

large quantities of straw, corn-stalks, over-ripe and damaged hay, or other carbonaceous food; at the same time they must not be deprived of a due amount of nitrogenous or muscle-and-milk-producing food. There is such a thing as an excess of this, but it is seldom fed in excess, save sometimes in the form of grain, though instances have been reported of disease and even death produced by feeding food too rich in nitrogen. This is the most expensive kind of food, and this explains why cows and other cattle so frequently suffer from need of it, while at the same time they are gorged to almost splitting from over-eating carbonaceous foods, in the vain attempt to satisfy the craving of the system for nitrogen. This carbonaceous food is comparatively cheap, and hence is often wantonly allowed to go to waste by feeding it in excess; whereas, did the owner understand the science of balancing foods, so as to avoid waste and still furnish the animal system with all the required elements of nutrition, he would save all his carbonaceous foods, and supplement them with an appropriate amount of the albuminoids. In this way, a waste of both kinds of food would be avoided, and a much larger amount of stock could be kept.

My advice to dairymen and feeders of stock generally is, to feed moderately of carbonaceous food while the weather is mild; to increase the quantity when it is colder, and prolong feeding it all through the winter and spring, as well as fall season. Stock will do better fed in this way, the same amount of food will go farther, and neither common sense nor the rules of true economy will be violated. The poorer the fodder, the more grain should be fed, and *vice versa*, with due regard to the character of both the fodder and the grain fed.

Stock Feeding.

The season of the year is again at hand when we have to turn our attention to the stall feeding of our stock. It is true that in some sections the feeding, or fattening, of steers is not so extensively done as in past seasons, and that the business has not been so remunerative as in some previous seasons; but this should inspire us to be more observing, economic and careful now, so that by reducing the cost of production we may again have a fair profit, notwithstanding a reduction in prices.

But, even apart from this industry, the feeding of stock or even cattle is by no means of small consequence, for the reduction in the number of fattening steers leaves so much more room for the increase of dairy stock, and with these, judicious winter management is of no secondary importance.

A good cow is a very profitable animal if judiciously and economically fed, but it is folly to expect that scrimping her food during her resting period will not seriously affect her flow of milk later on, and that, therefore, the food withheld is gained and economy is practised. As true economy consists in obtaining the largest returns for an investment, it is evident that in this case, where the loss of milk will be materially greater than the saving of the food, not economy but waste has been practised. This waste, not being noticed at the time it occurs, is, however, too often allowed to take place by some farmers. And it is not the only waste in the feeding of stock, for many others may be cited occurring from either carelessness or want of better knowledge. Among these, which must almost invari-

ably be attributed to the former cause, is the actual wasting of the feeding stuffs in the passages and stalls; but as every farmer with enough "spunk" in him to be worthy of the title farmer, should most carefully guard against any such loss without even having his attention drawn to it, we will pass this branch without further notice and proceed to discuss those which are not so easily noticed by the feeder. Among these are the feeding of the grain separately, that is, feeding it without previously mixing it with some coarse substance; compelling them (the stock) to drink ice-cold water; allowing them to drink much water at a time, especially shortly before or after feeding; keeping the stable too warm, too cold, or badly ventilated; not using the stock gently; not attending to them regularly; giving them too much sloppy or boiled foods; not feeding the different constituents of the food in the proper relation, &c., &c. Leaving the others to be treated of more fully on some future occasion, we shall only touch upon the last one we mentioned in our list.

As most of our readers will know, hay or any other food is composed of a large number of compounds, but for our purpose we only need to consider the three most important groups of compounds, viz., albuminoids or crude protein, carbohydrates or nitrogen, free extracts, and fats. Of these the albuminoids are the most valuable, as they, besides being able to form the fat in animals, are the only substance capable of producing flesh and replacing the muscles, which are wasted more or less in a working animal. The fat ranks next in importance, and may for our purposes be considered to be a more concentrated form of the carbo-hydrates, as both these substances are utilized in the production of animal heat and the deposit of fatty tissue in the animal system. The fat produces, however, 2½ times the amount of animal heat, and deposits by far the greater portion of animal fats; in fact, until lately it was believed that the carbohydrates could not be transformed into fat in the animal system. A small percentage of fat is also very beneficial in aiding the digestion of the albuminoids, but too much fat materially retards or prevents the digestion of that substance. The albuminoids and carbo-hydrates have also to be fed in relative proportions to avoid loss. In the different purposes for which the animals are fed this relation differs: thus, in cows giving milk, the best relation has been found to be 2.5 of albumen, 12.5 carbo-hydrates and 0.4 of fat; while in growing cattle (nearly full grown) the best relation is 1.6 of albumen, 12.0 of carbo-hydrates and 0.3 of fat. A slight deviation from these figures may frequently be advisable, to allow for differently-constituted animals and for the difference in their surroundings. But large deviations are sure to result in a loss of the constituent, fed in excess—although the feeder may be entirely unconscious of it, thinking that he is getting all that can possibly be got out of the food—besides frequently interfering with the digestion of the other substances.

In our December number of last year we published a table giving an analysis of various fodders, and all the information necessary to figure out properly balanced ration; but if a sufficient number of our readers wish to have the tables republished, with the same or fuller information on how to use them, we shall be glad to do so.

The stock on the farm should always be tame. It is not a favorable indication to have them fear their owner.

Breeding and Feeding Pigs.

BY J. Y. ORMSBY, V. S.

(Read before the Dairy Conference, held at Kingston, Ont.)

During the last few years the almost entire failure of the wheat crop throughout Ontario, together with the very low prices obtainable for all kinds of cereals, has forced upon the farmers of this Province the conviction that they can no longer depend on grain-growing as a means of livelihood, far less as a source of profit, and as a result we hear asked on all sides of us the question, "What branch of farming pays best?" and in a great number of cases we find the answer given, "Dairying."

Experience has shown us that we have, if not throughout all this Province, at least in the greater part of it, a country admirably adapted to this very important industry; and with a ready market in the old country for all the first-class dairy products we can manufacture, it is safe to say that before many years dairy farming will be, if not the leading, at any rate one of the most important, branches of our agricultural industries.

The agitation that has been going on of late years in the press with regard to matters strictly pertaining to the dairy, such as the better feeding and care of milch cows, and the production of a better article of both butter and cheese, will have a most beneficial effect, there is no doubt, and our only hope is that the efforts of those who are engaged in this good work may be crowned with success. In dairying, as in all other industries, in these days of keen competition, it is very necessary that most careful attention be paid not only to the principal, but also to all the minor branches of our business. Granted, then, that the principal object of the dairyman is to produce an article of butter that will command the highest price on the market, at the least cost, we find that one very important point with him is: how to dispose of what are generally spoken of as the waste products of his dairy; in other words, the skim-milk and buttermilk. That these can be used to the best advantage in the production of good sweet dairy-fed pork, has, I think, been clearly demonstrated by our best writers on the subject, and, consequently, the object of this paper is not to prove this, but rather, taking this as a conceded fact, to point out how we can produce the best and sweetest pork and bacon with the aid of two such important feeding stuffs as skim-milk and buttermilk.

To be a successful pig-breeder one of the most important points is: To have a distinct understanding as to what type of pig you want to produce, before you set about your work; keep that type, or model, in your eye and then by a careful system of selection and coupling, endeavor to produce an animal as nearly like your model as possible; and here it is we find the majority of our farmers at fault; too much of their breeding is done at hap-hazard, on a happy-go-lucky sort of system; one man uses an inferior boar because he gets his services for fifty cents; another does the same, not for this reason, perhaps, but because the boar in question is owned by his next neighbor, and it is too much trouble to take his sows away two or three miles to a pure-bred pig; while a third, unlike the other two, takes his sows to a pure-bred boar, and does not, perhaps, grudge the few cents extra it costs him;