

Wheat for Poultry



Irving J. Mork
Poultryman

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No. 529

COOPERATIVE EXTENSION SERVICE
NORTH DAKOTA STATE UNIVERSITY
FARGO, NORTH DAKOTA 58102



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WHEAT FOR POULTRY

Wheat is a major ingredient of poultry rations in many areas of the world. However, its use since the late 1940's has been greatly curtailed in the U.S. due to an unfavorable cost relationship to other grains. In recent years, feedgrade wheat has been competitively priced with other feedstuffs and therefore has received renewed attention.

Wheat is relished by poultry. Work done by Washington State University showed that turkeys fed corn, wheat, oats and barley free choice preferred wheat by a large margin. Turkey toms ate 41.4 per cent of the ration as wheat while the hens ate 48.2 per cent wheat. Laying pullets ate 58 per cent wheat, 12 per cent corn, 9 per cent oats and 21 per cent of a high protein mash when the rations were fed free choice.

Wheat has a higher protein content than corn. Corn has a higher energy value than wheat.

Table 1. Protein and Calorie Value of Three Common Feed Grains

	Protein	Metabolizable calories per pound
Barley	12 per cent	1,260
Corn	9 per cent	1,535
Hard Red Wheat	14 per cent	1,405

Wheat is low in vitamin A. A ration using wheat as the grain part should be fortified with vitamin A. The following table gives the recommended vitamin A needed per pound of total ration. Other vitamins, with few exceptions, are present in amounts equal to or greater than in corn.

Table 2. USP Units Vitamin A Per Pound Total Ration

	Prestarter	Starter	Grower	Finisher	Laying & Breeder
Chickens		4,000	3,000	3,000	4,000
Turkeys	5,000	5,000	3,000	3,000	5,000

Value of Wheat Compared with Corn for Poultry Feed

Because of the wide variation in protein content of both hard red spring and durum wheats, a protein test should be run on the grain before it is to be used in formulation of a ration. In 1967, the range of protein content of North Dakota hard red spring wheat was from approximately 10% protein to 18%. Durum ranged from approximately 10% protein to 19%. The average for hard red spring was 14.2% protein. Durum averaged 13.2% protein.

Wheat has an average metabolizable energy value equal to 92 per cent of the value of corn. Wheat contains more protein than corn. Wheat protein figured at 14 per cent compared with 9 per cent for corn is worth about 15 cents more per 100 pounds under present soybean oilmeal prices.

If corn is worth 2 cents per pound, then wheat is worth 1.84 cents per pound (.92 x 2 = 1.84) on an energy basis. 1.84 cents per pound plus 0.15 cents per pound equals an energy plus protein bonus value of 1.99 cents per pound, or \$1.99 per 100 pounds, as compared with \$2.00 per 100 pounds for corn.

Caution - When figuring wheat-corn value, use 92 per cent of the corn price per pound or 100 pounds and add a constant 0.15 cent per pound or 15 cents per 100 pounds. The above formula may be on the conservative side when using wheat in a laying hen ration.

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Table 3. NDSU 1967 comparison of corn, barley, durum, sprouted durum, hard red spring wheat and millet when used in laying hen rations

	Corn	Barley	Red Spring Wheat	Durum	Durum Sprouted	White Millet	Grain By-product
% Egg Production	64.59	70.43	65.18	69.76	64.07	64.59	69.41
Feed Per Doz. Eggs	4.88	5.00	4.99	4.67	5.01	5.24	4.96
Hen-day Feed-lbs. per hen Consumption	.261	.293	.271	.271	.266	.283	.289
Interior Egg Quality (Haugh Units)	76.46	77.48	78.89	77.43	79.14	75.97	77.76
Hen Body Weight-lbs.	4.15	4.19	4.05	4.09	3.95	4.16	4.22
% Large Egg Produced*	83.76	81.08	72.27	79.95	74.83	85.70	81.73

*All the cereal grains used except millet gave a smaller percentage of large eggs than did corn.

Turkeys

Recent research indicates that wheat is equal to corn for feeding turkeys when these grains are used according to their nutrient composition. Often wheat is superior to corn in terms of feed cost per unit of final product.

Feeding trials conducted at the University of Arkansas indicate there was no significant difference in the value of wheat, corn or milo when fed on the basis of their nutrient composition in properly balanced feeds.

Table 4. Feed consumption and utilization of large white turkeys (males and females) fed corn, wheat and milo.

Grain source	Feed/Grain ratio				Avg.	Total feed consumption (lb.)
	0-6 wk.	6-12 wk.	12-18 wk.	18-23 wk.		
Corn	1.87	2.38	3.14	5.53	3.21	60.21
Wheat	1.83	2.24	3.24	6.18	3.23	60.12
Milo	1.82	2.33	3.59	5.84	3.38	62.04

Arkansas

Table 5. Body weight of large white turkeys (males & females) fed corn, wheat and milo (pounds).

Grain Source	Age (weeks)			
	6	12	18	23
Corn	2.3	7.8	14.1	18.4
Wheat	2.4	7.9	14.4	18.6
Milo	2.5	7.7	13.9	18.7

Arkansas

Shrunken, Frozen and Sprouted Wheat

Work by the North Dakota Agricultural Experiment Station in the '30s indicated that shrunken wheat was as good as whole wheat when measured by egg production, mortality, weight of eggs and hatchability. Shrunken and shriveled wheat contained a higher percentage of protein than did plump wheat. Energy values were not compared.

Work in Canada with normal frozen, frozen sprouted and sprouted moldy wheat showed little difference in the metabolizable energy content of the various samples. The following table summarizes the Canadian research:

Table 6. Metabolizable energy content of sound and damaged wheat

Wheat	Grain per chick gm.	Feed per chick gm.	Protein per cent	Metabolizable Energy per pound	Dry Matter per cent
Sound wheat	212	427	12.8	1,394	91.0
Sprouted wheat	215	430	12.1	1,385	91.1
Sprouted frozen	214	424	12.1	1,394	91.0
Sprouted moldy	212	426	12.8	1,389	90.6

Ontario

Precautions When Buying Damaged Wheat

High moisture wheat should be dried down to acceptable storage level. Wheat that is musty or gives evidence of excessive mold should not be purchased. Most molds are not poisonous to poultry in small amounts. However, a few molds produce poisoning, and it is impossible to see the difference between the good and bad without a laboratory test. The best policy, then, is to avoid moldy wheat and grains of any kind.

Conclusions

The usefulness of wheat in a poultry ration is limited only by an understanding of its nutritional properties and the prevailing economic situation. Generally wheat attains a more favorable relationship with corn as cost of major protein sources (i.e., soybean meal) increases.