

scraps or tankage. As a general thing, however, he will find most available the highly-concentrated advertised goods everywhere—the gluten feeds and meals, cottonseed meal and several others equally well known. And these, when figured on the basis of variety and cost per pound of protein will meet his needs. Purchased in this manner the selection will be made intelligently and should give in return an increased production of milk, butter or growth, and also greater fertility to the land, because of the manure now rich in nitrogen that will come from the organized protein.

Johnson Co., Ill.

W. H. UNDERWOOD.

Feeding the Crop to Best Advantage

With a full silo, root cellar, grain bin and hay mow, the feeder should sit down and consider how he can best compound the different products in order to manufacture them into the most possible flesh on the animals that fill the runs or stalls. There is nothing nicer about the farm, from a stockman's viewpoint, than commencing with a good herd and a well-filled barn, and seeing his charges thrive and put on gains economically. A good doer is the pride of the feeder, but to make profits one must handle his feeding stuffs very intelligently or the finished bullock will leave his caretaker with nothing but pride. Remuneration leaves a more lasting pleasure, and it only comes where the feeder, to speak loosely, is "onto his job."

With dairy cattle it is quite easy to estimate approximately the amount of fodder necessary for each animal for the food consumed bears a rough relation to the quantity of milk given, but with growing stock or feeders the individual, its manner of feeding and the way it handles and uses the food consumed must act as the indicator. The excuse for writing this article, however, lies not in a desire to regulate quantity so much as to emphasize quality and economical mixing. To make the point more clear a table of common feeding stuffs and their constituents is given.

Common Feeds and What They Contain.

Name of feed.	Total dry matter in 100 pounds	Digestible Nutrients in 100 lbs.		
		Crude protein	Carbohydrates	Fat
	lbs.	lbs.	lbs.	lbs.
Oats	89.6	8.8	49.2	4.3
Wheat	89.5	8.8	67.5	1.5
Barley	89.2	8.4	65.3	1.6
Corn (dent)	89.4	7.8	66.8	4.3
Turnips	11.4	1.0	8.1	0.2
Mangels	9.1	1.0	5.5	0.2
Fodder corn	57.8	2.5	34.6	1.2
Silage	26.4	1.4	14.2	0.7
Wheat bran	88.1	11.9	42.0	2.5
Linseed meal (old process)	90.2	30.2	32.0	6.9
Cottonseed meal	93.0	37.6	21.4	9.6
Clover hay	84.7	7.1	37.8	1.8
Mixed hay	87.1	5.8	41.8	1.3

Out of thirteen different feeds named in this table ten are usually produced on the farm, and from these ten a good ration indeed may be compounded. The two outstanding features are the difference in protein content and the variation in dry matter contained in the different products. Cottonseed meal contains approximately 35 per cent. more protein than fodder corn, and the enormous difference in the quantity of moisture carried by the various feeds is quite marked. A full understanding of the significance of these peculiarities in feeding stuffs is absolutely necessary in good herdsmanship.

Variety, succulence, regularity in feeding and balancing the different constituents are the four roads leading to the one center or pivotal point called good feeding. Variety comes, of course, from mixing a number of different grains and products into the one compound; succulence is contained in such foods as roots and silage, while a balanced ration is composed of proteins, carbohydrates and fats mixed in such proportions that while the system is deriving the required amount of protein from the food consumed no excessive carbohydrates and fats are overloading the digestive apparatus or being thrown off with loss to the feeder.

Carbohydrates is a term given to include starches, sugars, etc., and, compared with the fat in foods, the latter is 2.25 times more efficient. Consequently in calculating a ration the quantity of fat is multiplied by 2.25 added to the quantity of carbohydrates and compared with the protein. For instance: oats contain 4.3 per cent. of fat, or in 100 pounds of oats there are 4.3 pounds of fat; this multiplied by 2.25 and added to the carbohydrates equals 58.8. Thus:

$$4.3 \times 2.25 = 9.675$$

Oats have a protein content percentage of 8.8, and, compared with the carbohydrates and fats, the latter exceed by 6.6 times; for this reason oats may be said to have a nutritive ratio of 1 to

6.6. This is a fairly well-balanced ration for growing stock, but for fattening animals it should have more carbohydrates in proportion to the protein. One part of protein to 7 or 8 parts of carbohydrates is a more economical ration for the finishing stall, and some feeders would go even stronger on the carbohydrates. This proximity to a balanced ration is one characteristic that renders oats so acceptable to all kinds of stock, and feeders should strive towards a balance of this kind when dispensing the food products, via the manger.

Space will not permit of a complete explanation of how a balanced ration should be calculated, but an abbreviated plan may be given. For an example, we will say a ration is composed of ten pounds of clover hay, twenty-five pounds of silage, and twenty-five pounds of roots. Glancing at the table one can learn the constituents in 100 pounds of each of these products, and in the ration there will be one-tenth as much protein, carbohydrates and fats in the



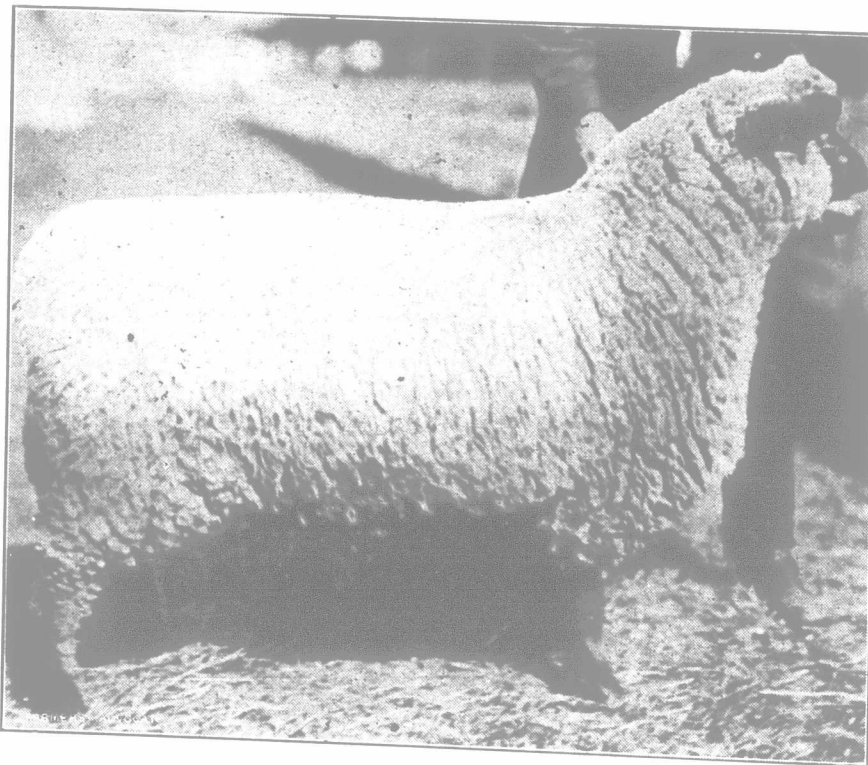
Champion Duroc Jersey Sow at Toronto, 1914.

Owned by Mac Campbell & Son, Northwood, Ont.

clover hay as occurs in 100 pounds as mentioned in the table; likewise there will be one-quarter as much of these constituents in the roots and silage. Bearing this in mind the new table of our ration will be as follows:

Kind of feed.	Protein lbs.	Carbohydrates lbs.	Fats lbs.
Oats	0.88	4.92	.43
Turnips	0.25	2.0	.05
Silage	0.35	3.5	.17
Totals	1.48	10.42	.65

In these 60 pounds of hay, roots and silage we find there are .65 pounds of fat, 10.42 pounds of carbohydrates, and 1.48 pounds of protein. In



Oxford Ewe.

First prize and champion at Toronto and London, 1914, for Peter Arkell & Sons, Teeswater, Ont.

order to place the two former ingredients on equal footing, as before explained, we must multiply the .65 pounds of fat by 2.25. This fat we find by multiplication is equal to 1.46 pounds of carbohydrates. The two are then added together, making a total of 11.88 pounds of carbohydrates and fats. This quantity exceeds the 1.48 pounds of protein by approximately eight times, so the proportion of protein to carbohydrates and fats is as 1 is to 8, or the ration has a nutritive ratio of 1 to 8.

It will be apprehended at a glance that the ration herein considered is not a commendable

one, for it only contains 17.87 lbs. of dry matter, the rest being moisture, and it should have some grain associated with it to produce the greatest gains. However, for a young, growing animal the feeds entering into the mixture would make economical gains if it had a little more protein, thus making what is called a narrower ration.

A combination of five or six different food elements would be calculated similarly, and the variety added by the addition of chop, bran or linseed meal would have a beneficial effect. Producing dairy cows require a nutritive ratio of about 1 to 6 or 6.5, and some of the latter mentioned feeding stuffs are often necessary to introduce the required protein. It is this technique of mixing rations, supplying an abundance of succulent feeds and watching and detecting the wants of the individual animals that make herdsmen.

Stop the Calves' Horns.

Thousands of cows will be freshening this fall, and unless the calves are pure-breds to be kept for breeding purposes, dehorning, or rather an application to prevent the growth of horns, should be practiced without fail. This is no new subject to be discussed in these columns, but people seem to forget the material to be used and the time of application. Get a stick of caustic potash from the druggist, simply moisten the ends and rub the scurs on the calves' heads well with this. Be careful not to get the potash too wet, or it will run down the sides of the calves' heads and cause ugly sores. Also in rubbing the scurs care should be taken not to rub around them to such an extent as to burn the skin. The best age to apply this material is while the calf is young, three or four days old preferably, but it will do the trick at any age under three weeks. Older than this it is not so successful, and more than one application may be found necessary. Buyers of feeding cattle prefer animals without horns. Drovers pay a premium for them, and it is a well-known fact that dehorned steers are much more tractable, are easier feeders, and altogether more valuable than those having horns. Dairy cows may also be handled to better advantage without horns.

Let the Inferior Ewes Go.

Right now, just before the ewes are bred, is the time to cull the flock. Good sheepmen who are observant know which are their profitable breeding ewes, and which are their useless boarders. Some likely looking individuals are not good breeders, have only one lamb invariably, and do not provide enough milk to feed this one skinny little youngster. Such ewes should go

to the butcher in the fall. Ewes which are irregular breeders would also be more profitable on the block than in the pen. We would rather keep an old ewe with a defective mouth but one which is a regular breeder, throwing good lambs and giving milk enough to feed them well, than a young vigorous ewe which cannot be depended upon to breed regularly, and which is known by the condition of her offspring to be a poor milker. Unless the ewe flock is depleted in numbers, however, it is not generally advisable to retain a ewe with a badly broken mouth. We have known old ewes to be profitable breeders for several years after their teeth began to go, and where time is available to give them a little care and where the proper feeds are supplied they will do very well. These conditions are usually found where

only a small flock is kept. Where there is a big flock of breeding ewes and where each ewe must rustle for her feed only those with the good mouths should be bred. The time to cull is now, and be sure to trim the taglocks and long wool from the rear of all ewes to be placed with the ram in the breeding flock. It is also well to mark the ram so that he stamps the date of service on each ewe. This is a check alike on his sureness and on the time lambs may be expected.

Give all the stock plenty of bedding. Nothing is more injurious than bare cement.