

It has been argued that this class was not practicable, because of its interruption to its records in progress. However desirable it may be to repeat records, most breeders, having got their cows in the official list with a year's creditable record, do not repeat, and, therefore, having completed a year's record, their appearance in the show-ring, fresh within a reasonable time, is excellent evidence that their year's record has not hurt them, if with this record they combine high individual excellence. The appearance in this class of the world's record Jersey, not only hale and hearty at twelve years of age, but actually freshening during the show, was evidence of the correctness of this contention.

The winners in the Guernsey class at the 1909 Dairy Show scored, respectively, 94 and 92 points; in the Jersey class the scores were 123½, 112½, 103½, and 99 points.

As an initial recognition of performance and individuality in the public show-ring, the figures furnish material for thoughtful consideration by students of the dairy cow.

While it happens that in the Jersey class the cow winning first place had the highest score on both conformation and performance, the same was not true in the Guernsey class; and the Jersey ranking second in total score was second for performance and third in conformation.

The result of this work has already borne fruit, in that State and local fairs are introducing this class. There is no reason why local fairs should not recognize, on this same basis, the grade cow sired by a registered bull of a recognized dairy breed, and having a yearly record made under the supervision of one of the cow-test associations.

H. E. VAN NORMAN,
Secretary and Manager.

Cow-testing: Reasons and Results.

I.

Written for "The Farmer's Advocate" by C. F. Whitley.

WHAT IS COW-TESTING.

Cow-testing is more than the occasional use of scales and sampling dipper to obtain an idea of weight of milk and percentage of fat. It is a great aid in training the herd-owner's sense of observation of details; his success largely depends on systematic perception of the innumerable little things round the farm that affect milk yields and demand attention. A large number of these influences are reflected at the milk scales, and watchfulness of the wavering dial hand will quicken the perceptive faculty.

Cow-testing is the basis of herd development; it is a calm calculation of the merits of each individual, irrespective of price paid or sentimental attachment to any attractive but unprofitable specimen. It is a sure method of discrimination, in fact, the only method yet known in determining satisfactorily which cows to keep as foundation stock of the profitable herd. A record is essential, if one would act unerringly in selecting the paying animal, and thus build up a creditable herd, each cow developed to her utmost, and making substantial returns.

Cow-testing is a source of inspiration to every farmer who is a real man. Fashioned himself in the image of the only Being who can create and endow with life, it brings him into intimate relation with nature's mysteries, compelling him to investigate, to search for the reason and the "why" of the forces which he can subdue and mould to supply his necessities.

Cow-testing is one of the strongest educative influences on the farm. It interests the hired help, and binds the family together, as father and daughter or mother and son not only compare records, but inquire and consider what means to adopt so as to give each animal the best possible conditions and opportunities.

It paves the way for a clearer understanding and a real (often much needed) partnership between father and son. The head of the family may have learned, while taking milk to the factory, that a neighbor has delivered just as much milk from seven cows as he has brought from ten or eleven. In retailing the fact on his return home, his criticism—possibly his sarcasm—may rankle in the breast of the growing lad, who really needs encouragement, not implied censure. Right at this point is there not apparent a crying need for fuller discussion of conditions, more comparison of best methods, an active co-operation between parent and child, not only that the necessary improvements may be instituted, but that the boy may have a freer hand, more latitude for his own ideas, more scope to practice what he believes to be best, and which a trial will prove to be correct? The boy needs consultation, and will help to keep him on the farm.

While cow-testing is an aid to economy, in that it reveals what waste of time and labor and feed on poor cows may be saved, it is also an incentive to liberality, for it shows that good returns are to be had from abundance of choice feed given to a suitable animal.

Cow-testing is no mere fad or unexploited

theory, it is the most practical and workable plan ever offered to a Canadian farmer. Farmers themselves by the score say so, and write to that effect. That it is profitable in the extreme, has been abundantly proved. It has helped many a struggling land-owner to a position of comfort and affluence; it commends itself to the poor farmer as a means of quickly augmenting his income; it appeals to the farmer in moderate circumstances as a stepping-stone to better achievement, and is in complete harmony with the aspirations of every thoughtful farmer who desires any measure of progress. Read this as a sample of statements received at our office from time to time:

A. W. Haine, of Dewdney, B. C., writes: "When we joined the cow-testing association, in 1908, we had 21 cows, aged between four and seven years, with an average yield of 6,800 lbs. milk. In 1909, our 21 cows averaged 8,360 lbs. milk. We have 16 pure-breds and 5 grade Holsteins. I would not think of stopping weighing and testing our milk, as I feel satisfied that if a dairyman looks well to the sire of his herd, and weighs and tests, his herd is bound to improve, and the hired men take more interest in their work. We commenced dairying 8 years ago, with the intention of bringing our cows up to an average of 6,000 pounds milk each, which we did in about five years."

The increasingly numerous records of 8,000, 10,000 and 15,000 pounds of milk, or even higher, are not only highly satisfactory to the owners of such cows, but are of very great help to dairymen in general. The outcome of intelligent selection and unremitting care, they are spurs to better attainment in every dairy district. Further, such records advertise our good name in other countries wherever is found the large-hearted friend of the dairy cow, and lead to helpful interchange of dairy ideas, besides attracting desirable immigration and investment of extra capital.

Pasteurization Problems.

Editor "The Farmer's Advocate":

Your correspondent, T. H. L., in the May 12th number of your journal, brings up some pasteurization problems of interest to Canadian creamerymen. Considerable prejudice exists in the minds of many creamerymen against pasteurization, and there are doubtless difficulties in following the system. Having practiced pasteurization since 1895 in the College creamery, we may be allowed to make a few observations on this question, based largely on our own experience.

We first adopted the crude method of pasteurizing cream in shotgun cans during the winter of 1895-6, and found a marked improvement at once in the quality of our butter. We were able to get rid of many taints, such as turnip and stable flavors, which characterized our winter make. It was a great relief to be able to ship butter about which there was practically no complaint. Previous to that time, in spite of the greatest care and the best skill, we frequently received reports from our customers complaining of bad flavors. As we were "green" at the creamery business, we scarcely knew what to do. It was not at all satisfactory to have College butter faulted in the style too common among critical judges. After our visit to Denmark, in 1895, we felt satisfied that pasteurization was the solution of our troubles. I am pleased to say our diagnosis proved correct. Since that time we have had little or no trouble with flavors, the demand for our butter is increasing continually, and our prices are equal to or above average creamery prices. Our average overrun for the year 1909 was about 18 per cent. Anyone who knows the conditions under which our creamery is operated will admit that this is a good showing. While we have certain advantages, there are disadvantages with us, as with all public institutions, which more than counterbalance advantages in the way of reputation, machinery, skill, etc. We have found the best results, so far as temperature is concerned, by heating milk or cream for buttermaking to a temperature of 180 to 185 degrees F. At this temperature, more than 99.9 per cent. of the bacteria are killed, which gives us practically a clean seed-bed for our lactic-acid culture (starter), when ripened-cream butter is made. At this temperature we have little or no trouble with curdling—in fact, cream with an acidity of .35 per cent. and over appears to go through the pasteurizer with less trouble than that having an acidity between .25 and .3 per cent. Cream with this acidity seems to "coat" on the inside of the pasteurizer in such a way that the heat is not transferred to the product, and it is difficult to heat the cream in a continuous pasteurizer to the desired temperature. We have not yet discovered the exact cause of this "coating" on the inside of the machine, but it appears to be associated with an acidity of about .27 per cent. in the cream. We are planning some experiments with "viscogen" during the coming summer. Last year

we tried neutralizing the acid in cream with lime-water before heating, but the results were nil. Whether or not succrate of lime will prove any better, remains to be seen.

Were it not for the tendency for an excessive loss of fat in the buttermilk where sour cream is pasteurized, there does not appear to be any great disadvantage in pasteurizing sour cream. That the tendency is for an increase of fat lost in the buttermilk, as the acidity of the cream increases at the time of heating, is shown in the following experiments:

Cream having an average of .35 per cent. acid, or less, gave buttermilk with .133 per cent. fat.

Cream having an average of .35 to .4 per cent. acid gave buttermilk with .2 per cent. fat.

Cream having an average of .4 to .45 per cent. acid gave buttermilk with .232 per cent. fat.

Cream having an average of .45 to .5 per cent. acid gave buttermilk with .335 per cent. fat.

Cream having an average of over .5 per cent. acid gave buttermilk with .522 per cent. fat.

These results show quite clearly that as the percentage of acidity increased in the cream at the time of heating, there was quite a marked increase in the percentage of fat contained in the buttermilk after churning. There is one feature of the case that is not easily explained. There is not always this marked loss of fat in the buttermilk, as a result of churning cream which has been pasteurized at high acidity. Why this is so, we are unable to explain at present. The general explanation of high loss of fat in the buttermilk, as a result of heating cream which is sour, seems to be that the casein coagulates to a greater or less extent, and entangles with it more or less of the fat globules, which are not churned, and appear as fat in the neck of the Babcock bottles when the buttermilk is tested. But why this is not always the case, has been, and is, a perplexing proposition.

Your editorial comments re "double pasteurization" and "metallic flavor" are quite correct, so far as our experience goes. In large creameries, we do not believe it practicable to pasteurize the cream to a moderately high temperature, allow to stand for twenty minutes, then heat to 180 degrees F. Neither can we see where any advantage is gained by such a system. Heating to 125 degrees F., and allowing to stand, means that the cream would probably cool to about 100 degrees F. before the second heating would take place, and this is a very favorable temperature for bad-flavored organisms to develop. It strikes me that it would make the difficulties of effective pasteurization greater, by allowing the cream to stand at this optimum temperature for bacterial growth, because 125 degrees F. is not high enough to have any deleterious effect upon the micro-organisms present in the cream. Leaving out the practical difficulties, from a theoretical viewpoint, we fail to see where double pasteurization, at the temperatures given, can be of any advantage.

With reference to "metallic flavor," this, if investigated, will be found to originate in pipes or pasteurizers which are not properly cleaned. Some buttermakers seem to be of the opinion that the running of hot cream through a machine, or pipes, will of itself cleanse them. This is a great mistake. There will always be some cream remaining on the inside of the pipes. As soon as the pipes and cream cool, the organisms, present everywhere, begin working on this residue, decomposing it, and possibly also the metal to some extent, through the formation of weak acid. When the next lot of hot cream is forced through the pipe, it carries with it into the cream vat, or churn, the bacteria and their products, including the metallic decompositions. We venture to assert that if pasteurizer, pipes, and all vessels coming in contact with cream heated to 185 degrees F. are kept clean, there will be little or no trouble with "metallic flavor."

More skill and care are needed to make pasteurized-cream butter than is required for the manufacture of the raw-cream product, but the results will pay for the extra expense and skill needed. Some have tried, and failed, because the conditions were not satisfactory. These conditions are a good pasteurizer, plenty of steam, an efficient cooler of large capacity, plenty of cold water, a good culture for ripened-cream butter, brains and skill on the part of the buttermaker. These have won Denmark her proud position in the butter markets of the world. Why not Canada?

H. H. D.

Cream Prices Based on Quality.

Grading cream, and the quality basis as payment, was the motto adopted at the Alberta Buttermakers' Convention. All the cream received at the different Government creameries throughout Alberta this year will be sampled and graded. He who sends cream possessing consistency and quality to marshal it into the ranks of first grade will receive a premium of two cents for his cream over the man who is content to file below him. Good cream is the first essential of good butter, and the best butter brings the best price.

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