

spongy curds, which are likeliest to occur in hot weather, it is clear that a pernicious ferment has obtained possession, and that the cheese will be imperfect not in flavour only, but also in texture.

Many dairymen have passed through much tribulation on account of microscopical microbes, those members of the infinitely little and of the infinitely numerous in vegetable life, which so commonly bring about very considerable results elsewhere, and which indeed are the ferments that promote decomposition in many organic and inorganic bodies. The opinion that many dairymen have miserably failed to make good cheese, and failed through no fault of their own, may be held with confidence in its substantial accuracy. The cause of failure is always attributable to some pernicious ferment or other which has obtained a lodgment in the milk or in the curd, or in the formed cheese in the ripening-room. And so, also, the cause of success is never inseparable from the action of a beneficent ferment which brings about a satisfactory ripening of the cheese. In the dairies of France and Germany, not to mention other countries, where certain kinds of special kinds of soft cheese are made, an old ripening-room, the air of which is impregnated with the special fungoid or vegetable germs that ripen the cheese in the way desired, is considered to be of very considerable monetary value, and was so considered long anterior to the time when the microbic theory was beginning to emerge from the darkness of ages. This applies specifically to soft cheese, no doubt, for hard cheese, once pressed into form, is less open to outside influences. Hard cheese, indeed, may be said to acquire the ferments which eventually ripen it distinctively—acquire them in the milk, or in the curd before it is pressed into form, and once acquired they go on increasing prodigiously in numbers, whilst their activity, under favourable conditions of temperature and moisture, ceases only when their work is done and there is nothing else to decompose.

The value of cleanliness, in conjunction with the employment of scientific cultures of microbes suitable to produce excellent cheese and butter, is now understood in a way that is modern. Cleanliness in dairies—cleanliness even as to the air in them—is required to dispossess pernicious microbes, and to give beneficent ones the predominant power which brings about a given result.

Hence it is that we may infer that want of cleanliness in the dairy and imperfect ventilation with good air, or perfect ventilation with bad air, which is even worse, have been the cause of failure in thousands of dairies. To those who find difficulties still in the ripening of cheese, and there are many who do, we can only say that the question of ferments is at the bottom of all, the mischief, and that the only way to get rid of the difficulty is to get rid of that which causes it. Marked instances have come under our notice, not only as to the presence of pernicious bacteria, but also as to the absence of those that would have been beneficent. The problem is coming nearer to solution—the problem of microbic ferments—and within almost measurable distance of time all dairymen who will take the pains to become instructed, and to put into practice the instruction so obtained, will be able so to control the art of cheese-making or of butter-making that the result will be almost uniformly satisfactory, limited chiefly by the capacity of those by whom the art is practised

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#### DISCUSSION ON THE MANAGEMENT, Etc., OF DAIRY-COWS.

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We borrow the following discussion of a lecture, given by Mr. J. H. Grisdale, Agriculturist of the Dominion Experiment-farms, at the Annual Convention of the Cheese and Butter Association of Eastern Ontario, from the *Nor'-West Farmer*. We hold that, if, as Mr. Grisdale says in his lecture: "The system of rushing every animal for all she is worth is the system that pays, when dairy-produce is the sole object," that system, almost of necessity, demands utter repose during the winter months for the cows, and as much repose for them in the summer as is compatible with the acquisition of a full belly when on pasture. But, as the lecturer sensibly remarks: "If pure-bred stock are kept, of course other considerations enter in with which I may not deal"; by which I suppose Mr. Grisdale means that the taking exercise on the part of the cow tends to improve the condition of the foetus.

We do not turn fattening beasts out for exercise, but keep them in close quarters. They extract protein, fat, etc., from roots, cake, etc., more easily when at perfect rest in small loose-boxes