8-1-1996

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COOPERATIVE EXTENSION SERVICE
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Extension Extra

ExEx 2020
August 1996
Livestock & Dairy

SOUTH DAKOTA STATE UNIVERSITY / U.S. DEPARTMENT OF AGRICULTURE

Reducing Feed Costs: Is It Possible?

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Feed costs represent the major expense for almost every livestock operation. Consequently, feed costs are often the major defining factor between profit and loss or the overall profitability of the operation.

Feed costs fluctuate due to season, market demands, and extremes in weather conditions. Upward fluctuations in prices frequently cause producers to seek alternatives to traditional feeds in an attempt to control costs without sacrificing production. How good are these alternatives, then becomes the question, and here are some criteria to consider when evaluating alternatives:

- **Nutrient Composition**
  How well does the alternative feed meet the nutrient requirements for maintenance and/or production? Test or analyze all feeds before incorporating into a ration.

- **Handling and Storage**
  How will this feed be delivered, stored, and handled for feeding on the farm? Will new structures or equipment be necessary? Can existing facilities be modified?

- **Palatability**
  Not all feeds are equally palatable nor are all feeds fed with the same ease, i.e. grain mix, total mixed ration (TMR), etc. For instance, urea has an adaption period for feeding and can cause palatability problems, especially in humid or rainy weather.

- **Cost**
  What will be more economical? This is the most often asked question, especially when more traditional feeds increase in price.

In addition to these factors, it may be necessary to consider nutritional benefits not reflected in the price. This is especially true for dairy rations. An example of this is, in addition to energy and protein, a producer may want to look at the value that fiber in a feed may add to the ration, either as a positive or a negative.

One of the most useful ways to price and nutrient compare feeds is via computerized ration balancing programs. These programs calculate the opportunity prices of feeds relative to all feeds in the formulation with respect to the animal being fed. The data in Table 1 is one example of the type of information provided for pricing feeds using least-cost ration formulation. Least-cost formulations are used by producers to compare forages and concentrates most appropriate for given classes of livestock.

Table 1. Least-cost ration formulation opportunity costs.

	MIN	MAX	EXACT	UNIT	$/TON	OPPORTUNITY $/TON
Haylage	0.000	40.000	0.000	#/HD	35.00	0.00
Silage	0.000	20.000	0.000	#/HD	22.00	0.00
Alfalfa hay	0.000	8.000	0.000	#/HD	65.00	0.00
Barley	0.000	5.000	0.000	#/HD	85.00	0.00
Corn grain					115.00	0.00
Soybean meal-44					250.00	117.09
Dist grains, dry	0.000	2.000	0.000	#/HD	160.00	119.71
Whole beans	0.000	2.000	0.000	#/HD	200.00	131.31
Magnesium oxide	0.100	10.000	0.000	#/HD	380.00	0.00
Dynamate	0.080	0.090	0.000	#/HD	440.00	0.00
Vitamin E					500.00	0.00
Vit ADE premix					1000.00	0.00
Limestone					80.00	16.99
Dical-18% P					440.00	0.00
Sodium bicarb	0.000	0.000	0.250	#/HD	350.00	0.00
TM salt	0.120	12.000	0.000	#/HD	180.00	0.00

In this example, soybean meal valued at $250/T is worth only $117.09/T to feed relative to the other feeds, forages, and concentrates in the ration. This is due primarily to the quantity and quality of alfalfa in the ration. Distiller's grains valued at $160/T relative to all other feeds including soybean meal is worth only 119.71/T to feed. Least-cost ration evaluations are available via your county and state Extension offices.

Table 2. Chemical composition and price equations for various feeds.

Feed	Composition DM (%)	CP (%)	NEL (Mcal/kg)	NDF (%)	EE (%)	Equation
Corn	89	10.0	1.84	9	4.3	
SBM	89	49.9	1.94	14	1.5	
Barley	88	13.5	1.94	19	2.1	(0.943X + 0.125Y)*DM
Beet pulp	91	9.7	1.78	54	.6	(1.011X - 0.022Y)*DM
Blood meal	92	87.2	1.50	—	1.4	(-1.197X + 2.222Y)*DM
Canola meal	92	44.0	1.72	36	1.2	(-0.042X + 0.9984)*DM
Corn gluten feed	90	25.6	1.91	45	2.4	(0.647X + 0.437Y)*DM
Corn gluten meal	90	67.2	2.06	14	2.4	(-0.357X + 1.568Y)*DM
Cottonseed (linted)	92	23.0	2.22	44	20.0	(0.915X + 0.381Y)*DM
Meat/bonemeal	93	54.1	1.63	—	10.4	(- 0.253X + 1.273Y)*DM
Oats	89	13.3	1.77	32	5.4	(0.835X + 0.140Y)*DM
Soyhulls	91	12.1	1.76	67	2.1	(0.910X + 0.089Y)*DM
Wheat	89	6.0	2.04	—	2.0	(1.085X + 0.042Y)*DM

All values expressed on dry matter basis: CP = crude protein, NEL = net energy for lactation, NDF = neutral detergent fiber and EE = ether extract (NRC, 1989). Price equation based on composition of feeds from NRC (1978); X = price of corn ($/unit) and Y = price of soybean meal ($/unit).

Another way to cost compare feeds is to value the key nutrients. Energy and protein are the two key nutrients usually considered when pricing feeds, especially for lactating dairy cattle. M.L. Eastridge, Ohio State University, has developed some equations to allow for easy comparison of feeds. These equations allow comparative feed-value determination based on levels of crude protein (CP) and net energy lactation (NEL).

Corn and soybean meal (44% CP) are used as based feeds with constants developed on a dry matter basis and adjusted to an as fed basis.

The pricing equations for feeds common to this region are presented in Table 2.

For example,use the equation from Table 2 to calculate the comparative dollar value of oats, assuming you purchase corn for $110/T and soybean meal at $240/T. Remember in the equations, "X" represents corn, "Y" soybean meal.

(0.835X + 0.140Y)*DM = comparative price
(0.835 X $110/T + 0.140 X $240/T) X .89 = $111.65/T for oats

Regard this value and all values calculated from Table 2 as the maximum price to be paid for feeds based on their crude protein and net energy lactation content. If the price of the feed is lower than the calculated value, then the feed would be an economical replacement for corn or soybean meal in the ration. If the cost of the feed is above the calculated value, then corn, soybean meal, or other feeds at a price below the calculated feed value would be more economical sources of crude protein and energy.

A third way to value feeds, especially protein supplements, would be a direct comparison of the feeds on a cost per unit of crude protein basis. The following is an example of such a comparison:

$/unit CP = ($/unit feed)/(unit of feed X %DM X %CP)

If soybean meal were $240/T and distiller's grain $160/T then the comparison would be:

$240/T divided by 2000 pounds X .89 X .499 = $0.27/lb. CP
$160/T divided by 2000 pounds X .94 X .23 = $0.37/lb. CP

In this case, although the cost per ton of SBM is higher than the distiller's, the price per pound of protein is $0.10 less per pound making the SBM a more economical purchase.

Use of information presented here, in one form or another, will allow you to calculate the comparative value of a specific feed relative to corn and soybean meal and to assess the economic impact of the inclusion of this feed in the ration. However, keep in mind that there may be alternative nutritional factors to consider when formulating rations.

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650 copies printed by CES at a cost of 7 cents each. August 1996.