

Economic Evaluation of Dairy Feeds: Using the FEEDVAL Spreadsheet

Guide D-207

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The FEEDVAL spreadsheet performs the following functions:

- Calculates cost per nutrient for any feed the user enters.
- Estimates a current market value per ton for a feed.

Data requirements:

- Nutrient content of the feed, including crude protein, net energy for lactation, total digestible nutrients (optional), dry matter, and rumen undegradable protein (optional).
- Current market costs of soybean meal and shelled corn.

Terms used in FEEDVAL:

DM = dry matter
CP = crude protein
TDN = total digestible nutrients
NEL = net energy for lactation
RUP = rumen undegradable protein

The purpose of the FEEDVAL spreadsheet is to provide a tool to economically evaluate feeds purchased off the farm. It compliments NMSU Extension Guide D-206, *Economic Evaluation of Dairy Feeds*,¹ which provides further discussion of economic evaluation of dairy feeds. By using this spreadsheet, a dairy producer can determine the value of by-products, concentrates, and forages based on competitive prices of corn and soybean meal. The spreadsheet operates on Microsoft Excel (.xls) or Lotus (.wk3 or .wk4). However, it can also be used on other modern spreadsheets. If you are having difficulties loading or using the spreadsheet, contact Greg Bethard at New Mexico State University (505-646-6404).

When you make entries in the spreadsheet, be sure that numbers are entered as numbers, not text. If a

number is entered as text, the spreadsheet assumes the value is 0. Numbers entered as text appear left justified in the cell. Therefore, be sure that all entered numbers appear right justified in the cell. The following example illustrates this point:

21.0	21.0
Incorrect	Correct

The value of the correctly entered cell is 21, the value of the incorrectly entered cell is 0. Also, be sure the percentages are entered as percentages. For instance, 30 percent dry matter must be entered as 30, not 0.30.

Objectives

FEEDVAL will determine:

1. Cost/nutrient.
 - a. cost/lb of crude protein
 - b. cost/Mcal of net energy
 - c. cost/lb of TDN
 - d. cost/lb of RUP
2. The value of any feed or forage based on the price of soybean meal and shelled corn.
3. The value of a selected commodity and by-product feeds based on the price of soybean meal and shelled corn.

Running the Program

1. Load the Lotus (FEEDVAL.WK3 or FEEDVAL.WK4) or Excel (FEEDVAL.XLS) version of the spreadsheet from your floppy disk or hard drive.
2. FEEDVAL consists of three sheets (see figs. 1–3). Excel numbers sheets numerically, and Lotus numbers sheets alphabetically. To move between sheets, click the sheet tabs at the bottom (Excel) or top (Lotus) of the screen. Sheet 1 contains directions for using FEEDVAL. Sheet 2 is where the feed values are entered.
3. At the top of Sheet 2, enter the current market prices for shelled corn and 44% soybean meal.

¹ For a copy of this publication, contact the Dept. of Agricultural Communications / New Mexico State University / Box 30003, MSC 3AI / Las Cruces, NM 88003-8003 / (505) 646-2701.

4. Enter values for feeds in question, as in the corn silage example in the spreadsheet (see fig. 2). All feed values must be entered, with the exception of TDN and NEL (one or both of these may be entered). Enter data only in shaded areas.
5. Results are given next to the entered feed values. The last column, value in price per ton, provides a value of a feed using soybean meal and shelled corn as a base of comparison. Calculation of this value requires NEL energy value; TDN will not work.
6. Sheet 3 provides values for specific feeds based on the soybean meal/shelled corn prices.

FEEDVAL can help a producer make feed purchasing decisions, but should not be the sole criteria. The following discussion identifies strong and weak points of each method of economic evaluation.

Cost/Nutrient Method

The cost/nutrient method is useful, but can be misleading. It is important to evaluate feeds based on their most valuable nutrient(s). For example, protein supplements such as soybean meal and cottonseed meal should be evaluated primarily on the basis of their crude protein content, because that is the most valuable nutrient in the feed (that is, the reason the feed is purchased). This does not mean the energy in protein supplements has no value and should be ignored. It simply shouldn't be emphasized as much as protein in that situation. Likewise, energy sources such as shelled corn and fat should be evaluated primarily on energy content. A feed like alfalfa haylage that can supply significant quantities of protein and energy to the total ration should be evaluated on protein and energy cost.

FEEDVAL does not consider palatability, digestibility, and quality of the feed source. A couple of extreme examples illustrate this point. First, consider dairy manure and soybean meal. Dairy manure is certainly a better buy in terms of cost per unit of protein or energy. However, palatability and digestibility are certainly different. Second, consider that on the basis of cost per pound of crude protein, soybean meal is usually a better buy than fish meal. However, fish meal has a high rumen undegradable protein (bypass protein) value, which adds value to the feed.

Cost/nutrient is most useful when comparing feeds of similar use and function.

Value/Ton

FEEDVAL provides a value per ton for a feed, given the prices of shelled corn and soybean meal. Shelled corn and soybean meal are readily available, widely used concentrate feeds in dairy rations throughout the United States. Shelled corn is a high energy concentrate, while soybean meal is a high protein concentrate. Specific equations determine value per ton for selected commodities, while simultaneous equations determine value per ton for any feed. The commodity equations are on Sheet 3 of FEEDVAL. Simultaneous equation results are given in the "value/ton" column adjacent to cost/nutrient results on Sheet 2.

The value/ton calculation represents the maximum worth of a feed, assuming it to be of equal palatability and digestibility as corn and soybean meal. If a feed is not a good buy, then you would be better off buying soybean meal and corn to supply your energy and protein needs. In the case of wet forages, these values are very liberal price estimates because it assumes the energy and protein of the forage in question to be worth the same as that in corn and soybean meal. This is rarely the case, as wet forages are generally not as marketable as concentrated feeds.

Figure 1. Sheet 1 of FEEDVAL spreadsheet (.xls version).

FEEDVAL will provide economic analysis of feeds. FEEDVAL consists of three sheets. To move between sheets, click the sheet tabs at the bottom of the screen. Sheet one is the current sheet, containing directions for using FEEDVAL. Sheet 2 is where the feed values are entered. At the top, shelled corn and 44% soybean meal prices are entered. Values for the feeds in question must be entered as in the corn silage example. For example, 9% crude protein must be entered as 9, NOT .09. All feed values must be entered, with the exception of TDN and NEL (one or both of these may be entered). Enter only in shaded areas. Results are given next to the entered feed values. The last column, value in \$/ton, provides a value of the feed in question using soybean meal and shelled corn as a base of comparison. Calculation of this value requires NEL energy value; TON will not work. Sheet 3 provides values for specific feeds based on the soybean meal/shelled corn prices.

The following is a glossary of terms used in FEEDVAL:

- DM = dry matter
- CP = crude protein
- TDN = total digestible nutrients
- NEL = net energy lactation
- RUP = rumen undegradable protein

Figure 2. Sheet 2 of FEEDVAL spreadsheet (.xls version).

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Shelled corn \$95 Only enter data in shaded areas!
Help on screen one.

44% Soybean Meal \$200

Feed	DM Basis					cost \$/ton	\$/lb CP	\$/Mcal NEL	\$/lb TDN	\$/lb RUP	Value \$/ton
	DM %	CP %	TDN %	NEL Mcal/lb	RUP % of CP						
1 Corn Silage (example)	35	8	70	0.68	31	25	0.45	0.05	0.05	1.44	27.73
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Figure 3. Sheet 3 of FEEDVAL spreadsheet (.xls version).

Feedval .xls

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44% Soybean Meal Cost = \$200.00 /TON Soybean meal and shelled corn
 Shelled Corn Cost = \$95.00 /TON prices from screen 2

Feed	DM %	CP %	NEL Mcal/lb	VALUE \$/CWT	VALUE \$/TON
ALMOND HULLS	90	4.4	0.58	2.75	54.95
BARLEY	89	13.9	0.87	5.10	101.95
BEET PULP	91	8.0	0.8	4.17	83.40
BREWERS DRIED GRAINS	92	26.0	0.68	6.33	126.51
BREWERS WET GRAINS	21	26.0	0.69	1.45	29.03
CITRUS PULP	91	6.9	0.80	3.96	79.17
CORN GLUTEN FEED	90	25.0	0.86	6.70	133.98
CORN GLUTEN MEAL	91	65.9	0.88	12.73	254.51
COTTONSEED HULLS	91	4.3	0.37	1.98	39.68
COTTONSEED MEAL	91	44.8	0.78	9.33	186.51
COTTONSEEDS	92	24.9	1.04	7.50	150.08
DISTILLERS GRAINS	92	29.5	0.86	7.68	153.52
EAR CORN	87	9.3	0.84	4.24	84.86
FISH MEAL	92	66.6	0.77	12.55	250.90
HOMINY	90	11.8	0.97	5.23	104.56
LINSEED MEAL	90	38.6	0.79	8.40	167.94
MOLASSES, BEET	77	8.7	0.78	3.4	68.12
MOLASSES, SUGARCANE	75	4.3	0.75	2.79	55.71
MEAT & BONE MEAL	94	53.8	0.75	10.84	216.73
OATS	89	13.6	0.79	4.78	95.52
RAPESEED MEAL	91	43.6	0.71	8.90	178.01
RICE HULLS	92	3.1	0.07	0.71	14.15
RYE	88	13.8	0.84	4.94	98.71
SOYBEAN HULLS	90	12.0	0.81	4.69	93.83
SOYBEANS	89	41.7	0.99	9.45	188.95
SUNFLOWER MEAL	93	50.3	0.87	15.55	311.10
WHEAT BRAN	90	18.0	0.7	5.03	100.52
WHEAT MIDLINGS	90	18.7	0.84	5.91	118.11
WHEAT, SOFT WINTER	89	11.5	0.92	4.96	99.21
WHEY	7	14.0	0.8	0.39	7.89

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