

in the value of the produce of these various herds of fifty cows each. As a matter of fact, the milk from the fifty cows giving, say, 900 gals., and being fed at a cost of £1,105 per annum, may be expected to be of better quality than the milk obtained from the fifty cows giving 450 gallons each, and being fed at the cost of £780. This would tell, especially if the milk were made into cheese or butter. Roughly speaking, the milk from the one lot of cows would not contain more than 12 per cent. of solids, if so much, whereas the other would probably show 13.5. Now the difference between 12 per cent. and 13.5 is one-eighth, or  $12\frac{1}{2}$  per cent.—an additional profit to the credit of 900 gallon cows of just upon £75. As I have previously said, I do not for one moment intend these figures to be taken literally, but they will, I hope, convey what I wish to be understood, and point the moral of what I wish to impress—namely, if you keep cows, *keep the best you can, and feed them well*. In noting the yield of cows, I recommend weighing the milk, as being more correct and more quickly done than measuring it.

Now we come to the question of food.

I do not mean to say that a cow is like a steam boiler—viz., that the more coals (food) you throw into the furnace (within limits), the better results you obtain; but I do maintain that the food, both in kind and liberal quantity, has much to do with the important items of profit and loss.

The cow should be, to all intents, from the dairy farmer's point of view, a *machine*; and a very sensitive and wonderful machine she is, and perfectly constructed for the work she has to perform—viz., the conversion of food into milk—the raw material from which butter and cheese are manufactured. To work this beautiful machine to its best advantage, is a question of the most vital interest to the owner. What would be said of a man who, requiring a steam-engine, would go out and buy the first he saw, and so long as there was a boiler, furnace, cylinder, piston, cranks, wheels, valves, and certain other appliances and fittings, take not the slightest care to ascertain by whom the machine was made—in fact, how it was bred—and having bought his engine, forthwith proceeds to put it to work, regardless of the description of coal, the sort of oil, or the quality of the water with which he supplied it, or whether it was left out in the fields, exposed to the weather, or housed under some tumble-down old shed, where all its most delicate parts and fittings became clogged with dust and dirt? Well, I expect that man's neighbours would think "it would not last long." This, however, is just what a lot of farmers do with their cows; they heed about as little how they are bred as how they are fed.

Let us begin with water. I do not think that half the attention is paid to the watering of cows that there should be, either as to the regularity of the supply, or the quality. Cows will rather drink foul water that is near them than go to a distance; when tied up they are, of course, totally dependent upon those in whose care they are. Depend upon it that the supply of clean, wholesome water, and in good quality, is of the greatest importance.

Salt, again, is a positive necessity to a cow. If salt be withheld, the quantity of milk will be lessened; and it is a question whether a good supply of salt does not greatly increase the keeping quality of milk. Every animal ought to have access to a large piece of rock-salt. While we are on the subject of water, let me impress upon all dairy farmers the importance of washing and bathing the cows' udders and teats; this ought to be done at least twice a day, before each milking. Attention to this has much to do with the flavour and keeping qualities of milk, butter, and cheese.

Last winter I put together some notes as to the yield of milk on twenty-three farms. The farmers filled up a form on the first of each month, giving the number of cows in milk, the

number calved since the previous return, also the food used, description, and quantity. The quantity of milk was, of course, shown by our books, as each farmer sent all produced, except the requirements for his house. Almost daily analyses of the milk were made—at all events, at least twenty per month—ascertaining the total solids and the "fat." In order to be able to make a fair comparison, we worked out the quantity of milk each farmer would have sent, based upon what he actually did send per cow, if each had had fifty cows in milk. The results are instructive, and fully bear out the previous figures that I have given you.

The money value of the milk of fifty cows (at 8d. at the farm) ranged from £1 10 11 per day to £5; the total solids, from 11.53 to 13.98. I believe the milk showing only 11.53 per cent. of total solids had been slightly watered; at all events, we talked very seriously to the sender, and the quality improved. The "fat" ranged from 2.52 to 3.66. These figures refer to milk received in the depth of winter. Last month, October, the total solids ranged from 14.85 to 12.68—mean 13.18; but some of this was from Jersey cows. Average of fat, 3.31, ranging from 4.19 to 2.99. It is most difficult, however, to arrive at reliable conclusions when you are dealing with milk from so many herds, as the proportion of recently calved cows, or of heifers in the herd, or other circumstances, have to be taken into consideration. I therefore selected six farmers who had over 20 per cent. of newly calved cows per month; and for our present purpose it will suffice to take the lowest and the highest of these six. We will call them 16 and 18, as those numbers represent their position among the twenty-three, as fixed by the quality of the milk—No. 16 having 12.42 total solids, and No. 18 12.40; so that virtually the milk was identical in quality. No. 16 had the advantage in "fat"—2.88 against 2.71.

The difference, however, to the pockets of these two farmers must have been very considerable; as, supposing each had had the same number of cows (fifty), and the average yield per cow had been at the same rate as that of the cows actually kept, the one farmer would have received £1 17 6 per diem, the other £5, or £562 10 for the year, against £1,500. The former was then using 1 peck of wheat and bean meal, mixed, about 1 lb of linseed cake, half a bushel of roots, and about one truss of hay to two cows; the other was using  $5\frac{1}{2}$  lbs of decorticated cotton cake per cow, and two trusses of hay to three cows. Now the food bill in the case of the former would be heavier than with the latter.

I believe decorticated cotton cake in conjunction with maize meal—in equal proportions—is, without exception, the *food* for milking cows; brewers' grains (ale), if obtainable, say half a bushel a day, roots in season, and good chaff, with a sprinkling of some meal, bean, pea, oat, wheat or barley, and bran, in change, being given, with the cotton cake and maize. The latter together, in equal proportions, form, chemically, a perfect food, as the one is strong in the component parts in which the other is wanting.

Advocating, as I have done for years, dairy farming on arable land, I am sure that not anything like the attention is given to the growth of forage plants that the subject deserves. In my former paper I referred to Prickly Comfrey, then introduced by Mr. Christy. This is a most valuable plant. Then again, on warm suitable soils, I am sure some of the varieties of maize would yield a great bulk of admirable food for soiling. Major Dashwood told me, the other day, that a small patch grown by him had equalled, I think he said, thirty-two tons per acre. I do hope some one will give ensilage a trial. I hear wonderful accounts of it from the United States; and I recently read in an American paper that "if the experiments are successful, and 'silos,' as the storage pits are called, come into common use, the capacity of the farms will be nearly