

little calf there that was very poorly. It was very quiet and so ill, that they thought there was nothing in this world for it but dying. He said to the bailiff, "If you can get another man and manage to hold the calf up, we will see if it is strong enough to suck the cow. If it can manage to suck the cow it may possibly live." He fetched another man or two; they got the poor creature to suck, and after sucking a few minutes it got a little strength. He advised them to let it suck a cow often in the day. They did so, the calf got better, and was sold at the sale to a gentleman named Betts (who had a good deal of money, but who was not a farmer) for 86 guineas, because it was a pure Bates. That calf passed from Mr. Betts into the hands of the Duke of Devonshire, and it was called the Rose of Raby. The whole of that family in the hands of the Duke of Devonshire were bred from that identical miserable-looking calf. Now, he would tell them the prices they realised in September, 1874, and these were considered the best animals sold at that sale. Lot 10 sold for 250 guineas; lot 15, 350 guineas. Another was sold for 150 guineas, and lot 25 was sold for 230 guineas. They would, therefore, observe that from a poor little miserable calf, for which none of the gentlemen present would have given five shillings had they seen it as he saw it, had descended some of the best animals in the possession of the Duke of Devonshire, and which had realised such prices.

(To be Continued.)

BUTTER AND CHEESE.

[Passage from Dr. Sturtevant's pamphlet in London Agricultural Gazette.]

BUTTER made from different cows of the same breed, on similar feed, and giving the same quantity of milk—made at the same time and in the same way—does not necessarily present the same colour, as is shown by the following experiment, made with three Jersey cows:—

	Gaselle.	Desdemona.	Beatrice.
Colour of skin..	Very orange	Middling.	Light color'd
Cream.....	1 lb.	1 lb.	1 lb.
Skim-milk....	7 1/2 lb.	7 1/2 lb.	6 1/2 lb.
Total milk....	8 lb.	8 lb.	7 1/2 lb.
Temperature at which set....	88°	85 1/4°	83°
Average size of globule....	1.6260	1.440	1.5520.
Time in churning.....	30 minutes.	18 minutes.	34 minutes.
Temperature of cream when churned....	66°	66°
Distance of cow from calving..	27 days.	15 days.	40 days.
Butter product.	5 1/2 oz.	5 1/2 oz.	6 1/2 oz.
Colour of butter	Very high coloured.	Good colour.	Light colour
Melting point..	99°	99 1/2°	96°
Character of butter.....	Most Waxy. Good Grain.	Waxy. B st Grain.	Less waxy than others. Poorest grain.

It is, then, not correct to claim depth of colouring as characteristic of the butter of any one breed. I have seen Ayrshire butter of a deeper colour than

*I am indebted to the kindly cooperation and personal assistance of Mr. E. P. Borditch, of Framingham, for this experiment; made with cows selected from his valuable imported and thorough-bred herd.

Jersey butter, and *vice versa*. I am inclined to think, however, that there is a difference in the shades of color in the butter from the different breeds. The Jersey butter is usually, perhaps always, coloured by an orange pigment, which is seemingly characteristic. Owing to this orange tints to the fats, and the character of the substance investing the globule, the Jersey cream oftentimes appears high coloured, especially after standing. This peculiarity of colour to the cream is not confined to the Jersey breed, but seems more usually present or more prominent in this breed than in the others. The colour of the Ayrshire butter is yellow, oftentimes a deep yellow, but appears to lack the particular orange shade already described. The few samples of the Dutch butter I have examined were of a light yellow colour, without trace of orange.

The grain of the butter apparently depends on the state of mixture of the fats in the globule, the waxiness from the greater or less proportion of the solid fats. So far as I have examined, the grain seems to vary according to the size of the globule. In the Jersey butter the grain is well defined; in the Dutch butter, very fine; in the Ayrshire butter, intermediate.

When equal quantities of Jersey and Ayrshire butters were washed in boiling water, and the foreign matter which was removed was allowed to settle, it was found that this nitrogenous matter was not only more abundant in the Jersey butter than in the Ayrshire, but showed a slightly different character, perhaps by calling it more flocculent. Theoretically, we should, therefore, anticipate the difference in the keeping qualities of these butters which we have found in our experiments.

Some pats of Guernsey, Jersey, Ayrshire, and Dutch butters were placed in a warm cupboard, near a steam heater. The Guernsey pat moulded in spots in about a month; in seven weeks the seven Jersey pats were all rancid, one sample having lost its colour in spots, the white spots resembling tallow in appearance; no butter flavor. The two Ayrshire pats had lost flavour, and were poor, but not rancid; one sample in the same cupboard, but on another shelf, retained its butter flavour and taste for three and a half months. From October 15th to January 30, and although not strictly first-class at the last, yet was of fair quality. The Dutch pat not only retained its colour and sweetness, but also its flavor, and this notwithstanding it was unsalted. Perhaps this "keeping power" is the direction of the usefulness of this breed. Holland has for centuries been famous for its shipping butter, and it is possible this keeping quality may be as much in

the nature or endowment of the milk as in the care exercised in manufacture. My experiments with the milk of this cow have, however, been too few in number to allow of my dwelling more particularly upon my results.

Primum facie, the milk most economical for the cheese manufacturer to use is the one which will allow the globules of fat to remain in the cheese, giving it richness and flavour. That the distribution of the globules in the cheese is an important feature can be inferred from the remarks of Dr. Voelker, who not only writes that the price of cheese is usually influenced by the quantity of butter contained therein, but also continues on another page: "The rich appearance of old cheese, however, is by no means attributable entirely to a very large proportion of butter, nor is the poor condition of new or badly made cheese referable solely to a deficiency of butter. One of the chief tests of the skill of the dairymaid is the production of rich tasting and looking, fine-flavoured, mellow cheese from milk not particularly rich in cream. That this can be done is abundantly proved by the practice of good makers."

To the influence of the milk must also be attributed, in part, the discrepancies in the opinions of skilled manufacturers. Some advocate the removal of a portion of cream from the cheese vat, for the purpose of butter-making, and deny much injurious influence thereby on the cheese, whilst others deprecate this course. Its practice is, however, far more common in the late than in the early season, and it will also be remembered that this paper shows a decreased size of the globules as cows are distant from their calving. Mr. Gardner B. Weeks reports sales from his creamery of skim-milk cheese in quantity, at a price within 1 1/2 cent per lb. of the highest quotations for whole milk cheese. All writers unite in testifying to a loss of butter in the whey, and many processes have been invented for its extraction.

These discussions, although of much value, have heretofore left the difference in the milk out of consideration. Quality of milk does something for the maker; skill also does something; both combined bring great success. The mixed milk of numerous cows does not always indicate to chemical appliances the actual or potential value to the dairyman, for he deals not alone with composition, but with structure also in the process of either butter or cheese making.

During the ripening of cheese, a portion of the casein or curd suffers a decomposition, and is partially changed into ammonia; the latter, however, does not escape, but being an alkali combines with fatty acids produced in course of time from the butter. The peculiar mellow appearance of good cheese, though due