

DAIRY

Cows of mature age lower the average production of a herd just as often as heifers. Many cows are kept too long. If a dairy herd has a certain average production of milk, it follows that some individual cows in the herd must be below the average, and others much above it.

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Oregon cannot yet be considered a dairy State, but during the past year or two her farmers have gone rapidly into dairying. In the year of 1907, over \$17,000,000 worth of dairy products was produced. If, in the next ten years, the increase of dairy products is as great as it has been in the past five, Oregon will rank among the leading dairy States of the country.

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The Maryland Experiment Station has been making tests as to profits in selling dairy products as milk, cream and butter. This test shows that cream is one of the most profitable forms of sale, when 20 per cent. cream can be sold at 50c. a gallon, and even at this low price returns 23½c. per pound for the butter in the milk, besides leaving the skim milk for use on the farm. Of course, cream can be usually sold for more than 50c. per gallon. It appears that milk shipping is ordinarily more profitable than butter. Thus 12c. per gallon for 3½ per cent. milk is equal to 23½c. per pound of butter, while at 15c. per gallon for 3.6 per cent. milk the butter is sold at 32½c. per pound. In selling cream at 70c. per gallon, the price obtained is equal to 33c. for the butter, but creameries never pay this amount, and no home-made butter brings any such price, except for a very few gilt-edge makes.

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The farmer who is not able to join a cow-testing association, or to have samples of his milk tested for fat, need not be deterred from keeping a record of weight of milk only, for the information such a record will give him will be found very useful in determining the relative value of the cows.

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George P. Grout, B.S.A., formerly of Parkdale, Man. has recently been elected by the Board of Regents of the University of Minnesota to the position of Assistant in charge of Dairy Bacteriology.

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We have in our stable, says Prof. H. H. Dean of Ontario Agricultural College, a Holstein which has produced 2,522 pounds of milk in 30 days, within 500 pounds of the average annual production of cows of Ontario and Quebec. In 7 days she gave us 643 pounds and in one day 96 pounds of milk. If we had cows like that there would be no trouble about having plenty of milk to drink. A man cannot afford to keep cows that produce only 3,000 pounds of milk in a year.

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The relative amounts of cream and skim milk which come from the separator are determined by the rate of the inflow of the milk, speed of the bowl, temperature of the milk and the adjustment of the cream or skim milk screws. The larger the volume of skim milk entering the separator bowl in a given time the thinner the cream; the greater the speed for a given inflow of milk the richer the cream, or the higher the percentage of fat in it; the higher the temperature of milk at separating the less the volume of the cream and the higher its fat content; the smaller the outlet for the cream, and the nearer it is to the center of the bowl the richer is the cream; the larger the opening for skim milk (in case of a skim milk screw) the richer the cream.

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Pure milk agitations are of periodic recurrence. Generally, early in the summer, increasing infant mortality directs our attention to the milk supply, and a lot of time, ink and paper is devoted to discussions of the problem. Unless some contagion lingers along rather later in the fall than usual there isn't much talk of impure milk after October or November, and milk users have six or seven months of peace. Then trouble begins again. Indignant purveyors of milk are requested to clean up. Outraged cow owners submit to the humiliation of having their bovine possessions examined and tested for all manner of disease. Doctors hand out interviews, bacteriologists ray forth a lot of startling information and substantiate what they say by the most amazing arrays of figures, said to represent the number of disease producing organisms found in something less than a quarter of a teaspoonful of milk. All of which is disconcerting, not to say alarming, to the average head of a household and father of a family. The wonder of it all is that any of us ever managed to survive the milk consuming stage at all, beset as we are by such disease dangers as impure milk

Sterilized Milk

Where skim-milk has to be kept for some time after it comes from the separator, and difficulty is experienced in keeping it sweet, sterilizing, or pasteurizing as it is generally called, may be tried. To pasteurize, it is necessary to heat the milk up as rapidly as possible to a temperature somewhere between 160 and 170 degrees, F., hold it at that point for fifteen or twenty minutes, and then cool as rapidly as possible to as low a temperature as the cooling facilities at hand will enable you to reduce it. Milk so treated is nearly free from the bacterial forms that induce souring and unless re-infected will remain sweet for a considerable time. It must be remembered though that the cooling part is quite as important in this process as the heating. The organisms producing fermentation and the formation of acid, develops most rapidly in a medium at blood temperature. If milk is allowed to cool down slowly to air temperature, which in summer is 70 or better, exposed to re-infection, there is a long chance that the heating will be of very little avail. The milk will sour in very nearly as short a time as it would without sterilizing at all. If a man has a good cool spring and can get the cans into water at a temperature around 50 degrees, sterilized milk will keep sweet for a good many hours longer than the unsterilized material. Heating the milk does not in any way improve it as a feed. German experiments tend to show that pasteurized milk is no better in calf feeding than ordinary untreated milk. Where milk is kept for feeding some hours after separating, however, the pasteurized product gives best results. It contains fewer bacterial organisms than the other and is less likely to cause scours.

Difficulties in Churning

1. What is the cause of butter coming soft when cream is kept in a cool cellar at a temperature of from 60 to 65 degrees Fahrenheit? The cows are all fresh. The butter when it comes is greasy and soft, but tastes sweet. Cream is separated twice a day and cooled before mixing.

Sask.

J. M.

2. When I churn I cannot get the butter to come in any but very small granules. What is the matter, and what would you advise.

Sask.

Mrs. P.

Ans.—1. In all probability you are churning at too high a temperature. If you are skimming a heavy cream (30 to 35 per cent. fat) cool it to about 50° F., or say 53 to 54° F., if the cream is only 20 to 30 per cent. fat, and hold at this temperature for at least four hours before churning begins. This will overcome the difficulty.

2. You do not state whether your difficulty occurs before or after the buttermilk has been drawn off. If before, the chances are that your cream is too thin. But butter should never be churned into one solid piece. As soon as the granules are the size of wheat and the buttermilk appears blue, the buttermilk should be removed. If you cannot get the butter to gather into granules this size draw off a portion of the buttermilk and complete the churning. Of course you can avoid a repetition of this difficulty by skimming a heavier cream next time, say 30 to 35 per cent. fat.

Washing the butter with very cold water is the only thing that would tend to prevent the butter granules from uniting during working.

M. A. C.

W. J. CARSON.

Buttermaking on the Farm in Summer

There are three circumstances in which buttermaking on the farm in summer may be counteracted: First, when the situation is such that it is impossible to send the milk or cream to a creamery or cheese factory; second, where the farmer has a particularly high class private trade to supply, has proper facilities for carrying on the work, and can make more from his cows by home butter-making than by sending the raw product to the creamery; and third where a man has one or more cows, but not enough milk to be worth while sending out to a factory or creamery where butter is made only for home use. It is the first and third of these classes that usually have trouble, making butter in summer. The man catering to a private trade generally knows enough about the business to worry along safely. If he doesn't it won't be long till he's in the "down and out" class so far as butter goes.

It is difficult in the summer season to have cream in as good condition for churning as in winter. If it is gathered by the gravity creamery system, in pans or long cans, it is likely to be too thin for best churning, and in addition, undesirable fermentations arise readily in cream at this season, due to the temperature at which it is generally held. One way to overcome the development of these ferments which give rise to undesirable flavors, and retard the formation of butter when the cream is being churned, is to pasteurize the cream immediately it is skimmed, and hold it at as low a temperature as possible

until enough is on hand to make a churning. Pasteurizing is not a difficult operation. All that is required is to heat the cream up to a temperature of 170 to 180 degrees Fahrenheit, hold it around that point for fifteen or twenty minutes, and then cool down as rapidly as possible to as low a point as the facilities at hand will permit, holding it at a low temperature until sufficient has been gathered for a churning. Heat up a pan or can of water to this temperature and place the vessel containing the cream into it, stirring the contents frequently to induce rapid and even heating. This destroys most of the organisms that produce undesirable flavors, including the ferment that causes ripening, and if a temperature low enough can be maintained the cream will hold several days without souring. Each skimming, as it is gathered, is mixed, after pasteurizing and cooling, with the supply already on hand, the whole being thoroughly stirred up. If the heating is carefully done, there is little danger of affecting the cream injuriously. When sufficient cream is on hand a starter is added, the cream ripened and churned.

A starter is simply some milk in which the lactic acid ferment has been allowed to develop until it contains millions upon millions of those organisms that induce the souring or ripening of milk and cream. A satisfactory starter may be made by allowing some fresh milk to "lopper" by holding it at a temperature of 60 or 70 degrees, and then adding this to the cream about to be ripened for churning. Pure skim milk makes perhaps the best home-made starter. Cultures also are for sale by dairy supply houses that give satisfactory results.

When enough cream for a churning has been gathered, it should be brought up to a temperature of between 60 and 70 degrees, and one pint of the starter added for each gallon of cream to be churned. Have the temperature as near 65 as possible during the ripening period. It is rather difficult to determine exactly when the cream is "ripe" for the churn. At the proper stage the cream is thick and glossy smelling and tasting slightly sour. When this condition is reached it is ready for churning, and, churned at a temperature of about 60 degrees, should form butter in a reasonable time, inside of half an hour anyway.

The other difficulty in summer buttermaking, thin cream, is rather harder to manage. It is more likely to occur where gravity creaming methods are employed than where a separator is used. Thin cream takes a long time to churn, there is a serious loss of fat in the buttermilk, and a poor quality of butter is almost certain to result. If cans or pans are used in creaming, the product resulting is found to be rather thin, where cream separators are used it is possible to adjust the cream or skim milk outlet so that the machine will produce a cream of the desired "richness."

A thin cream may be churned at a rather higher temperature than a thick or medium cream. A temperature of from 65 to 68 degrees will catch it about right. The butter will be longer in coming because the fat globules that bunch together to form the butter granules do not pack so readily; and quite a portion of the fat is bound to escape in the buttermilk. About all that can be done is to churn away until the granules form. Then if a portion of the buttermilk is drawn off, and the churning continued, the butter may be gathered. A common practise with housewives when the butter does not form readily, is to throw in a quantity of water, some use warm water, others cold, but water added only increases the trouble. It makes the cream thinner still, and delays still longer the coming of the butter.

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Before the Royal Institute of Public Health of Great Britain the other day, the Medical Inspection officer for Portsmouth stated that in the British Isles each year 60,000 people died from tuberculosis and that of this number 11,000 was of children under five years of age. He declared that 10 per cent. of the milk sent into Leeds, Birmingham, Manchester, and Liverpool contained living infection of tuberculosis.

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