

and ashes will at least double the bulk, and are not near so strong, weight for weight, as sulphate of ammonia and the potash salts, the quantity used should be proportionally increased. We trust that some, at least will be persuaded to apply all fertilizers broadcast, instead of in the hill, even though they use but a small quantity to the acre.

DR HOSKINS in Vermont Watchman.

Home-Bred Cows.

We have no doubt that dairymen find it extremely difficult to buy profitable cows in market, and the more the dairyman knows about cows, the nearer impossible he will find it to buy such cows as he wants. Now, is this not really the turning point in the case? The dairyman must have profitable cows, or he cannot afford to carry on the business. It is generally conceded that he cannot depend upon finding them in market, and as the low average yield of dairies proves the business unprofitable, what reasonable solution can there be but to intelligently breed his own cows? Given good cows, a good dairyman can keep them at a fair profit. If it is proposed that the dairyman shall raise no better cows than he can buy, then he certainly cannot afford to raise them, for they are not worth raising. But we must suppose that he goes into this business of breeding his own cows, just as any prudent man should go into any business—studies all its points, and tries to understand it. He will breed heifers only from his best cows. And to know which are his best cows, he must test each cow separately. This cannot be guessed at. If his herd is kept, uniformly, for quantity of milk, then this test must be sufficient; but if for general dairy purposes, he must test for quantity of butter as well. The cream test has little value, for quantity of cream does not determine quantity of butter. When the dairyman knows the individual merit of his cows, then he is prepared to breed intelligently from them. He will, of course, be as guarded and critical of the merit of the sire as of the dam. If he studies the matter as he should, he will select a pure-bred male of the breed which he thinks best adapted to his style of dairying. The dam and grandam of the sire, at least, should have strong merit in the particular excellence he wishes to breed in his heifers.—*National Live Stock Journal*.

Influence of Food on Milk.

Sir John B. Lawes, in reply to a letter from Mr. Morgan Evans, writes as follows:—

"I do not think that the quantity of water supplied to cows reduces the quality of the milk provided the cows are well fed. My cows, both in-doors and out-of-doors, have as much water as they like to drink, and for the class of cows (Short-Horns) the quality of the milk is high, but they are highly fed preparatory to the regular experiments which I propose to carry out next winter. The food and milk of my dairy cows have been carefully weighed by one of the persons out of my laboratory. The following are the figures per cow daily:—Decorticated cotton-cake, 4 lbs.; bran, 3½ lbs.; hay, straw and chaff, 14 lbs.; mangels, 80 lbs. Average of two or three months, 100 lbs. of food, or, calculated as dry, 27 lbs. Average produce of milk per day, 30 lbs.; number of cows, 25 to 31. There can be no doubt that if the cotton-cake was stopped the milk would reduce both in quantity and quality,

and that when brewers' grains are largely used, a milk containing a large amount of water and a low amount of fat is produced. You are quite right in saying that solids and albuminoids are more constant than the fats. Fat is increased by rich food, but breed is more potent than food, and no amount of food will produce in a Short-Horn as rich a milk as is produced in a Jersey, or in an Ayrshire as is produced in a Highland cow. The same law prevails both in plants and animals. We get several more per cent. of dry matter and sugar in our experimental sugar beet and mangel crops, when the plants resemble in size their native form, but we only get perhaps half a ton of sugar per acre; whereas, by feeding them highly, we obtain two tons of sugar per acre in roots having a higher percentage of water and a lower percentage of sugar. Unless I had made certain of the fact, I could not have believed that mangels so worthless in all feeding properties could have been grown, and, for the same reason, I think you might produce a genuine very poor milk. Genuine or not, I think a standard of quality should be fixed, below which no milk should be sold."

Dr. Augustus Voelcker has also replied to the same leading questions Mr Evans addressed to Sir John Lawes. He says:

"The direct supply of water to milk cows, according to my experience, does not affect the quality of the milk, at least not to a very appreciable extent. You cannot, in other words, water the milk by giving cows much water to drink. The case is different if washy or very succulent food, which is always very watery, often immature, and at the best poor or innutritious, is given to cows. In my judgment it is the poverty of the food, rather than the excess of the water, which causes cows fed upon such food to become watery. Again, if food such as brewers' grains or silage, which is naturally sour, or barley or oatmeal, is mixed with water and kept until the wash gets sour, such acid foods or wash greatly promote the flow of milk, and unless supplemented with concentrated food, have the effect of producing much but watery milk. All the constituents—fat, casein, milk, sugar and ash—vary in cows' milk according to the breed of the cows, age, time elapsed since calving, and especially the quality of the food on which they are fed. The greatest variation occurs in the percentage of butter fat. I have had milk sent to me for analysis which yielded twice, and even three times, as much butter fat as other samples of an unquestionably unskimmed, unadulterated milk. The proportions of solids not fat vary much less. Milk, and to the same extent also, the relative proportions of casein and milk sugar, vary in different samples of milk, but not in any great degree. As a rule, a milk which yields a high percentage of solids not fat, also yields much fat. I have never found as little as 2.2 or 2.4 only of fat in a milk containing 9.2 per cent. of solids not fat. If milk gives 8.7 of solids not fat, and only 2.4 per cent. of fat, in my opinion it is skimmed, but may be otherwise pure and not watered.

"As a matter of fact, the bulk of London milk has more or less of the cream taken off, especially in the strawberry season; and in my opinion the minimum standard of public analysis, namely, 2½ per cent. of fat and 8½ solids not fat, might with propriety and with benefit be altered to 3 per cent. of fat and 8 per cent. of solids not fat. According to my large experience, genuine milk of fair quality, and by no means extra rich quality, such as is produced from well-fed Alderneys, seldom contains less than 3 per cent., and much more generally 3½ to 3¾ per cent. of fat throughout the greater part of the year. My opinion is that a large proportion of milk sold in London and elsewhere, and passing the public analysts ordeal, is more or less skimmed."