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Feeding Wheat to Beef Cattle

Michigan Beef Production

Michigan State University Extension Service

John C. Waller and Harlan D. Ritchie, Department of Animal Science

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# MICHIGAN BEEF PRODUCTION

COOPERATIVE EXTENSION SERVICE • MICHIGAN STATE UNIVERSITY

## Feeding Wheat to Beef Cattle

John C. Waller and Harlan D. Ritchie  
*Department of Animal Science*

### Nutrient Content

Table 1 compares the nutrient content of wheat and shelled corn to the nutrient requirements for a 600-lb. feedlot steer. For all practical purposes, energy values for wheat and corn are equivalent. As is true of all grains, wheat and corn are both low in calcium and relatively high in phosphorus. Corn has a moderate level of vitamin A activity, unless it has been stored for a long period of time. Wheat has no vitamin A activity.

The important advantage wheat holds over corn is its higher protein content. Depending upon the type, variety and where it is grown, wheat may range from 11 to 16% in crude protein. Most Midwest wheat averages around 12% crude protein, which is high enough to satisfy the minimum requirement of yearling feedlot cattle. Shelled corn, on the other hand, rather consistently averages about 10% crude protein, which falls short of the steer's requirements.

Table 1. Nutrient Content of Shelled Corn and Wheat Versus Steer's Requirement.

Item	Nutrient Content		Requirement of 600-lb. Feedlot Steer
	Shelled Corn	Wheat	
TDN, % of DM	91	88	70-86
Net energy (gain), Mcal/lb DM	.67	.68	.43-.62
Crude protein, % of DM	10	11-16	12
Calcium, % of DM	.02	.06	.40
Phosphorus, % of DM	.35	.40	.30
Vitamin A, IU/lb. DM	600-800	---	1000

### Feeding Value

To bring corn up to the crude protein level of wheat, it would take 6 lb. of soybean meal (44% CP) and 94 lb. of corn to equal 100 lb. of wheat.

Using this relationship as a guide, Table 2 lists prices at which wheat could be economically substituted for corn and soy.

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**Table 2. Prices at Which Wheat Could be Substituted for Shelled Corn and Soybean Meal.<sup>a</sup>**

Soy price \$/T.	Corn price, \$/bu.				
	\$2.00	\$2.50	\$3.00	\$3.50	\$4.00
	Wheat price, \$/bu.				
200	2.38	2.88	3.38	3.89	4.39
250	2.47	2.97	3.47	3.98	4.48
300	2.56	3.06	3.56	4.07	4.57
350	2.65	3.15	3.65	4.16	4.65
400	2.73	3.24	3.74	4.25	4.74

<sup>a</sup> 94 lb. shelled corn + 6 lb. soy = 100 lb. wheat (12% CP).

For feedlot cattle weighing over 600 lb., NPN products such as urea may be substituted for soybean meal. One lb. of urea contains roughly the same crude protein equivalent as 6 lb. of soybean

meal. Table 3 lists prices at which 100 lb. of wheat could economically replace 99 lb. of corn and 1 lb. of urea in a feedlot diet.

**Table 3. Prices at Which Wheat Could be Substituted for Shelled Corn and Urea.<sup>a</sup>**

Urea price, \$/T.	Corn price, \$/bu.				
	\$2.00	\$2.50	\$3.00	\$3.50	\$4.00
	Wheat price, \$/bu.				
200	2.18	2.71	3.25	3.77	4.30
250	2.19	2.73	3.26	3.79	4.32
300	2.21	2.74	3.28	3.80	4.33
350	2.22	2.76	3.29	3.82	4.35

<sup>a</sup> 99 lb. shelled corn + 1 lb. urea = 100 lb. wheat (12% CP).

Most commercial supplements are a blend of protein sources. They contain from 32 to 80% crude protein, depending upon the level of NPN used. To bring corn up to 12% CP, they would

need to be added at rates of from 3 to 9 lb. per 100 lb. of mix. Using these rates, break-even prices for wheat, like those shown above, could be easily computed.

### Precautions in Feeding Wheat

There is more risk in feeding wheat than in feeding corn. When wheat is fed at high levels, acidosis and rumen upset may occur, resulting in cattle going off-feed, reduced performance, founder, etc. It is generally recommended that wheat should not make up more than 40% of the total ration on a dry matter basis.

For best results, wheat should be either rolled or coarsely ground. Extremely fine grinding will

result in separation of the fines in dry rations, causing reduced intake and increased secondary fermentation in the feedbunk. Whole wheat is consumed well, but is not quite as completely digested as rolled or ground wheat.

When cattle are started on wheat, it should be done more slowly than with corn. They should be gradually brought up to full feed over a 25- to 30-day period of time.

### Sprouted Wheat

Research at Washington State University has shown sprouted wheat to be essentially equal to sound wheat for feedlot cattle. However, work at Michigan State University has shown that palatability may be a problem, resulting in reduced dry matter intake if sprouted wheat makes up more than 20% of the total ration dry matter.

Sprouted wheat should be rolled before feeding to cattle.

Sprouted wheat may also be ensiled with corn silage. When ensiled, it does not have to be rolled. However, no more than about 200 lb. of sprouted wheat dry matter should be added per ton of fresh corn silage.