dairy nutrients, Ohio, October 2008.

Estimate of Nutrient Unit Costs		
Nutrient name	Estimate	
NEI - 3X (2001)	0.091374	**
Metabolizable Protein (MP, g)	0.367676	**
ne-NDF	-0.055387	~
e-NDF	0.077138	~

- A blank means that the nutrient unit cost is likely equal to zero
- ~ means that the nutrient unit cost may be close to zero
- * means that the nutrient unit cost is unlikely to be equal to zero

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Based on mid October wholesale prices, central Ohio, feed commodities can be partitioned into the three following groups.

Bargains	At Breakeven	Overpriced
Canola meal	Alfalfa hay	Bakery byproducts
Corn, ground, shelled	41% Cottonseed meal	Beet pulp
Corn silage	Whole cottonseed	Blood meal
Distillers dried grains	Feather meal	Brewers grains, wet
Gluten feed	Hominy	Citrus pulp
Roasted soybeans	Soybean meal – expeller	Fish meal
Wheat middlings	Wheat bran	Gluten meal
		Meat meal
		Molasses
		48% soybean meal
		44% soybean meal
		Soybean hulls
		Tallow

As usual, I must remind the readers that these results do not mean that you can formulate a balanced diet using only feeds in the bargain column. Feeds in the “bargains” column offer savings opportunity and their usage should be maximized within the limits of a properly balanced diet. In addition, prices within a commodity type can vary considerably because of quality differences as well as non-nutritional value added by some suppliers in the form of nutritional services, blending, terms of credit, etc.

One must remember that SESAME compares all commodities at one point in time, mid October in our case. Thus, the results do not imply that the bargain feeds are cheap on a historical basis.

In Table 2 we report the detailed results for all 29 feed commodities. The lower and upper limits mark the 75% confidence range for the predicted (break-even) prices. Feeds in the “Appraisal Set” were either deemed outliers (completely out of price), or had an unknown price (e.g., alfalfa hay of different qualities).

Table 2. Actual, breakeven (predicted) and 75% confidence limits of 27 feed commodities used on Ohio dairy farm.

Calibration set					
Name	Actual [/T]	Predicted [/T]	Lower limit	Upper limit	Corrected
Alfalfa Hay - 44 NDF 20 CP	192.000	185.965	157.518	214.412	185.965
Bakery Byproduct Meal	245.000	203.426	181.437	225.415	-
Brewers Grains, wet	54.000	46.968	42.180	51.757	-
Canola Meal (2008)	198.900	240.900	229.659	252.142	-
Citrus Pulp dried	225.000	169.291	155.502	183.081	-
Corn Grain, ground, dry	181.420	207.494	187.269	227.720	-
Corn Silage, 32-38% DM	63.000	73.514	64.490	82.538	73.514
Cotton Seed Meal, 41% CP	305.000	289.567	273.160	305.975	-
Cotton Seed, Whole w lint	295.000	282.280	246.575	317.984	-
Distillers Dried Grains w Sol	150.000	232.877	214.778	250.977	-
Feathers Hydrolyzed Meal	455.000	472.752	445.139	500.365	-
Gluten Feed, dry	157.000	200.712	187.661	213.763	-
Gluten Meal, dry	539.000	493.603	463.919	523.287	-
Hominy	185.000	184.751	168.834	200.668	-
Meat Meal, rendered	405.000	364.617	344.881	384.353	-
Molasses, Sugarcane	200.000	144.552	125.932	163.173	-
Soybean Hulls	189.000	115.320	82.884	147.756	-
Soybean Meal, expellers	422.000	407.237	388.754	425.721	-
Soybean Meal, solvent 44%	283.300	296.285	283.095	309.474	-
Soybean Meal, solvent, 48	292.300	340.674	325.600	355.747	-
Soybean Seeds, whole roa	357.670	383.223	360.273	406.173	-
Wheat Bran	132.000	132.384	111.666	153.101	-
Wheat Middlings	125.000	152.343	134.470	170.215	-

Appraisal set			
Name	Actual [/T]	Predicted [/T]	Corrected
Alfalfa Hay - 38 NDF 22 CP	0.000	206.175	232.781
Alfalfa Hay - 48 NDF 17 CP	0.000	177.871	160.133
Blood Meal, ring dried	930.000	605.713	-
Fish Menhaden Meal, mech.	995.000	488.937	-
Tallow	690.000	457.661	-

We can use estimated nutrient costs to benchmark feeding costs. In fact, these estimates are used to calculate the Cow-Jones Index (**CJI**), an index constructed here at Ohio State to measure the difference between milk revenues and the costs of providing the required nutrients at a production level of 65 lbs/cow per day. The Cow-Jones is conceptually very similar to income-over-feed costs, but is calculated without making reference to any specific diet (Table 3).

Table 3. Calculation of the Cow-Jones Index (CJI), October, 2008.



Date:	Oct-08	
Animal inputs		
Cow weight (lbs)	1500	
Milk (lbs/d)	65	
Fat %	3.6	
Prot %	3	
Other solids %	5.7	
Milk component prices inputs		
Fat (\$/lb)	\$ 1.8507	
Protein (\$/lb)	\$ 3.5490	
Other solids (\$/lb)	\$ (0.0047)	
Nutrient costs inputs		
NE _L (\$/lb)	\$ 0.0914	
MP (\$/lb)	\$ 0.3677	
e-NDF (\$/lb)	\$ 0.0771	
ne-NDF (\$/lb)	\$ (0.0554)	
Nutrient Requirements Calculations		
NE _L (Mcal)	31.33	
MP (lbs)	4.64	
e-NDF (lbs)	10.15	
ne-NDF (lbs)	3.38	
Milk Income		
	\$/cow d	\$/cwt
Fat	\$ 4.33	\$ 6.66
Protein	\$ 6.92	\$ 10.65
Other solids	\$ (0.02)	\$ (0.03)
TOTAL	\$ 11.23	\$ 17.28
Nutrient Costs		
	\$/cow d	\$/cwt
NE _L	\$ 2.86	\$ 4.40
MP	\$ 1.71	\$ 2.62
e-NDF	\$ 0.78	\$ 1.20
ne-NDF	\$ (0.19)	\$ (0.29)
TOTAL	\$ 5.16	\$ 7.94
Income over nutrient costs		
	\$ 6.07	\$ 9.34
(Cow-Jones Index)		\$ 9.34

From this table, one can see that the cost of supplying the nutrients required to produce 65 lbs/d amounts to a sizeable portion of milk income. We currently estimate that it costs on an

average \$7.94/cwt (\$5.16/cow/day) – or close to 46% of the milk income - to provide all the nutrients required by a 1,500 lb cow producing 65 lbs of milk per day at 3.6% fat and 3.0% protein.

The last three months the Cow-Jones Index stood below the break-even threshold of \$8.00/cwt. The last time that we had seen that was in 2006... and we all remember how financially devastating was 2006 to our dairy industry. Thus, the \$2.54 rise in the CJI this month is certainly very welcome news. Approximately 70% of the increase came from reduced nutrient (feed) costs, and 30% from better milk (component) prices – especially milk protein.