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# Dairy Guidelines

COOPERATIVE EXTENSION SERVICE, V.P.I., BLACKSBURG, VIRGINIA

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## Economics in Balancing Dairy Rations

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Is a 16% protein concentrate mix always right for your herd? The answer is No. It may be right for some of your cows some of the time but you are losing money if you feed it to all of the cows all of the time.

The main reason to feed concentrates is to provide energy and protein to supplement that in the forage. Since different forages have different amounts of energy and protein, the concentrate mixes should also have different proportions. Therefore, a 16% protein concentrate is not always right.

Forages from Virginia farmers, analyzed in the V.P.I. Forage Testing Laboratories, show a decided difference in nutritive value. Also, there were wide variations in the values within the different forages. Because of this variation, dairymen should have samples of their own forages analyzed so as to match the right concentrate mix with the forage.

Farmers can increase their profits by matching their concentrate mix with their forage. Over-feeding protein is expensive. A pound of digestible protein from a mix of corn and soybean oil meal costs about 10¢. Feed an extra 1/2 lb. of digestible protein a day per cow for 200 days in the winter and you have lost \$10. Feed it to 50 cows and you have thrown away a \$500 trip to Florida for you and your wife.

Average Composition of Forages - 1966-67

	No. of samples	Dry matter (%)	Net energy (therms)	Total dig. nutrient (%)	Total protein (%)	Dig. protein (%)
<u>Silages</u>						
Corn	1187	34.6	18.6	23.2	2.8	1.5
Sorghum	48	27.3	13.2	16.5	2.4	1.3
Alfalfa-ladino clover	66	40.8	17.4	21.4	4.3	2.3
Barley	27	41.8	18.1	22.3	4.2	2.3
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<u>Hay</u>						
Alfalfa	93	85.4	38.5	49.7	14.7	10.5
Fescue	152	83.4	35.3	46.4	8.6	5.1
Orchardgrass	111	87.8	37.5	49.5	8.7	4.6
Alfalfa-orchard- grass	70	86.7	37.2	49.0	12.0	8.4

The same thing can happen when the cows are on high quality pasture. Good pastures have more protein per pound of dry matter than any other forage. Therefore, when cows are on good pasture the protein in the concentrate should be reduced. A 13% concentrate mix will be more nearly correct. Low producing cows may need nothing but corn.

Note that you can reduce protein on good pastures. Dried-up pastures in the summer are often little more than exercise lots. If this is the case on your farm, then the concentrate will have to provide all of the protein. The ration then may need to contain up to 22% protein.

Underfeeding protein also is expensive. A cow cannot perform her best if she is protein starved. Corn silage is extremely low in digestible protein and a 16% protein concentrate mix will not provide enough protein. Production will

be reduced. It takes about 18% to 22% crude protein in the concentrate to balance the ration. Feed a 16% mix with corn silage and there goes another trip to Florida.

However, add 10 lbs. of urea to each ton of corn silage and a 16% mix is then too rich in protein. A 13% concentrate mix may be more nearly right.

When good alfalfa hay is fed, a 16% mix is probably about right. But if both hay and silage are fed, you will need to do some calculating.

It is also important to feed the right amount of energy feeds. However, a mistake here might not be as costly as a mistake with protein for a couple of reasons. One is that the energy in concentrate feeds costs only about 2 to 2.5¢ per pound. The other is that Bossy has a built-in compensator if you make a mistake. When she is underfed on energy she partially makes up for it by taking fat from her back. If you overfeed she will store it as fat for later use. She cannot do this with protein.

Do not lose that \$500 again this year. Balance your concentrate mix to match your forage program. It will take less than a half a day and where else could you make \$500 in a half day? Here is how you can do it.

First - Send samples of your hay and silage to V.P.I. to get a test. (30 minutes).

Second - Measure (do not guess) how much hay and silage you feed each cow per day (another 30 minutes).

Third - Use V.P.I. Dairy Guidelines Series 105 A Guide for Feeding Dairy Cows and calculate the protein needed in your concentrate mix. (This might take a little more time and you might ask your Extension Agent, Agriculture, or Extension Agent, Farm Management, to help you the first time.) (3 hours including driving to town and back.)

Fourth - Feed relative to your own calculations.

This is a relatively simple procedure when cows are in a lot. It is not so simple when they are on pasture. You will have to estimate their forage consumption. Your D.H.I.A. records will help.

The following concentrate mixes should cover the variety of conditions mentioned. Some of the mixes have urea and some do not. In every case the urea mix is cheaper and thus more profitable. A word of caution--if you have urea in your silage do not feed a concentrate mixture that contains urea. Generally farmers can save considerable dollars by having mixed a simple formula like one of these rather than buying a complete commercial mix. Always compare the cost of these mixes with other mixes you could use. Hauling, grinding and mixing costs are included. Local prices will be different than these, but costs can be calculated.

Suggested Concentrate Mixtures and Estimated Cost Per Ton										
Ingredient	Percent Crude Protein									
	13	13	16	16	18	18	20	20	22	22
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Gr. shelled corn (8.7% C.P.)	843	885	759	837	700	785	643	730	590	670
Oil meal (44% C.P.)	130	82	214	125	273	175	330	230	383	290
Urea (281% C.P.)	-	6	-	11	-	13	-	13	-	13
Salt (trace-mineralized)	10	10	10	10	10	10	10	10	10	10
Dicalcium phosphate	17	17	17	17	17	17	17	17	17	17
Vit. A & D	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
Total pounds	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Cost per 1000 <sup>2/</sup>	\$32.73	31.70	34.83	32.92	36.30	34.24	37.73	35.55	39.00	37.05
Cost per ton	\$65.46	63.40	69.66	65.84	72.60	68.48	75.46	71.10	78.00	74.00

1/ The final mixture should also include one or more vitamin supplements that will add 3000 I.U. of Vitamin A and 4000 I.U. of Vitamin D per pound of mix.

2/ Prices used are: Shelled corn @ \$1.40/bu., oil meal @ \$5/cwt., urea @ \$5.50/cwt., salt @ \$3/cwt., dicalcium phosphate @ \$5/cwt., and grinding, mixing, and hauling @ \$5/T. Vitamin cost is about \$2/T.

Many farmers who have followed the above suggestions have reported that they have increased their profit by more than \$1000 a year.