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Dairy Guidelines

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Using Wheat or Soybeans in the Dairy Ration

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I. Wheat for dairy cows.

1. Wheat equals shelled corn in digestibility and net energy content and is higher in protein than corn. You can, therefore, pay at least an equal price per 100 lbs. or per ton.

FEEDS AND FEEDING, 22nd Edition	Total Protein	Digestible Protein	Net Energy
Wheat (soft winter)	10.2	8.6%	80.1
Wheat (avg. of all types)	13.2	11.1%	80.0
Shelled Corn (No. 2)	8.7	6.7%	80.1
Corn and Cob	7.4	5.4%	72.1

2. When comparisons are made on a net energy basis without considering protein content, the relative prices below apply.

A bushel of wheat on the average weighs 60 lbs. A bushel of shelled corn on the average weighs 56 lbs. This means that when corn costs a given amount, you can pay 4/60 or 7% more for a bushel of wheat, even without any value for the additional protein. (Corn price plus 7%)

Example:	Shelled Corn Price Per Bu.	Comparable Wheat Price Per Bu.	Shelled Corn Price Per Bu.	Comparable Wheat Price Per Bu.
	\$1.00	\$1.07	\$1.60	\$1.71
	\$1.20	\$1.28	\$1.80	\$1.93
	\$1.40	\$1.50	\$2.00	\$2.14

3. If you are figuring your exact protein requirements you can afford to pay more for wheat than indicated in number 2 because you would require less protein supplement:

Example: (Based on Dairy Guidelines Series 107 method of computing)

Shelled Corn Price Bu.	Soft Winter Wheat Price Comparable to Corn At These Soybean Oil Meal (44%) Prices					
	\$4.50/cwt.	\$5.00/cwt.	\$5.50/cwt.	\$6.00/cwt.	\$6.50/cwt.	
Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	
\$1.00	1.17	1.19	1.21	1.21	1.22	
\$1.20	1.35	1.38	1.40	1.42	1.42	
\$1.40	1.54	1.56	1.59	1.62	1.64	
\$1.60	1.78	1.80	1.80	1.81	1.84	
\$1.80	1.97	1.99	2.02	2.02	2.02	

4. Wheat can be substituted equally for corn if it is cracked or rolled. However, because of its pasty nature when ground, it is best that wheat make up no more than 1/3 to 1/2 of the concentrate mix in this form.

II. Soybeans for dairy cows.

1. Soybeans are higher in energy and protein than shelled corn. Also, a bushel of soybeans weighs 60 lbs., or 7% more than a bushel of shelled corn which weighs 56 lbs. They are, therefore, useful for dairy cattle feed even when selling at a higher price per 100 lbs. than corn. The higher energy results mostly from a higher fat content compared to corn. It is questionable if dairy cattle can efficiently utilize over 6% fat in the total ration.

	% Total Protein	% Digestible Protein	Therms Net Energy	% Fat
Soybean Seed	37.9	33.7	87.6	18.0
Soybean Oil Meal (44%)	45.7	42.0	79.6	1.3
Shelled Corn (No. 2)	8.7	6.7	80.1	3.9
Corn & Cob	7.4	5.4	72.1	3.2

2. Soybeans are much higher in protein than shelled corn and, with a favorable price, can supply the needed protein in the ration. Prices of soybeans which would justify their substitution for corn and soybean meal on both a net energy and a protein basis in the ration are as follows:

Example: (Based on Dairy Guidelines Series 107 method of computing)

Soybean Seed Price Comparable to Corn Price
At These Soybean Oil Meal (44%) Prices

Shelled Corn Price/Bu.	\$4.50/cwt. Per Bu.	\$5.00/cwt. Per Bu.	\$5.50/cwt. Per Bu.	\$6.00/cwt. Per Bu.	\$6.50/cwt. Per Bu.
\$1.00	\$2.40	\$2.62	\$2.86	\$3.06	\$3.29
\$1.20	\$2.46	\$2.69	\$2.91	\$3.15	\$3.35
\$1.40	\$2.52	\$2.75	\$2.98	\$3.21	\$3.44
\$1.60	\$2.63	\$2.86	\$3.06	\$3.29	\$3.52
\$1.80	\$2.70	\$2.92	\$3.15	\$3.35	\$3.58

3. Ninety-two lbs. of rolled or cracked soybeans could be substituted for 100 lbs. of cracked corn on an energy basis. However, because of their high fat, pasty and laxative nature, and their tendency to reduce vitamin A utilization, it is best that ground soybeans make up no more than 1/4 to 1/3 of the concentrate mix. One-fourth soybeans and 3/4 shelled corn will provide a mix containing about 16% total protein and 82 therms per cwt. net energy.
4. Precaution: Crushed or ground soybeans become rancid and unpalatable in 3 to 5 days in warm weather. In cold weather this is no problem, but in warm weather, it calls for frequent crushing or grinding.

III. Special instructions to maintain coarse texture:

Dairy cows like coarse textured feeds. Therefore, keep all concentrate mixes from being too fine in nature. Ground corn, wheat, or soybeans, tend to become rather fine. Some crushing or cracking is necessary, however, to increase digestion. Adding oats also improves texture, but they are usually more expensive.