

frozen hard frequently, as I have often experienced out shooting, when, after a hard day, I have tried to bite one, and have been obliged to carry it in my bosom to thaw before I could succeed. The 14 lbs of water, then, must be raised from nearly freezing point, 32° F., to the temperature of the sheep's body, about 96° F., and this rise in temperature, of at least 64°, must be accomplished by means of the food he eats. It will take 1142 grains of carbohydrates, *burnt* in the animal's body, to effect this, equal to about 6 0/10 of the total food consumed. This is not all, for the waste of food will be augmented by the amount of water lost in sweat, and the combustion of 1426 grains of carbohydrates is required to vaporise, as sweat, 1 lb. of water at the temperature of the animal's body.

Again, the more water drunk, the greater amount of albuminoids oxidised in the body, and excreted by the kidneys as urea: consequently, a loss of nitrogen is incurred by any superfluous imbibition of water. We see then, that the practice of supplying animals eating cold roots with a proportion of dry food, by which the consumption of water is diminished, is confirmed by theory.

Observe that: A horse digests the nitrogenous constituents of hay nearly as well as a sheep, but falls short in digesting the non-nitrogenous parts: that the value of bulky food, like hay or straw, is far greater when given to ruminants, than when given to horses or pigs: concentrated, easily digested foods, have a value far above their apparent composition when added to a poor bulky food, like chaff or turnips, because they raise the diet to a point at which the animal can thrive: again, roots, tares, green-meats in general, may have a useful effect when given moderately in addition to dry food.

Next month, I shall enter upon the subject of the general feeding of animals on the farm, beginning with the calf and the lamb.

ARTHUR R. JENNER FUST.

MR. ED. A. BARNARD.

Dear Sir,—In answer to your question relating to what I said at St. Hyacinthe in regard to skimmed cheese, I beg to reply, that I did say that there was a time when full skimmed cheese, sold for more than the best full cream. My authority for this statement is found in the report of the New York State Agricultural Society, for 1865, page 249.

It is in a paper by the late honourable X. A. Willard, and contains a very full and interesting account of the whole Orange County system of dairying.

I do not wish it to be understood that this is the case at present, for it has been learned that a cheese thus closely skimmed will not keep as long as one with more fat; but it is also a fact that one partly skimmed will keep better in any climate than one made from all new milk, and I did say that partly skimmed cheese, properly made, sold ahead of full cream cheese that was faulty in making, and for as much as the best. Yours truly,

J. M. JOCELYN.

St. Denis, (en bas) P. Q. 19th Dec. 1883.

EDITOR OF JOURNAL OF AGRICULTURE.

Dear Sir,—Owing to what I believe to be a want felt by a large number of farmers of this province, I herewith send you a description of an apparatus, of my own invention, for the manufacture of cheese on the farm.

To begin with, I do not mean to recommend the farmers, who live near a properly situated and well conducted cheese-factory, to withdraw or withhold their patronage from the same, but I would advise them to do all they can to sustain

and encourage it; but to those farmers who do not have this advantage, I beg to present, through the Journal, some facts and suggestions, which, if acted upon, will very much increase their income without adding much to the expense of the farm.

The home consumption of cheese is increasing each year, and the farmers who are situated to make cheese at home, will find a local market for a large amount; and it would give them much more profit to make cheese *and* butter, than to make butter alone. (There are several farmers in the vicinity of Montreal who make cheese, and find a ready market for the same). I say butter *and* cheese, because the ordinary farmer cannot take all the butter out of the milk, neither is it possible to work it all into the cheese.

With the means at the disposal of the average farmer, it is difficult to obtain 4 pounds of good butter from each hundred pounds of milk, on an average, through the season; and, consequently, there remains about one pound in the butter-milk which is fed to the stock at a great loss.

Again, by letting the milk stand in order to get all the cream possible, it generally stands too long, and the quality of the butter is very much injured thereby; whereas, if there are both butter and cheese made from the same milk, it must be skimmed before it stands too long, in order to have the milk suitable for cheese, and thus the butter would be very much improved, and would consequently bring a much better price.

In fact, there is no reason why the butter should not be equal to the best creamery make.

The markets of the world are, and for the past ten years have been, glutted with inferior butter, while fine butter is and has been in good demand at fair prices; hence it would be wise to make less in quantity, of a better quality, and make cheese of the rest.

In old times, butter was bought up indiscriminately, good, bad, and indifferent, all at the same price, but "the world moves," and today butter ranges in price, in all the principal markets of the world, according to quality.

In New York for instance from 15cts to 40cts, and it is not to be supposed that in future there will be any greater demand for second quality butter than at present.

While very fair butter can be made at the rate of 4 lbs for 100 lbs of milk, with careful attention to all the details, with the same amount of care, much finer butter may be made where only half the cream is taken, because the largest and best of the fat globules rise to the surface first, and these make butter much superior to the smaller ones.

Again, the smaller globules of fat work very readily into the cheese, while it is the largest and best that separate and run off in the whey, when all the cream is attempted to be worked in.

Nearly all the cheese made in England is made on the farm, and the famous English Cheddar cheese is made from partly skimmed milk, and it is only the very best American or Canadian cheese that competes with it in the English market.

Now, with the above facts before us, I will proceed to describe the apparatus and mode of using, so that any person of ordinary intelligence if not a practical cheese-maker, can go ahead and make cheese: but, where it is possible, it will be much better if they can go and take a few lessons of a good practical cheese-maker.

The whole apparatus can be got up, large enough for the milk of as many as forty cows, for about thirty dollars, and it is more convenient than any that I have seen costing three or four times that amount; and besides, it may be readily turned into a vessel for cooking the roots for stock or heating water, and also a most convenient place for setting the milk