

feeding is settled. The unsuitability of corn as a food for bacon hogs, when given as the principal or sole grain feed throughout the *entire* life of a hog, has been frequently demonstrated. Its deficiency in ash keeps back the natural development of the muscles, reduces the blood and some of the internal organs of the body, and causes weakness in the bones.

UNSUITABLE AND DOUBTFUL FOODS.—Among other grains which the feeder would do well either to let severely alone or use only in very small quantities until their worth for feeding has been thoroughly tested are beans, buckwheat, and rye. The first-named have been blamed as the cause of the considerable quantity of soft bacon that has passed through the packers' hands this last summer, and which gave Canadian bacon a temporary bad name in the Old Country markets. This may have been so, as a great many feeders in Western Ontario utilized their surplus bean crops in feeding their hogs. It must be borne in mind, in comparing results obtained from feeding bean meal in Great Britain, that their beans are of a different kind from those grown in most parts of Canada. As regards buckwheat, Prof. Robertson has shown by his experiments at Ottawa that buckwheat cannot always be the cause of soft bacon, even when fed alone, while, as regards increase of live weight, it is but slightly inferior to wheat, but it must be remembered that it is heating in character, therefore it is not advisable to use it to any great extent, and then only in conjunction with other and less heating grains. Rye, owing to the fact that so small an acreage of it is now grown in this country in comparison with other grains, has not entered largely into the feeding of hogs, but both rye-shorts and rye bran have been tested in Denmark, with the result that their use in any considerable quantity has been found prejudicial to obtaining the best quality of bacon. Rye itself, as regards the gain made in weight, has been shown by Danish experimenters to be equal in feeding value to barley, while, as regards its influence on the quality of bacon, Danish experiments also seem to be favorable. In view of the bad results obtained from its by-products, however, it would be well to refrain from feeding it too lavishly until our experiment stations have made further tests of its practical value.

There are other foods which, while their use in reasonable quantities is oftentimes beneficial to the health and well-doing of feeding hogs, are yet quite detrimental to the production of good, firm bacon when pigs in the final fattening stage have to depend on them too much for their sustenance and growth, such as rape, grass, and clover. As we have seen above, Prof. Day used rape in connection with meal as part of the ration fed to hogs

in the final stage, not only without bad results, but, apparently, to good advantage. It must not be forgotten, however, that the hogs had been "well grounded," so to speak, as the result of their preliminary feeding, and also that the grain portion of the ration was two-thirds of the whole. Some feeders make the serious mistake of feeding their pigs too "sloppy" a food, that is to say, too much water or swill is added to the grain. The Danes and Germans long ago found out the unsatisfactory results from thus doing, and therefore lay great stress on having the food just moist enough as to run easily into the trough.

Such in brief are the principal foods which our present experience has shown are either unsuitable to use or must be fed very sparingly until their worth for feeding purposes has been clearly demonstrated. It is quite possible that further tests may show them, under certain conditions, to be possessed of greater value for the production of bacon than has been hitherto ascribed to them.

WHAT TO FEED.—Prominent among grains serviceable in the final development of bacon hogs comes barley, which in Great Britain and Denmark is valued above all other kinds of grain for that purpose, the bacon resulting therefrom being very sweet in quality and ranking high in standard. It is possible that our barley, owing to the shorter time it takes in maturing its growth, may not have all the valuable properties of the Old Country barley, but nevertheless it has quite proved its suitability as a food for bacon hogs both when fed alone and in conjunction with other grains, such as peas, wheat, oats, corn and shorts. It has been shown, however, by Prof. Henry, of the Wisconsin Station, and others, that it is more economical to feed barley in combination with other grains than singly, the pigs tested preferring the combined ration to one of barley alone. In comparison with corn meal, eight per cent. more barley-meal was required at the Wisconsin Station to produce a given gain. The barley-fed pigs also drank about twice as much water as the corn-fed ones. In one trial it took 471 pounds of barley-meal to produce 100 pounds of gain. Danish experiments show that pigs fed barley throughout made a daily average gain of 1.10 pounds; those fed on corn throughout gained 1.14 pounds per day. When barley was substituted for corn, when the pigs reached 140 pounds in weight the gain was also 1.14 pounds per day, but when barley was fed at the 120 and 160 pounds limit the daily gains were only 1.09 and 1.10 pounds respectively. As in previous experiments, the carcasses of the corn-fed pigs were rated as poor in quality, and while 92 per cent. of those fed on barley alone came into classes 1 and 2, only 62 per cent of those fed corn throughout were qualified for those two classes, and 14 per cent.

came in class 4, which were sold at a discount.

WHEAT AND ITS BY-PRODUCTS.—Wheat has a high feeding value practically equal to corn, as regards the amount of gain in live weight, and the quality of meat produced is also good. It is only, however, during an era of low prices for that grain that it can be economically and profitably used for feeding purposes, but goose wheat, and frozen wheat, such as is sometimes obtainable in Manitoba, have been and can be put to good service in feeding swine. The pork produced from frozen wheat at the Ottawa Experimental Farm was rated higher than that made off peas; 15.46 pounds of increase in live weight were obtained there from one bushel of frozen wheat. It was thought at one time that wheat might be the cause of soft bacon, but Prof. Robertson has proved that such is not the case.

Of the by-products of wheat, the value of shorts or middlings as a food for both young and older pigs, is well known. Trials at the Missouri Station proved middlings superior to corn in the proportion of 108 to 100. A combination of the two was twenty per cent. more economical than the middlings alone. Like other milling by-products, shorts have a tendency to produce soft pork, and therefore, should never be fed except in combination with peas, barley, corn or other grains. If, however, skim-milk or whey is fed in combination with the ration of which shorts form a part, and, in addition, the hogs can get exercise, the quality and character of the bacon will not be affected. Bacon from pigs fed exclusively on shorts and bran is darkish in color, and as might be expected from the nitrogenous character of this ration, contains a large amount of lean meat. The Kansas Station in some tests found that bacon thus produced possessed a hard toughness when fried, and also shrank more than corn-fed pork when boiled.

Wheat bran has only about half the feeding value of shorts, and owing to its coarse, fibrous nature is not very suitable for very young animals, but can be used for growing pigs, and also to a slight extent, for animals in the fattening stage, its use tending to keep the bowels in good order. The feeding of too much bran results in a depreciation of the quality of the carcass.

PEAS AND OATS.—Peas, on account of the large amount of protein they contain, make an admirable adjunct to other grains in the feeding of swine. They are best fed ground, although they have given good results where they have been fed whole but soaked for some hours previously. On account of their "heavy" character they should not be fed alone but in combination with barley, oats, corn or other grains. When they are fed as the sole grain ration, both the fat and lean of the carcass is apt to be too hard.