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### G77-386 Wheat in Poultry Rations

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## Wheat in Poultry Rations

**This publication examines the advantages and disadvantages of wheat as a component of poultry feed.**

*T. W. Sullivan and E. W. Gleaves, Poultry Nutritionist and Extension Poultryman*

Wheat is usually considered a source of human food rather than an ingredient for poultry and livestock feeds. This is especially true in the United States, where corn, milo and other feed grains are abundantly produced. In recent years one of every two bushels of wheat produced in the United States has been exported. If world production and supplies of wheat are high, a surplus develops and wheat prices are lowered. When this situation occurs wheat becomes an attractive alternative to corn or milo in many areas of Nebraska and in other midwestern and western states.

Wheat is quite palatable to poultry. Milo and wheat are comparable in metabolizable energy, but both are slightly lower (5-7%) than corn. The protein content of wheat is higher than corn and may be higher than milo. Protein content varies from 11 to 19%, depending on type of wheat, variety and test weight. The first step in formulating rations with wheat is the determination of protein content and consideration of other nutrient levels. Corn, milo and wheat are compared as to composition in the tables.

Wheat can be the primary ingredient (80-85%) in poultry rations along with soybean meal, supplemental vitamins, minerals and amino acids. According to the publication "Wheat As a Feed for Poultry," (C. W. Carlson and B. J. Bonzer, Cooperative Extension Service, USDA, and South Dakota State University, Brookings, S.D., No. FS 512), a layer diet composed largely of wheat would need a supplement of about 0.04% threonine, 0.06% methionine, 0.05% lysine and 0.35% leucine. Soybean meal contains about 3.8% leucine, thus a 10% level would be needed to meet the leucine requirement. In so doing, the other amino acid needs would be met, since the 10% soybean meal would also supply 0.06% methionine as well as 0.19% threonine and 0.3% lysine. Additional methionine would most likely further improve layer performance, especially when feed consumption was low.

<b>Average Metabolizable Energy, Protein, Amino Acid and Linoleic Acid Composition of Corn, Milo and Wheat</b>							
<b>Grain</b>	<b>M. Energy</b>	<b>Protein</b>	<b>Lysine</b>	<b>Methionine</b>	<b>Cystine</b>	<b>Tryptophan</b>	<b>Arginine</b>
	kcal/lb	%	%	%	%	%	%
Corn	1550	8.2	.24	.18	.16	.07	.40
Milo	1480	9.0	.22	.12	.14	.07	.30
Wheat <sup>a</sup>	1450	12.5	.34	.24	.26	.15	.70

<b>Grain</b>	<b>Histidine</b>	<b>Isoleucine</b>	<b>Leucine</b>	<b>Phenyl- alanine</b>	<b>Threonine</b>	<b>Valine</b>	<b>Linoleic acid</b>
	%	%	%	%	%	%	%
Corn	.17	.43	1.10	.43	.34	.43	1.77
Milo	.27	.53	1.40	.45	.27	.53	1.11
Wheat <sup>a</sup>	.27	.54	.90	.63	.36	.54	.82

<sup>a</sup>Composition data for wheat are based primarily on hard red winter wheat. Average protein content of hard red winter wheat is 12.5%; wheats may vary in protein content from 11-19%.

## **Additional Considerations and Suggestions on the Use of Wheat in Poultry Rations**

### *Physical Form*

The physical form in which wheat is fed can be important, since finely ground wheat becomes very sticky when wet. Rations containing high levels of finely ground wheat will stick to the beak of birds and may cause beak impaction, reducing or impairing feed intake. Finely ground wheat should be limited to 5 or 10% in poultry rations, especially rations for young chicks and poults. If wheat is coarsely ground, rolled or fed as whole grain, it may replace from one-half to all the corn in chick, pullet, layer and turkey rations. Rations containing high levels of finely ground wheat may also be pelleted to avoid "stickiness" and beak impaction.

### *Pigmentation*

Wheat does not contain the pigments (hydroxy carotenoids) responsible for yellow color in the skin, shanks and egg yolk of chickens. If a certain level of pigmentation is desired, it must be supplied by dehydrated alfalfa, corn gluten meal, etc. in poultry rations when wheat replaces yellow corn.

### *Substitution of Wheat for Yellow Corn*

Metabolizable energy, protein, amino acid and pigmentation levels in poultry rations will be maintained nearly constant if wheat replaces yellow corn in the following manner: (1) use 10% wheat to replace 9% yellow corn and 1% soybean meal; (2) when yellow pigmentation is desired use 9.5% wheat and 0.5% dehydrated alfalfa to replace 9% yellow corn and 1% soybean meal.

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