

vements—have adopted the theory into practice in a whole-sale way, and with apparently good results, but so also have they adopted the escutcheon theory, which we find is oftener wrong than right on this side of the water. Let us repeat that while we believe 1 to 5 albuminoid ratio is admirably suited to Dutch cattle and others of the *Bos urus* type, we hold it necessary to give 1 to 3½ or 4 for breeds where rich milk is usual and expected. Mr. Finch commends the rations which he gives, as they keep the animals in good health, and yielding satisfactorily. Would he see if the analysis of the milk as regards fats and total solids bears out what we say, or the reverse? To look at the practice of the ordinary run of farmers it certainly seems as if they found it necessary to give a larger proportion of albuminoids, for the quality of bran, cake, bean meal, &c., which is generally used, must give a high ratio—bran itself being looked on as a stimulant in this direction. The Vernon experiments carried out in 1886 by the British Dairy Farmers' Association obtained results corroborating the German theory, and it was found that as little as 20½ lb. of dry food daily was sufficient to give maximum results. We presume the breed was Shorthorn, and if so it corroborates what we say above respecting different breeds where the fat percentage is low (averaging about 3½ per cent. in these experiments). But for other breeds, and especially where quality of milk is desirable, we maintain that while the total dry food may remain the same, the proportion of albuminoids must be increased to some extent.

There is, of course, the argument that animals ought to yield proper results on a given standard, and in comparing one animal with another we must adopt a common basis of this nature, while those which do not come up to the mark should be got rid of as inferior, but there are an endless number of circumstances to be taken into account in practice, such as the available supply of food on the farm, the desires and appetites of the individual cow, the breed, the kind of milk desired, the natural capabilities of each animal, &c., &c. Of course we can breed in the direction of the standard of feeding, and perhaps develop a strain of milkers which will give the maximum yield on the quantities laid down—but we question if some other drawback would not arise. At the recent Dairy Show there were some abnormal results in the way of quality obtained from Jerseys and Guernseys. If these animals were fed with food of the quantity and quality stated in the rules, then we hereby acknowledge that we are wholly in the wrong, and that our own experience is misleading.

In conclusion we may just point out that grass—the natural food of the cow when yielding her best milk, and the most of it—has an albuminoid ratio of about 1 to 3½ or 3¾. We grant, of course, that she requires more oil or carbohydrates in the cold weather, but nevertheless, this is a very good argument in favour of an increase in the amount of nitrogenous food.

P. M'C.

Raising Calves by Hand.

MESSRS. EDITORS—Having noticed several articles in the COUNTRY GENTLEMAN discussing the two methods of raising calves—allowing them access to their mother, or raising them by hand—I give our experience with the latter, which we consider far preferable. The many advantages in favor of weaning the calves should entitle it to universal practice, not only in large dairy establishments but also in small families where only one or two cows are kept. With judicious care in feeding, the calf keeps healthy, grows faster, because it can thus be taught earlier to eat other more nutritious foods,

and at milking time both the cow and her calf give the herdsman far less trouble. Instead of being stunted in its growth, the calf raised by hand may be pushed faster than one with its mother, though when intended for the dairy this should not be done.

Weaning the calf also renders the cow much easier to milk, for as her calf is never allowed to perform its office of relieving her udder of its pressure of milk, she soon forgets the calf and adopts the milker instead, pouring out her whole wealth most generously under his skillful manipulation. No reserve is kept back, the cream of the cream, for the absent darling who with calkish playfulness has run off to a distant pasture with the yearlings. Neither is there any uneasiness on the part of their owner, lest the cows and calves should get together between milkings, for as calves that look to their mother for milk depend upon that alone, they consequently go hungry a great part of the day and spend their time waiting at bars and gates ready to slip through at the slightest opportunity. Their mothers, too, quite as anxious, will leave the most tempting pastures long before milking time, and stand lowing at the gate, answering back the plaintive cry of their offspring. As it is now, all that old-time excitement attending each occasion of home coming is done away with, and I do not remember hearing a cow low for six months. They come quietly from the pasture in single file, march into the barn, and each takes her place automatically and waits for the attendant to relieve her of the milk that was beginning to grow burdensome. They have been on good terms ever since her calfhood, and now that she is filling his pail she feels that she is to her milker *in loco matris*.

The calves were housed first; they followed the herdsman as he came up, for he finds that tolling them along by holding out his finger to the youngest is easier work than driving. Each calf has made friends with him very early in life—in fact its first meal was taken from his finger which had been dipped in its mother's milk, the process being repeated until the young animal's head found its way into the shallow milk-pail. During the first three or four weeks of its life the calf remains alone in a close box stall where it has a bed of soft, clean straw, and is fed by the herdsman three quarts of its mother's milk freshly drawn three times a day. This continues as long as it is necessary to milk her that often. When she is milked only twice in 24 hours then the calf is fed twice, receiving each time from one to two quarts more than it formerly received at a single feed. The quantity of milk given should be specially adapted to the requirements of each calf, an unusually large one more, and an undersized one less, the herdsman being the judge in such cases and reducing the quantity at once should it appear to disagree with the calf.

There are many benefits derived from housing the calf until it is three or four weeks old. Its bones are too soft for the rough awkward exercise in which it often indulges, and they are sometimes sprung out of line; in fact one of ours had the misfortune to break its leg, probably in some of its wild frolics. Then they are protected from the rain, the cold, or the hot sunshine. The time spent in looking up each calf at feed time is also saved, and a pleasant social relation is established between the calf and its attendant. This should be one of gentle but firm control on one side, and of quiet submission on the other. The calf should at the beginning have a leather collar buckled around its neck, and should be led about occasionally or tied so as to learn obedience to control.

When about four weeks old, let the little prisoner out of his stall some bright sunny day after its morning meal. The first glimpse of the outside world has a very amusing effect on the little fellow. First it runs here and there at the top of its speed, seemingly in play, but really prompted more