

only a very few, not very much weight can be attached to the argument, but this heredity in breeding is something which demands the attention of every stockman, and anything done by the experimental stations or private individuals to clear up the mystery surrounding it, is worthy of special attention.

Manure from Different Classes of Stock.

That the purchase and use of such feeds as wheat, bran and oil cake wonderfully increases the fertility of the land, besides contributing to the thrift of the live stock to which they are fed, is explained by the following figures, quoted from Warrington's "Chemistry of the Farm," as recognized authority on the subject. It is assumed, of course, that the resulting manure is well taken care of, and applied without excessive waste. It should also be understood that some feeds are much more valuable than others. A dollar's worth of wheat bran contains much more plant food than a dollar's worth of corn meal. It will be noted from the table that there is a great difference in the percentage of both nitrogen and ash constituents voided by various classes of animals, work horses and fattening stock returning the bulk of the plant food consumed in their feed, while growing calves fed on milk return only in the neighborhood of two-fifths. Growing stock uses nitrogen and ash to produce muscle, blood and bone, whereas fattening stock use principally the carbonaceous compounds composed of elements taken from the atmosphere through the leaves of plants. A ton of animal fat contains no fertility to speak of. The man who would build up his farm should endeavor to feed his products largely to fattening stock. He who sells bone and muscle sells plant food in large quantities from his farm.

NITROGEN AND ASH CONSTITUENTS IN EXCRETA.

For 100 Consumed as Food :

	Nitrogen	Ash Constituents
Horse at rest	100	100
Horse at work	100	
Fattening oxen	96.1	97.7
Fattening sheep	95.7	96.2
Fattening pigs	85.3	96.0
Milking cows	75.5	89.7
Calf fed on milk	30.7	45.7

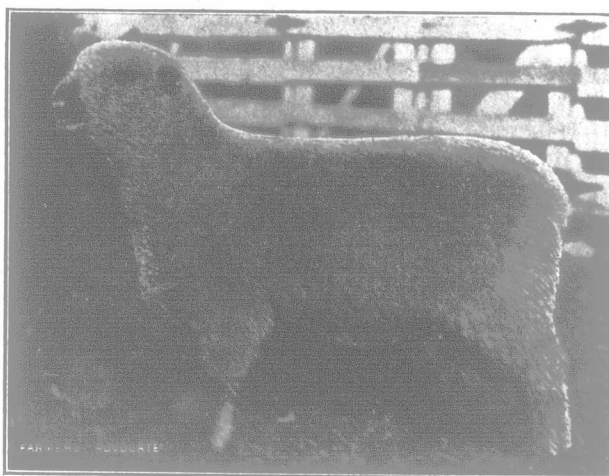
Frosted and Soft Corn.

Untimely severe frosts sometimes damage the corn crop so that its marketable value is considerably lowered, but in this event, as in other cases, the hog comes to the rescue. Soft corn is considered excellent for swine, and especially for the young; in fact, many breeders believe they can obtain better gains from soft corn than from the sound, hard grain. In soft corn, the maturity of the grain has been checked, thereby arresting the development of the starch content or fat-producing element. When used, it is advisable to add, for finishing, some corn that is well matured. Immature corn that is frozen and even somewhat soured may be fed to hogs; but if there is on hand a greater quantity in that condition than can be used on the farm before warm weather sets in, it should be disposed of while the weather is cold. Ordinarily, it may be used in cold

weather without danger, but it should not be carried over into the warm season, as it will ferment and become unfit for use.—[From Coburn's "Swine in America."]

Utilization of Feed by Cattle.

It is a fact of common knowledge that marked differences exist between individual animals as regards the returns which they yield for the feed consumed. A current statement is that a good feeder has a greater digestive power than a poor one, or that the power of assimilation of the one animal is superior to that of the other, and it has been assumed that the advantage of the better type of animal lay in its ability to produce more flesh or fat from a unit of feed than could the poorer one. It has also been commonly taught, and seems to be generally accepted by animal



First-prize Yearling Shropshire Ram.

Central Canada Exhibition, Ottawa, 1911. Exhibited by J. R. Kelsey, Woodville, Ont.

husbandmen as an established fact, that young growing animals not only make actually larger gains than more mature ones, but likewise more economical gains.

The influence of type and age upon the utilization of feed by cattle has, therefore, been investigated by officials of the United States Department of Agriculture, and the result published in Bureau of Animal Industry Bulletin No. 128.

Two steer calves were selected as the subjects of this investigation, one a pure-bred typical beef animal of one of the well-known beef breeds, the other a scrub of mixed breeding. Exhaustive feeding trials were carried out with these animals, including twenty-four experiments with the respiration calorimeter. Finally, the steers were subjected to a slaughter test, whereby the quality of the meat and the relative size of the various cuts were accurately determined. The work is, therefore, important alike to the practical feeder and the agricultural scientist.

The feeding stuffs used were of the same kind for both animals in all the periods, and the different grains used were mixed throughout in the same proportions for each steer. At intervals during the time, the digestibility of the total ration and the nitrogen balance were determined for each animal.

During each of the three winters covered by the investigation, four experiments were made on each animal by means of the respiration calorimeter, in order to determine the percentage availability of the energy of the feed consumed. During the first winter, that of 1904-05, the feeding stuffs used differed from those employed during the ordinary feeding. In the succeeding two winters the grain feeds used were the same, only the amount differing.

While the results fail to show any material difference between the physiological processes of food utilization in the two animals, they do show clearly an economic superiority of the pure-bred over the scrub steer, due, first to his relatively smaller maintenance requirement; and, second, to his ability to consume a larger surplus of feed above the requirement. Both of the facts tend to make the actual production of human food, in the form of meat and fat, per unit of total feed consumed by the animal notably greater by the pure-bred animal.

In the case of the pure-bred animal, especially, and to a less degree in that of the scrub, rations containing less available energy, and notably less digestible protein, than the amounts called for by the current feeding standards for growing cattle, produced entirely satisfactory gains in live weight.

A distinct influence of age upon the maintenance requirement was observed between the ages of 14 and 39 months, the requirements decreasing relatively as the animals matured. The gain in weight of the scrub, as compared with that by the pure-bred steer, consisted more largely of protein, with its accompanying water, and to a smaller extent of fat; and, therefore, represented a materially smaller storage of feed energy. This was also indicated by the results of the block test.

The animals were killed on January 4th, 1908. The scrub was rated as "common," and the pure-bred was graded as "prime." The total dressed weight and the weights of the several wholesale cuts show the considerably higher percentage of dressed weight in the case of the pure-bred, which is characteristic of the beef animal, and likewise the predominance of the loin cut over the less valuable cuts of the forequarter in the beef animal, as compared with the scrub, and the marketable meat of the retail cuts show that the proportion of more valuable cuts was notably greater in the pure-bred.

THE FARM

Fall Plowing.

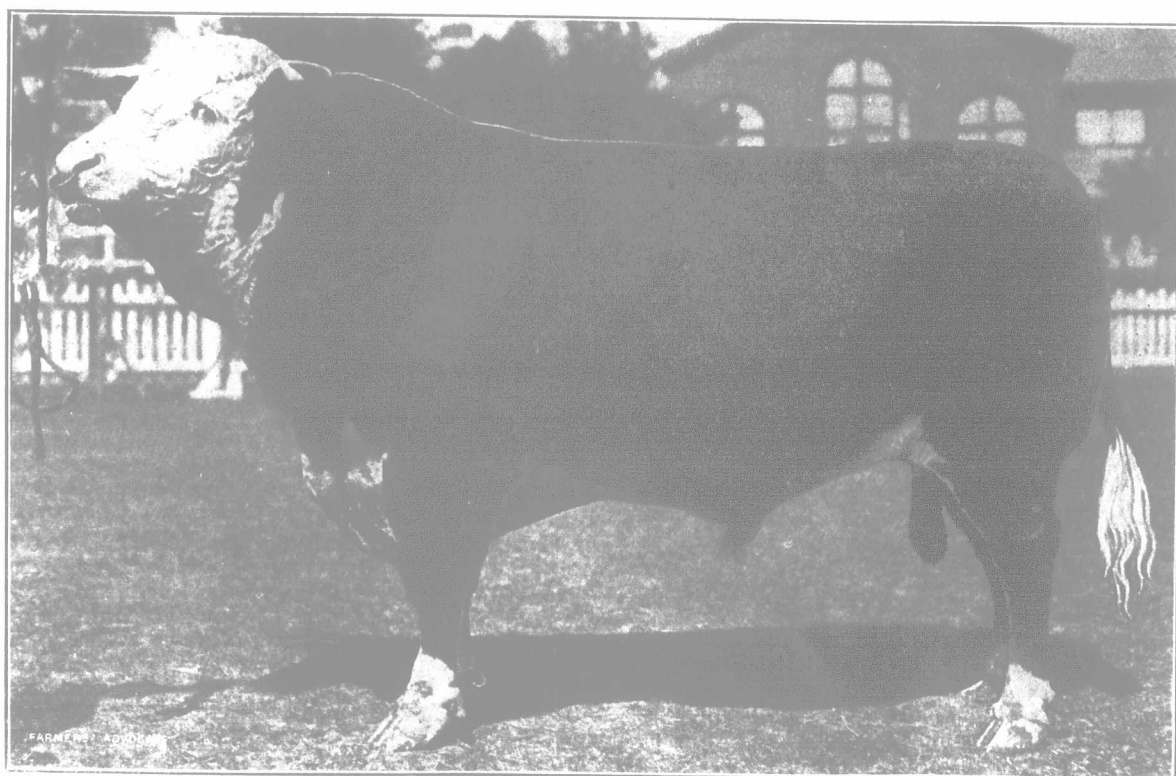
King, in his "Physics of Agriculture," states that the plow, as a tillage tool, is used for two distinct purposes, first to alter the texture forming from a comparatively hard soil a deep and mellow layer of earth; and second, to bury beneath the surface weeds and other vegetation or manure, where it may decay rapidly and be converted into available plant food. The points which go to make up these two purposes are many, and each is worthy of special mention. The texture of the soil is altered in many ways. The stirring of the soil pulverizes it. This is not accomplished immediately, but the gradual settling of the plowed soil serves to crumble it, and it is in a good condition to be further pulverized by the surface cultivation.

Plowed soil is also in a very good state to receive the greatest benefit from the action of the frost. Frost is one of the most important agencies in the disintegration of hard, lumpy soil. Its action is also very marked on a heavy clay soil, where, by causing a flocculation of the minute clay particles, it renders the soil less tenacious and sticky, and thus improves its physical condition greatly.

Pulverizing loosens the ground which has become compacted, and allows of a freer and wider spread of the delicate plant roots. No plant can make its best growth unless the fine, fibrous rootlets can penetrate the soil and extract from it the plant food. And the pulverized soil presents a greater surface from which these roots can feed.

With the pulverizing of the soil, it is also aerated. It is a well-known fact that a certain amount of air in the soil is essential to the growth of all the commoner farm crops. The roots must be supplied with air, as well as the stems and leaves. The beneficial bacteria in the soil, which, by a process known as nitrification, act upon the organic matter in the soil, and change it from an insoluble form to soluble nitrates directly available to the plant, cannot live in the absence of oxygen. The gases of the air also exert a chemical action on the mineral matter in the soil, by which it is converted into a soluble plant food. Aeration is, therefore, one of the main advantages of plowing, and, to insure thoroughness in this respect, an occasional deep plowing is advisable, because thorough aeration is not possible where shallow cultivation is practiced continuously.

The retention of the soil moisture is perhaps one of the most important advantages of this



Refiner —10566—.

Champion Hereford bull, Toronto and London, 1911. Exhibited by L. O. Clifford, Oshawa, Ont.