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Wheat as a livestock feed

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no. 1.600

Quick Facts

- Wheat is a good livestock feed and should be considered as a feed grain when priced competitively with corn or milo.
- Wheat can replace corn or milo, amount for amount in the swine ration.
- Wheat can make up all of the grain portion of a hog ration until hogs weight about 100 pounds (45 kilograms).
- Pigs above this weight should not receive a ration composed of more than 50 percent wheat for maximum growth and feed efficiency.
- For maximum value as a cattle feed, wheat should be used in high roughage rations.
- At the present time, flaking or other methods of processing wheat do not appear to be superior to grinding wheat for cattle rations.

Feeding wheat to livestock is not new, but the price of wheat seldom has been competitive with the traditional feed grains such as corn and milo. However, for sometime wheat has been competitively priced with other feed grains and in some instances has been the most economical feed source.

Wheat compares favorably, and in some cases is nutritionally superior, to more traditional feed grains (see Table 1).

Table 1: Nutrient composition of wheat and feed grains.*

	Wheat	Milo	Corn	Barley	Millet
Crude protein %	10.0-15.0	7.0-10.0	9.0	10.5	11.0
Crude fiber %	2.7	2.2	2.0	6.0	5.0
Fat %	1.6	2.8	3.9	2.0	4.0
Calcium %	.05	.05	.02	.08	.05
Phosphorus %	.40	.35	.30	.40	.28
TDN (pigs) %	80.0	78.0	80.0	73.0	75.0
Ruminants	80.0	72.0	80.0	74.0	75.0
Net energy (meg. cal/100 lbs** air dry feed)					
Maintenance	86	68	86	76	None
Production	56	40	56	48	reported

*Composition was taken from the NRC publication "Nutrient Requirements of Swine and Beef Cattle."

**To convert to metrics, use the following conversion: 1 pound = .45 kilogram.

There is considerable variation in the protein content of wheat. This must be taken into consideration when formulating a ration containing wheat for beef cattle. This variation does not need to be considered when balancing a swine ration.

There also are many different varieties and types of wheat. The information contained in this Service in Action sheet applies specifically to hard red winter wheat that is characteristic of the High Plains area.

Wheat as a Swine Feed

Researchers at CSU have been experimenting with wheat as a swine feed since 1968. It has been learned that wheat compares favorably with corn or milo as a swine feed.

Wheat should be considered as an energy source for hogs and can replace corn or milo in the ration, amount for amount. The high protein content of wheat can be disregarded in the substitution.

An assigned value of nine percent crude protein can be used for corn, milo and wheat when balancing a ration. If a higher protein value is assigned to wheat, the amount of protein supplement required in the ration would be reduced. This in turn will reduce the amino acid levels in the ration. Lower amino acid levels will

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adversely affect animal growth and feed efficiency.

Wheat can make up all of the grain portion of the ration for hogs until they weigh about 100 pounds (45 kilograms) without affecting growth or feed efficiency.

Pigs will not perform as well on an all wheat ration after they have reached 100 pounds (45 kg). Tests at CSU indicate that, for the best rate of gain and feed efficiency after 100 pounds (45 kg) pigs should be fed a ration composed of half wheat and half milo with soybean oil meal included as the protein supplement.

Pigs fed the ration described in Table 2 have performed better than when fed an all milo or all corn ration during the entire growing-finishing period.

Table 3 gives the relative value of wheat compared with other feed grains as a feed for hogs. This information is based on research conducted at CSU.

Wheat as a Cattle Feed

The higher protein content of wheat over other feed grains should be recognized when formulating cattle rations.

For maximum feed value, wheat should be used in high roughage rations.

If wheat is used in high concentrate rations, the following points should be considered:

- Wheat starch ferments rapidly causing digestive disturbances such as acidosis. This condition usually will result in decreased pH of the rumen content and greater ruminal volatile fatty acid concentration. (pH is an expression of acidity or alkalinity. A low pH value indicates an acid condition.) There also will be a decrease in propionic acid with an increase in butyric acid and an increase in lactobacilli and other aciduric bacteria.
- Lower feed intake can be expected if wheat is the only grain in the concentrate portion of the ration. If it is fed at a rate so that it does not replace more than 50 percent of the grain, it probably will not affect feed intake.
- Reports indicate that feeding wheat may increase the number of liver condemnations. This has not been substantiated by a sufficient number of tests.

At the present time, flaking or other methods of processing wheat do not appear to be superior to grinding wheat for cattle rations.

Table 4 indicates the amount that can be paid for wheat as a livestock feed at differing protein levels. A 40-percent protein at \$100 per ton (907 kg) and corn at \$2.60 per hundred has been used in the calculations. This table takes into consideration the protein supplemental as well as energy value of wheat.

Table 2: Composition of swine ration utilizing wheat and milo.

Ingredient	Percent In Ration	
	16% Protein	14% Protein
Wheat	36.30	39.20
Milo	36.07	39.07
Soybean oil meal	20.0	14.0
Dehy alfalfa	5.0	5.0
Calcium carbonate	.5	.5
Di calcium phosphate	1.5	1.5
Vitamin premix*	.25	.25
Trace mineral premix	.15	.15
Aurafac 10	.20	.10

*Supplies per pound of ration 1,250 IU of vitamin A, 250 IU vitamin D, 10 mcg vitamin B-12, 5 mg of pantothenic acid, and 7.5 mg of niacin.

Table 3: Relative value of feed grains for swine rations.

Grain	Relative value %	Percent to be used as grain portion of ration %	Relative dollar value with corn at \$2.50/hundred weight	
			cwt.*	bushel*
Corn	100	100	\$2.50	\$1.40
Wheat	100	50	2.50	1.50
Milo	95-97	100	2.37	1.36
Barley	90	100	2.25	1.08
Millet	95	100	2.37	1.30

*To convert to metrics, use the following conversions: 1 pound = .45 kilogram; 1 bushel = .04 cubic meter.

Table 4: Maximum price for wheat as a livestock feed at various protein levels; corn \$2.60 per hundred and 40% supplement \$100 per ton.

Percent protein in wheat	Replacement value of wheat		Maximum price for wheat per hundred
	Pounds* corn 10% protein	Pounds* supplement 40% protein	
10%	100.0 lbs*	0.0 lbs*	\$2.60
12	93.3	6.7	2.76
13	90.0	10.0	2.84
14	86.7	13.3	2.92
15	83.3	16.7	3.00

*To convert to metrics, use the following conversion: 1 pound = .45 kilogram.