WHEAT AS A FOOD FOR GROWING AND FATTENING ANIMALS.

During the past year there have been numerous inquiries in regard to the chemical composition of wheat as compared with corn and oats, its relative value as a food for growing and fattening animals, and the method of feeding which would produce the best results. These inquiries have, doubtless, been suggested by the great change in the comparative prices of the grains just mentioned. In the past we have been accustomed to see a bushel of wheat sell for two or three times as much as a bushel of corn. Recently we have seen 56 pounds of corn sell for more than could be obtained for 60 pounds of wheat. This readjustment of the prices of grain evidently calls for a reconsideration of the methods for disposing of the cereal crops in order to determine which is most profitable under present conditions.

The purpose of this circular is to give a direct and definite answer to the questions which have been most frequently asked concerning the use of wheat as a food for stock.

Comparative Digestible Values.

The quantity and proportion of the different proximate constituents which are present in a digestible form in 100 pounds of some of the common feeding stuffs is compared in the following table with the German feeding standards.

This table presents the chemical aspect of the subject, and is valuable in the indications and suggestions which may be obtained from it. The information which it contains should, however, be used in connection with our knowledge of the habits of animals and the practical results of feeding. We should not care to assert, for instance, that wheat screenings are in general more valuable as a food for animals than the plump, sound wheat, although the table would indicate this to be the case. We may, however, safely conclude that the screenings and imperfect wheat should be fed and only the best wheat put upon the market.

It is seen that wheat contains practically the same amount of protein per 100 pounds as oats, and that both wheat and oats contain about 30 per cent. more protein than corn. On the other hand, wheat only has about one-half as much fatty matter as corn and oats. In carbohydrates the position of wheat is about halfway between that of corn and oats.

Protein, that is the albuminoid constituents of grain, goes to build up the albuminoid tissues of the animal body of which the muscles are the most prominent part, but it may also be changed into fat. The fat in the animal body comes, therefore, both from the fat and the protein in the food which is eaten. The carbohydrates sustain the heat of the body and must be present in sufficient quantity or the more valuable fat which has already been assimilated will be used for this purpose. Young growing animals require more protein than older ones, and also more than fattening animals, in order to supply material for building up the muscles, tendons, and other albuminoid structures.

*Table showing digestible components in 100 pounds of feeding stuff and the nutrittve ratio; also feeding standards.**

	Protein.	Carbohydrates.	Fat.	Nutritive ratio.
	Pounds.	*Pounds.*	*Pounds.*	
Wheat	9.3	55.8	1.8	1: 6.4
Corn (maize)	7.1	62.7	4.2	1:10.1
Rye	8.3	65.5	1.2	1: 8.3
Oats	9.1	44.7	4.1	1: 5.9
Peas	18.0	56.0	0.9	1: 3.2
Wheat screenings	9.8	51.0	2.2	1: 5.7
Wheat middlings	12.2	47.2	2.9	1: 4.4
Wheat bran	12.6	44.1	2.9	1: 4.0
FEEDING STANDARDS.				
[Per day and per 1,000 pounds, live weight.]				
Horses, moderately worked	1.6	10.0	0.5	1: 7.0
Horses, heavily worked	2.5	12.1	0.7	1: 5.5
Growing cattle:				
Age 2 to 3 months; average live weight, 165 pounds	4.0	13.8	2.0	1: 4.7
Age 6 to 12 months; average live weight, 550 pounds	2.5	13.5	0.6	1: 6.0
Age 18 to 24 months; average live weight, 940 pounds	1.6	12.0	0.3	1: 8.5
Fattening cattle:				
First period	2.5	15.0	0.5	1: 6.5
Second period	3.0	14.8	0.7	1: 5.5
Third period	2.7	14.8	0.6	1: 6.0
Growing pigs:				
Age 2 to 3 months; average live weight, 55 pounds	7.5	30.0		1: 4.0
Age 5 to 6 months; average live weight, 137 pounds	4.3	28.7		1: 5.0
Age 8 to 12 months; average live weight, 275 pounds	2.5	16.2		1: 6.5
Fattening swine:				
First period	5.0	27.5		1: 5.5
Second period	4.0	24.0		1: 6.0
Third period	2.7	17.5		1: 6.5

*The figures in these tables are taken from the article by Prof. W. A. Henry, on "The feeding and management of cattle," in the Special Report of the Bureau of Animal Industry on Diseases of Cattle.

This table brings out in the clearest possible manner, first, the near approach chemically of 26.6 pounds of wheat to the German standard ration for growing cattle from 6 to 12 months of age, and, secondly, the fact that 33⅓ pounds of wheat comes much nearer the feeding standard for fattening cattle than does the same quantity of corn. The proportion of the protein to carbohydrates and to fat is very much nearer the standard in wheat than in corn. Tried by these standards wheat is better both for growing and fattening animals than is corn.

These standards, however, are not to be considered as perfect. Corn comes nearer being an ideal grain for fattening animals in this country than is indicated by the tables. Such animals apparently do not need as much protein as is contained in the standard, and may take with advantage more carbohydrates and fat. Equal parts of wheat and corn should, therefore, prove better for fattening animals than either of these grains alone. For growing animals corn is plainly not so suitable as is wheat or oats.

Equal Conditions Favor Wheat Feed.

When wheat and corn are the same price per bushel, it is preferable to feed wheat and sell corn: First, because wheat weighs 7 per cent. heavier per bushel than corn; secondly, because wheat is weight for weight an equally good grain for fattening animals, and better for growing animals; and thirdly, because there is much less value in fertilizing elements removed from the farm in corn than in wheat.

	Protein.	Carbohydrates.	Fat.	Nutritive ratio.
First Comparison.				
Feeding standard:				
Growing cattle, 6 to 12 months old	2.5	13.5	1.6	1: 6.0
26.6 pounds wheat	2.5	15.0	0.5	1: 6.4
Second Comparison.				
Feeding standard:				
Fattening cattle, second period	3.0	14.8	0.7	1: 5.5
33⅓ pounds wheat	3.1	18.6	0.6	1: 6.4
33⅓ pounds corn	2.4	20.9	1.4	1:10.1

There are certain points to be borne in mind when one is commencing to feed wheat. Our domesticated animals are all very fond of it, but are not ac-