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the greater the competition among the factories, the larger the returns. This I do not think will bear out in the majority of cases. The expense of keeping up factories should, if properly done, be as great for the small factory as for the large one; and the cost of making, if properly done, must be greater, while the product is very often of such an inferior quality that much less price must be taken, or else the price of all the cheese made everywhere must be lowered, in order to make up for the losses sustained by the buyers of inferior cheese. Patrons will say that the expense of drawing milk long distances is too This, I know, is one of the problems of great. the business at the present time; but if a better quality of cows were kept, and more attention paid to feeding and producing, it would not be necessary to cover a very large territory in order to get a good load of milk, and even if the patrons wished to draw the milk themselves, a larger factory could be maintained where a small 'one is now operating. We must remember that, in manufacturing cheese, it is only after a certain amount has been made that any profit can be assured to either the cheesemakers or, if a jointstock company, the shareholders, and that the patrons themselves cannot get as good returns as they would if factories were run on a larger scale.

PRICE OF CHEESE AT SMALL FACTORIES.

Many, of course, will say that the cheese from the small factory sells for as much as from a This may be true to a certain exlarge factory. tent, but I believe that a lot of poor cheese is made in some of the small factories; and, this being true, it stands to reason that the price of large lots of fine cheese are affected by throwing quantities of inferior cheese on the market. The report of the official referee at Montreal this year bears out this statement to some extent. He says that 23 per cent. of the lots of cheese seen by him, under finest, contained less than 30 boxes each. Forty-three per cent. of the lots contained less than 40 boxes; 83 per cent. of the lots contained less than 70 boxes; 93 per cent. of the lots contained less than 100 boxes, and only 6.5 per cent lots of cheese seen by him were lots of over 100 boxes that were classed under finest. Now, these lots of cheese must represent shipments, of not less than a week's cheese, and it seems to me that somebody must have had to lose the cuts for these cheese. If the maker lost it, he can't stay in the business; if the patrons lost it, does it pay to have small factories ? No doubt numbers of other lots of cheese were passed by the buyers, that, although not perfect, still were accepted. It certainly seems that, so far as the small factory is concerned, it will pay milk producers to cooperate in cutting out some of the small factories for the improvement of the trade.

RUSTY CANS.

Any patron of a cheese factory who persists in storing or drawing milk in a rusty can, or using any dairy utensils that are rusty, or in such a condition that they are impossible to keep clean, is not co-operating in any true sense with his neighboring patrons or with his cheesemaker. Rusty cans are the source of all kinds of trouble in the dairy business. The cracks and crevices are impossible to reach with any ordinary methods of cleaning, with the result that they are a prolific source of bacterial contamination of the milk. For the small cost of new cans, it will not pay for a few patrons to injure the product of the others in this matter of rusty cans. But it will pay to have entire co-operation on the part of the patrons along this line, and, when requested by either the cheesemaker or the instructor to get new cans, to do so, for they are undoubtedly in the best position to know when cans are unfit for use. Throughout Western Ontario, 1,688 new cans were bought in 1907 to replace rusty ones.

THE FARMER'S ADVOCATE.

A CREAMERY METHOD FOR THE DETERMINA-TION OF WATER IN BUTTER.

Of methods of determining moisture in dairy products there are just now quite a few. The latest is from the very aggressive Wisconsin Station. The author (Bulletin 154, Wisconsin Agr. Exp. Station) refers at the outset to the importance of knowing how much water the butter of each churning may contain. It is important, in order that the buttermaker shall not exceed the legal limit of 16 per cent. water in butter, and also in order not to make butter which is too dry, as this has a tendency to diminish the churn yield.

The author points out the difficulty of getting a fair sample of butter, and says when the butter is fresh it has the water most evenly distributed. Salt "draws" the moisture into larger drops of brine, which may be pressed out when the butter is cut or sampled. The extent to which brine leaks from the butter depends, to some extent, on the amount of both salt and water present therein, and the hardness of the butterfat.

There is no appreciable difference in the per cent. of water in the top, middle and bottom portions of the 60-pound tubs of butter. Ten grains of butter taken directly from a trier gave, approximately, the same results as fifty grains taken from the same tub when the butter contained no great amount of loose brine.

The moisture is expelled from the sample of 10 grains of butter in about one-half hour, by heating the sample to 240° to 270° F. in a high-pressure steam oven. With a steam pressure of 60 lbs. a temperature of 280° F. was obtained. By employing the boiler pressure ordinarily used in a creamery, a temperature of 240° to 280° F. may easily be obtained.

Special precautions

1. The weighing scale must be easily sensitive to .05 grains if 50 grains of butter are tested; and to .01 grains if 10 grains are taken.

2. The scales must be properly adjusted, kept in a clean, dry place, and protected from drafts of air while in use.

3. The drying pans should be from 4 to 5 inches in diameter when 50 grains of butter are tested.

 The clean, empty drying pans should be heated just before weighing, in order to completely dry them.
The/ butter should be heated until it reaches a constant weight; a second heating and weighing being

always recommended. 6. The hot pans should be placed on a clean piece of tin or a porcelain plate when taken from the oven

to cool. 7. Never weigh the pans while hot, nor after standing an hour or more outside the oven, as they take up moisture from the air.

The conclusion reached is: The results of duplicate analyses by the method here described agree as closely as do those obtained by the usual official chemical method.

Under factors that influence the water content of outter, the author mentions that dry butter can be obThe commercial starter is generally developed from a single micro-organism, and is built up as a pure culture or a known mixed culture. Though the different brands differ more or less as to activity, as well as flavor imparted to butter or cheese, yet, from the very fact that these are pure cultures, uniform growth and acid production may be expected. This being the case, a commercial starter is kept free from contaminations, and, developed under the same conditions, may be used for an indefinite time and produce an unvarying product. It follows that a commercial starter will give more constant results than

the natural. In order to destroy the micro-organisms present in the milk, etc., to be cultured, it must be sterilized or pasteurized. The former destroys all the bacteria, while the latter kills most of them. A temperature of 185 degrees F., followed by rapid cooling, is recommended for pasteurization, which kills 95 to 99 per cent. of the bacteria present. A pure culture added to this pasteurized milk, and allowed to sour, gives a pure culture of desirable bacteria.

The authors recommend a steam sterilizer in the creamery, for sterilizing bottles, milk, etc, and state that such a sterilizer may be made from a common copper wash boiler, or of a bex constructed of wood and galvanized iron. The illustration given in the bulletin shows a vessel with a perforated and also a false bottom, under which latter is a steam pipe for heating. There The glass is also a siphon overflow for water. bottles for the culture rest on the false bottom. After sterilizing the bottles, they are filled about two-thirds full of milk, and the mouths filled in with a dry, firm cotton plug. The contents are then heated to 210 degrees F. for 30 to 40 minutes, for four consecutive days, which will The cotton sterilize small quantities of milk. plug should not be removed after the first heatng, except to introduce the pure culture. The pure culture should be put into the sterile milk very carefully, so as to avoid contamination." For transferring the starter, a vial with wire handle, or a small amount of cotton wound firmly about a wire, is needed. In any case, it must be some thing easily sterilized.

The bulletin concludes : "The method of carrying mother starters in glass jars has been given a thorough trial in practical work in the College creamery, in comparison with the method commonly employed, which is to inoculate a starter each day from the one prepared the preceding day. The new method has the following advantages :

"The starter can be kept pure for a much longer period, thus saving one-half or more of the cost of pure cultures.

"The milk is always ready for inoculation, and the mother starter can be transferred each day, when in the best condition, and kept vigorous.

"In case a starter is not needed every day, the mother starter can be carried along conveniently without the trouble of sterilizing milk.

"We find it no great task to sterilize the bottles of milk once or twice a month, and the little extra labor thus occasioned is more than offset by the convenience and sureness of the new method."

H. **H**. D.

FOUNDED 1866

COOLING MILK.

It is or should be well known, that all milk to be made into dairy products should be produced in the most cleanly way, strained, cooled at once after milking, into clean cans-this to be done for the benefit of all concerned, that the finest dairy products may be made, and consequently the highest price obtained. If there are any patrons who fail to make this necessary effort, they are not co-operating with their brother patrons who do these things, and therefore they have no right to expect an equal share of the It is not fair or just that any patron profits. of a factory should make no effort to produce the very best milk or cream, expecting his neighbors will carry him along with their milk, which has been properly handled.

Now, such being the case, do we find every patron of a factory so conducting his business that he is contributing his share towards the common welfare of the enterprise? If 75 patrons out of a hundred produce sweet, clean milk, and the other 25 do not, these 25 are certainly not doing their duty towards the other 75, and are not co-operating in any true sense.

(To be concluded.)

tained by keeping cream and butter cold, by churning to small granules, by washing the butter very little, and by giving it plenty of time to drain.

Butter of a high moisture content can be obtained by churning longer at a high temperature until the granules are large, and by churning the butter in the wash water.

Water sticks to soft butter, but it is easily pressed out of cold, hard butter.

We should like to warn Canadian buttermakers of the danger of exceeding the legal limit of 16 per cent. water, by adopting hydraulic methods of making butter. H. H. D.

THE PRACTICAL USE OF STARTERS.

Bulletin 246, Michigan Station, deals with the preparation, propagation and application of "starters" for butter and cheese making. We much prefer the term "culture" to "starter." A "starter" is that which causes something to start. The "starter" may be good, bad or indifferent, but it would still be a "starter." In dairy work, we need, in this connection, something to improve the product, hence we prefer to use the word "culture," which comes from a word meaning to "till." The Anglo-Saxon word "till" means to make fit or good, which is much nearer the idea we wish to express.

The author defines starters as belonging to two general classes, natural and commercial. Natural are those originating at home, usually by selecting and setting aside a quantity of carefullydrawn milk until loppered. Buttermilk, whole milk, sour cream, and whey, are sometimes used in this capacity. A starter produced in this way may contain several species of micro-organisms (small plants). Thus, it is not difficult to understand why a starter produced by natural souring may develop taint or become gassy.

POULTRY.

GUESSING CONTESTS NOT PROFITABLE.

The use of trap-nests for some years materially strengthens my belief that they are not used nearly as much as they should be. Every farmer should have a line of trap-nests installed, which could be used as ordinary ones during the seasons when they are not required as traps. They would be useful in the hatching season, by all means. But more than that, they have a place. Often a hen will lay an abnormal egg—off in color, thin shelled, unsightly shape, or, perhaps, too small for marketing. It may be a freak of nature, or possibly the condition of the hen. If a person could bring into operation traps for a couple of days, such hens could readily be detected and the hatchet used.

The most profitable use of trap-nests, however, when they are operated for the whole year. Of course, only a limited number of persons can undertake this work. It takes time and faithful, untiring patience. By those using them steadily, some wonderful revelations are found. Some hens make a great showing for a couple of months, and then give up the race ; whereas they will have some mate in the pen, not conspicuous for looks, but being of sound constitution, and steadily working away for the full twelve months, makes them all take a back seat in the year's record, and turns out to be a champion. Yes, many the hen that would be first selected for the breeding pen (soufar as shape and markings are concerned) is found to be nothing more than a boarder or robber, and not paying for her housing, let alone for the food she consumes. Poultry-keepers should make note of this in securing male birds for