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### Pasteurization of Milk.

An address delivered this week before the Convention of Dairymen of Canada, at Ottawa, by J. F. Tilley, Dairy Superintendent, Woodstock, N. B.

The question as to the advisability of advocating the general use of pasteurization of milk for buttermaking is one on which I am well aware we cannot all agree; for like all other questions it has its good points as well as bad. It seems to me that the first thing for us to consider is the true meaning of the word pasteurization, then to ascertain whether the principal it implies can be adopted and successfully carried out by the ordinary butter makers as we find them in the Canadian Creamery. In the 2nd place it would be necessary to know what effect pasteurization has upon milk and also upon the finished product when it is properly done, then to take into consideration the result of improper pasteurization and its effects on the quality of the butter as well as the market to which it is shipped. In the 3rd place, has the system as practised at the present time in Canada had the effect of elevating the standard of quality of Canadian butter in the British markets? The 4th question for us to consider is, are the pasteurizers now in use so constructed that full and complete pasteurization can be effected and if not what would be the effect of simply heating to a temperature not sufficient to destroy the germ or fulfil our purpose. In the 5th place, have the milk producers of Canada had sufficient instruction regarding the system to prevent them from feeding foods to their stock which would impart to the milk a bad flavour or have they been led to believe that pasteurizing would eliminate the effects of injudicious feeding. Are the buttermakers sufficiently informed regarding the proper preparation and use of starters to enable them to get results that would reflect credit on their work and thus build up a reputation for their butter.

Now we will take up the first point viz the meaning of the word pasteurization, and we find that it means "the heating of milk to a temperature of 155° and maintaining that temperature for 15 minutes or heating to a temperature of 140° and maintaining that temperature for from 30 to 40 minutes. If we only wish to destroy the lactic acid germ a temperature of 140° for 10 minutes will accomplish our purpose.

From the best authorities I can obtain the system of pasteurizing was introduced by Pasteur for the sole purpose of destroying germ life found in milk that would produce disease yet while the system as used by the inventor was not sufficient to destroy all forms of germ life, it would so reduce the possibility of infection that comparative safety was assured. In Canada it seems to be used for a different purpose which is to enhance the keeping qualities of the butter, but from my own experience I am free to admit that I would be compelled to stretch my imagination considerably in order to conscientiously go that far. I have seen a good deal of pasteurized butter, some of it very nice, but I have found as much absolutely poor stock made from the so called pasteurized product as I have seen made from milk or cream treated in the ordinary manner. In our creamery located at Woodstock, N. B., we have for three years been receiving a premium on the butter made, and last season the greater part that was manufactured was sold. This creamery is supplied with cream from eight different skimming stations, part of which is drawn by wagon from 6 to 25 miles while the balance was conveyed by train. I think you will agree with me that the conditions named are not at all favourable to the production of high classed goods. Yet the results are all that could be desired. I merely mention this to show you what can be done without resorting to pasteurization,

and as competition becomes more keen, a more complete inspection of the care of milk will be followed coupled with more complete instruction regarding the care of milk on the farm which will be necessary for the creamery when pasteurization is adopted as for the one where it is not practised. Now to consider the second clause of the first point viz whether the principal it implies can be successfully practiced in the Canadian Creamery. Let me say that with the Pasteurizers now in general use I can see no good reason for believing or supposing that it can. My reasons are obvious, but the principal objection being that the instantaneous process cannot do the work desired. Bacteriological work will sustain me in this. There again I know of Canadian Creamery men who believe that almost any kinds of food can be fed to cows and the pasteurizing process will eliminate the bad results. This may be true to a very limited degree but I am firm in my conviction that if milk is delivered to the Creamery with the flavor of silage or turnips or brewers grains or other such foods, that all the heat you can apply will not render that milk free from those flavours, unless you introduce one of greater prominence.

The second point regarding the effect of proper and improper pasteurization is worthy of mention. To thoroughly pasteurize milk a certain temperature and a given time is necessary, but it has been found that when this time and temperature are used that complications arise which place us in a still more critical position than we yet have been, the much dreaded cooked flavours found to be so objectionable to the British consumer, while on the other hand improper pasteurization will leave the product in as bad condition, and in many cases worse than if ordinary means and care were resorted to. I have been taught, and I have every faith in my instructor, that germ life thrives most rapidly at a temperature ranging between 80 and 100 degrees, and it seems to me that if milk is taken at the creamery at say a temperature of 65 degrees and heated to 140 degrees, then instantly cooled to 55 or 60 degrees, that more germ life will be found in the samples than there was previous to its having been treated, proving the fact that the milk has been heated through the most favourable temperature for a productive growth of germ life and taken to a temperature insufficient to destroy them, then cooled down, again through the favourable temperature to one at which they will in some cases remain dormant. There are no doubts in my mind that the heating of milk or cream for buttermaking purposes to 140° has an injurious effect upon the texture of the butter even if the flavour is not impaired, and as at least one quarter of the value of butter is placed on texture some consideration must be given this point.

In dealing with the third point, regarding the standard of quality of our butter in the British markets, I may say that I have no information which would lead me to believe that pasteurization has improved our position. There is no doubt that Canadian butter has improved in quality, but can we attribute the improvement to pasteurization. Improved machinery and increased knowledge must have had its effects, or our Dairy Schools and Dairy Instructors are causing a waste of money. Then again what is our standing in the world's markets. Only four years ago serious complaints were received regarding the quality of butter made in Canadian Creameries and they are no doubt still coming. When Mr. Arch McNeillage of the Scottish Farmer visited Canada last year he emphasized the fact that Canadian butter was weak in body. Pasteurization produces this result.

The fifth question dealing with the milk producers and the foods they feed to cows is one of great importance, and upon it largely depends the success of the dairy industry.

In some creameries in Canada where pasteurization is practiced milk is taken during the winter season in worse condition than it was a few years ago. Something is decidedly wrong when this exists, and I believe that buttermakers generally were of the opinion that pasteurization would overcome the bad effects.

The sixth point referring to starters is of equal importance for the flavour of butter is greatly influenced by its use and with pasteurized cream it becomes necessary to increase the percentage used very materially in order to bring about the desired amount of acid in a given time. Now supposing this starter is a poor one, caused by its being badly made what is the result upon the flavour of the butter? Some may say that a poor starter should not be used, which of course is very true, but we all know that they have been used and no doubt will be in future. I saw a starter being prepared in the Province of Quebec one time, from the last can of milk taken at the factory that day. It was left in the weighing can to sour of its own accord and at three o'clock in the afternoon you could not see the surface of the milk for flies. The effects of using a starter prepared in this way was very noticeable in that lot of cheese.

Now in conclusion let me say that I am of the opinion that better results can be obtained by a more careful selection of milk, and a more liberal distribution of circulars among the milk producers regarding the care of milk on the farm, than by adopting the present system of pasteurization for it seems to me that we are beginning at the wrong end of the work, by neglecting one important point and adopting a doubtful one. Denmark will no doubt be cited as a country where pasteurization is generally adopted, but when we consider the fact that the dairymen of Denmark are allowed absolutely no rights in the matter because of their being compelled by law to pasteurize, we must conclude at once that a more powerful factor is at work than the mere fact of improvement of the quality of their goods. I have no hesitation in saying that from point of quality Denmark leads the world but she does not stand today in the enviable position she once stood, for her butter was once quoted from 10 to 30 shillings in excess of the quotations for Canadian stock, while I have sold and only this season within half a shilling of her highest prices, therefore when we consider the difference in the distance from market, the length of time which must elapse from the time our butter is made until it reaches the consumer, the transportation, etc., you will agree with me that if we were placed on even footing with our Danish friends we could without doubt secure higher prices. Canada leads the world with a reputation for high class cheese and she can do so with butter providing we begin with the care of milk on the farm, and the members of this congress putting their best efforts into their work and dropping all experiments which have not been proven to be of undoubted value. We cannot depend on our Dairy Schools to prove results of experimental work because Dairy School conditions are not factory conditions, and our reputation is made or ruined by the product turned out from our factories.

### The First Baby.

What joy there is in the home when the first baby comes, and yet to the young and inexperienced mother who has to care for it there is no other period of her life so trying. In the little ills that are certain to come the inexperienced mother scarcely knows what to do. To the young mother—to all mothers—Baby's Own Tablets are a real blessing. They promptly cure such troubles as constipation, colic, sour stomach, diarrhoea and simple fevers. They break up colds, destroy worms, allay the irritation accompanying the cutting of teeth and prevent more serious ills. These Tablets are sold under a guarantee to contain no opiate, nor any other of the harmful drugs always found in the so-called "soothing" medicine. They are good for all children from the new born babe to the well grown child. If you do not find the Tablets at your medicine dealers send 25 cents to The Dr. Williams Medicine Co., Brockville, Ont., and a box will be mailed you post paid.

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### MARRIED.

FOSTER-McKAY.—At Woodstock, N. B., October 31st, 1903, by the Rev. Z. L. Fash, Odber M. Foster and Miss Rachel McKay, both of Houlton, Maine.

BIGGAR-DEMERCHANT.—At Bristol, on October 28th, by Elder D. E. Brooks, Ezekiah Banks and Miss Hattie M. Holmes, both of Kent.

CLARK-CLOWES.—At Grafton, October 27th, by the Rev. F. A. Currier, L. A. Clark, of Hartfield, to Miss Emma Clowes, of Grafton.

CORDELL-YOUNG.—At Woodstock, on the 31st instant, by Rev. F. A. Currier, Mr. Wm. T. Cordell, of Millinocket, Maine, to Miss Jennie Young, of Hodgdon, Maine.

### DIED.

BRADON.—At Grafton, Saturday, October 24th, Elsie, beloved wife of William H. Bradon, in the 39th year of her age. She leaves a husband and three children to mourn the loss of a kind and affectionate wife and mother.

### The Booklovers.

The subscription to the Booklover's Library is rapidly nearing completion. Only a few more names are required to make this proposed institution a permanent feature of Woodstock. The Booklover's is undoubtedly superior to any public library that a town of this size could support. It is, perhaps, the only sort of an institution that we could, at all, afford to keep up.

In preparing a list of suspected readers, the local promoters were surprised to find that 100 names nearly exhausted all their resources. That number may represent an average culture of small towns; but it seems a small proportion in a town with a population of 3000. The booklovers will meet the local literary requirement of today; it will do more. It should create a deeper interest in wholesome and permanent literature; and divert the popular mind from sensational and transient journalism. The booklovers will be an educational factor in the community and is bound to promote a true literary culture among all classes of readers. It may not be out of place to mention that Woodstock is the fourth town of the Maritime Provinces in which the booklovers has been established. The other places are St. John, Halifax and Yarmouth, N. S.

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