

health of the poor, attended to at once. Only 10 per cent. of the dairymen of the matter, and to help e of dairy products. Now that 20 per cent. ering from malnutri- ent food but rather shown that the type o fails when adopted

ers to give him their up to the individual strate this important nts in city, town or o much upon cereal mmunities should be eprepared, showing the y products as builders- speaker said he was n the public health Holstein-Friesian As- me point of view, plus

ideas of the foreign- Dr. McCollum stated d to stint themselves, e of not buying the n sufficient quantities. y poor quarter of all orn people should be milk as one of their ion must be given to igh through this source ric can be developed

Milk.

ed "What is an in- answer, people would was asked "what is ould answer correctly? e get from the cow." itish fluid secreted by es. As we are prin- k, we will consider it

ow's milk is: Water, casein, 3.25 per cent.; ash, 5 per cent.; ash, .75 s, however, with the of lactation, and ex- fat content of milk is consider this first. orm of globules, about hich are composed of of which are palmitin, e globules are lighter n subject to the force hen subject to centri- rator, the fat is forced however, a distinct fat and butter, as the t and the latter milk nt of water, salt and contained in milk is Babcock test, which ric acid to a certain e milk solids, the ntrifugal force which

avish white powder n cheese making. It nufacture of imitation is nearly the same d is of about the same milk is boiled the co- os on the surface is re state, resembles ance, but not in se, plays a very im- of butter and cheese, is caused by certain g lactic acid, which ompose, and separates rings us to the subject containing sugar and ce for bacteria.

vided into two classes, injurious to human inly of the typhoid d tubercular bacteria, of lactic acid bacteria. at are principally re- d it has been proven e produced and kept pt sweet indefinitely. duce milk free from ts to keep them down e milk sweet as long ave his milk returned ew simple precautions produced under clean will keep a lot better elly stable, swarming ing all over the place. among some dairymen effect can easily be middle of milking and

noticing the dirty milk dripping into the pail. If the cow has got used to being milked with wet hands, a little chemical vaseline can be used. This, besides being far cleaner, is an excellent thing for cows' teats.

The milk-strainer is also a very important thing. This, to be of very much good, should consist of at least four thicknesses of cheesecloth, if a cloth strainer is used, or two thicknesses of cheesecloth, with cotton between them. This not only keeps the visible dirt out, but also a large number of bacteria. If possible, as soon as the cow is milked, the milk should be carried away from the stable into the dairy, because if the milk is poured into a can or another pail in the stable, in passing through the air it is liable to get tainted. Another way a large amount of dirt gets into the milk is from the cow itself, through dirt and hairs dropping into the pails during milking. This can be largely avoided, if time permits, by curry-combing and brushing the cows once a day. This not only has a good effect on the cleanliness of the milk, but is also very good for the cows, as it stimulates the blood and makes the skin soft and pliable.

I have, no doubt, a good many farmers having read so far will say to themselves, "Why should I worry about strainers, or a little dirt in the milk? I get paid just the same for my milk." It is there that they make their mistake. Suppose the milk is sent to a cheese factory. Ask the cheesemaker what is the cause of poor-quality cheese, and he is almost sure to answer "poor quality and dirty milk." Poor cheese does not sell as well as good cheese, nor, if the milk is not good, will the amount of cheese per hundred of milk be as great. Therefore, in two ways the farmer will not get so much for his milk. This not only applies to cheese making, but also to the creameries and condenseries.

Another point to be borne in mind is that if poor or dirty milk is mixed with clean milk, the bacteria soon multiply and effect the clean milk; therefore, by one man in a community not caring whether his milk is clean or not the careful farmers have to suffer, and surely no Canadian farmer wishes another farmer to lose money because he is too lazy or careless to clean up the stable or dairy.

Middlesex Co., Ontario.

E. C. C.

Quality of Cream For Churning.

One of the reasons why creamery butter possesses a greater degree of standard quality and uniformity of grade is that the factors which contribute most to the manufacture of high-grade butter are more easily controlled in the creamery than in the farm dairy. Temperature, for instance, is one of the most important factors, if not the most important factor, influencing the churning process. It is necessary to have the globules of butter-fat sufficiently warm so that they will stick together, but on the other hand if the cream is too warm when churned the butter will be greasy, or there will be a greater amount of butter-fat lost in the buttermilk. If the temperature is too low the cream will whip instead of churn, in which case it is necessary to remove part of the cream from the churn and warm it sufficiently to raise the entire quantity up to the proper temperature. The danger of adding warm water is that some of the butter-fat will be melted, and, moreover, the buttermilk will be diluted. Where a hand-churn is used and the cream tests 30 to 40 per cent. butter-fat, the temperature should be from 56 to 62 degrees Fahrenheit. In the creamery the temperature should be from 48 to 54 degrees Fahrenheit, and cream should be lowered to these temperatures for several hours before the churning actually takes place, so that the fat will have plenty of time to re-crystallize or harden. Careful regulation of the temperature will help along, with other factors, to keep the butter from having a broken grain, and from being greasy. When all the other factors are normal the temperature should be such as will allow the churning to be completed within a-half to three-quarters of an hour.

Rich cream will churn more readily than poor cream, for the simple reason that there is a comparatively small amount of other material in the richer cream to prevent the cohesion of the fat globules and for this reason cream for easy churning should have some 30 to 40 per cent. of butter-fat. If the cream should happen to be too rich in butter-fat, it will adhere to the sides of the churn and cause difficult churning. Ripe or sour cream has less viscosity than sweet cream. This viscosity consists partly of albumen, which may be seen in the form of slime around the separator bowl after the milk is separated. It will also consist partly of the membranes surrounding the globules of fat. When cream is ripened or pasteurized, the viscosity is broken and, consequently, the cream will churn more easily. Sometimes butter-fat is too hard to churn easily, and in such cases the temperature must be raised higher than usual in order to soften these hard fats. Butter-fat which is high in olein is softer than fat which has less olein and a greater percentage of volatile acid.

The hardness of the butter-fat is affected by feed, breed and individuality of the cow. Such feeds as cotton-seed meal tend to cause a firm body and a better keeping quality. For this reason, cottonseed meal will tend to produce a butter that will stand up in warm weather. This effect of cottonseed meal is due largely to the cottonseed oil. Eckles and Shaw state that the feed of the animal is probably a greater factor in influencing the nature of butter-fat than either breed or individuality. Breed certainly has some influence. Results of investigations at the Indiana Agricultural Experiment Station show that the butter-fat from Ayrshires and Holsteins contains less volatile acids and more olein than from Jerseys, and consequently makes

a softer butter. One would infer that the fat from Jerseys and Guernseys would be more difficult to churn, but actual experience, according to Guthrie, shows that butter-fat from these breeds collects more readily than from Ayrshires and Holsteins, the probable reason being that the fat globules in the milk of Guernseys and Jerseys being larger cohere more readily. This factor, however, is not very important in the creamery where large quantities of cream from numerous herds are being handled. The large fat globules come in contact with each other more easily than the small ones, and anyone who has tried to churn "strippers" cream knows that very often it is more difficult to churn than usual because the fat is hard and the globules are small. It was found at Indiana that milk from fresh cows contains larger fat globules than milk from cows that are well advanced in the period of lactation. The size of the fat globules is also temporarily increased by abrupt changes of feed.

If the churn is too full of cream it is usually necessary to raise the temperature a few degrees, for the reason that in a full churn the agitation is not as great as when the churn is only partially full. For this reason, the latter should be from one-third to one-half full, so as to provide enough cream to fall readily and yet not too much to prevent the required amount of agitation. When too little cream is used, too large a proportion of it sticks to the sides of the churn. In this connection, also, it is advisable to get the greatest amount of agitation possible, but this does not always mean that the faster the churn is operated the greater the amount of agitation. Just before the cream breaks it is very thick and sticks to the walls of the churn, and it is advisable at this stage when using a hand churn to slow up the speed to a certain extent. When the glass in the churn becomes clear, the churning process is nearly completed. Particles of butter should be about the size of a pea or a kernel of corn, since the buttermilk drains off more readily in such cases than where the granules are very small. If churning is continued too long the butter particles collect in large lumps, with the result that too much buttermilk is incorporated into the butter. This means that the sugar, casein and albumen in the buttermilk will attract the growth of bacteria, and the flavor of the butter will be injured.

The purpose of working butter is mainly to distribute the salt, which is applied in varying quantities to suit the market. Working also compacts the butter, and in order to prevent the occurrence of greasy butter, the working should be carefully done. It should be worked until only a few holes show, and if it has not been sufficiently worked, it will appear mottled after it has been made for a short time. The body of the finished butter should be waxy in texture; if it is too low in temperature it will be hard and working will cause it to be talloxy. If the temperature is too high the butter will be greasy. When the working is completed, the butter is ready to be put into packages for the market.

HORTICULTURE.

New Pointers in Transportation.

The information in this article has been received from George E. McIntosh, who is in charge of transportation matters for the Fruit Branch, Department of Agriculture, Ottawa. There are many alterations constantly being made in tariff schedules of express companies and railways, and fruit growers and associations are constantly making representation to the companies for better service facilities. New regulations which appear from time to time are necessary information which the fruit grower should have, and the following notes and comments cover most of the newer changes as respects the transportation of fruit in Canada.

There has been considerable misunderstanding among consignors and consignees with regard to certain proposed regulations covering the payment of freight charges. Mr. McIntosh says, however, that the Canadian Railway War Board agree to make very little change in general shipping conditions, while business principles are applied in making settlement of transportation charges, the bonding feature—to which considerable objection was offered—has been eliminated and credit rules substituted whereby bills or accounts accumulated from the 1st to the 7th of each month must be paid by the 14th; from the 8th to the 14th, must be paid by the 21st; from the 15th to the 21st, by the last day of that month, and from the 22nd to the last day of the month, settlement must be made by the 7th of the following month.

The Dominion Express Company's special fruit tariffs applying on shipments from Ontario points were amended by supplements effective May 7, whereby the cartage service at shipping point was cancelled. This change, however, has since been annulled, leaving for the present the cartage service the same as last season.

For the purpose of improving the working conditions of their employees and to accommodate what seems to be the general public sentiment, the Express Companies have adopted the eight-hour day, effective June 1, 1919. Collection and delivery service will be confined to the hours between 8 A. M. and 5 P. M. Depot offices where night staffs are maintained will be open for the delivery of incoming shipments to consignees calling for them, and for the receipt of outgoing shipments which are not ready when last vehicle call is made.

To meet the wishes of shippers and facilitate distribution of the British Columbia berry and cherry crop, the Dominion Express Company is permitting partial unloading at two intermediate points on shipments of berries and cherries governed by carload Tariff C. R. C. 4540. Cars containing shipments of

currants may be partially unloaded at one intermediate point only. The change became effective June 28.

Special local rates on Canadian-grown berries, cherries and currants in carloads are made effective June 1, 1919, by the Dominion Express Company, from Creston, Duck Creek, Hatzie, Huntingdon, Kelowna, Penticton, Summerland, Vancouver and Vernon, B. C., to Calgary, Edmonton, Camrose, Winnipeg, Moosejaw, Regina, Saskatoon, Weyburn and Yorkton. The rate to Yorkton is \$2.25 per 100 pounds; to all other points \$2 per 100 pounds. These rates expire about August 31, 1919, unless sooner cancelled, changed or extended.

Estimated Weight for Apples.

During the coming season the railway companies will accept domestic shipments of apples in barrels at actual weights. For export shipments, however, the new Canadian standard barrel will be accepted at an estimated weight of 155 lbs. On barrels made from the old stock they will accept shipments from Nova Scotia at an estimated weight of 150 lbs., and from Ontario, 165 lbs. per barrel. Shippers must specify on their shipping orders and bills of lading whether the apples are in Canadian standard barrels or in barrels made from old stock. Where a car contains both, the shipping order and bill of lading should specify the number of each. Unless this is done railway agents will bill the entire car at a weight based on 165 lbs. per barrel.

If ice is required by shippers at points of origin, in transit, or at destination, on carload shipments or perishable freight in refrigerator cars, the following charges will be made: 1, When furnished at all stations except as shown in paragraph (2) \$4 per ton; minimum charge for each icing, \$2 per ton. 2, When furnished at points in British Columbia, including points in Alberta West of Edson on G. T. R. Ry., \$5 per ton; minimum charge for each icing, \$2.50 per ton. Salt, when furnished in connection with icing will be in addition to the cost of the ice, and will be charged for as follows: At all stations each of Duluth, St. Paul, Minnesota Transfer, Minn., Fort William Port Arthur, Westfort and Armstrong, Ont., 75 cents per 100 lbs.; minimum charge 75 cents.

Beginning July 1, the Canadian railways resumed the issuing of through bills of lading through Canadian North Atlantic ports. Since the fall of 1914 initial line railroad receipts have been sent to seaboard to be exchanged for ocean bills of lading, which were issued and returned to carrier for surrender to shippers, except where shipper had their representatives at seaboard. All this delay will now be done away with.

The recent change in C. P. R. Tariff No. W4143, whereby only one change of destination was permitted, and in regard to which considerable complaint was made by British Columbia fruit shippers, will, on and after July 5, be amended to apply on traffic other than fruit and vegetables. It is possible, however, the privilege may be limited to two changes for these commodities.

Miscellaneous Notes.

Improved shelter accommodation at Penticton for express shipments of fruit was asked for in the fall of 1917. Advice has now been received that the Kettle Valley Railway Company have erected a shelter 40 by 60 feet, slatted sides, and so arranged that teams can drive under cover for unloading purposes.

An improved service for the fruit shippers around Erickson, B. C., will be provided by the Dominion Express Co., this season, by the appointment of an agent at that point.

Some shipments do not reach the markets in proper condition because of illegible writing; labels will not stick on; tags which tear apart or are easily pulled off; two or more addresses on a shipment; pencil marks easily rubbed off in transit by dampness.

The Canadian Express Company established the regular daily special fruit train service in the Niagara district on June 23. This is about ten days earlier than usual, but it was found necessary in order to maintain as efficient service as possible.

Cost of Growing Strawberries.

W. T. Macoun, Dominion Horticulturist, Ottawa, gives, in a recent bulletin entitled, "The Strawberry and Its Cultivation in Canada," some estimates as to the cost of growing an acre of strawberries, which we reproduce herewith. Generally speaking, estimates are not altogether reliable, and, gathered as these are, from correspondence with different growers, it would be unwise to treat them as absolutely correct. Moreover, one should always remember that the cost of production will vary with different sections and under different conditions. There are fourteen estimates given in the accompanying table, numbers 1 and 2 being from Prince Edward Island; 3 and 4 from Nova Scotia; 5 and 6 from New Brunswick; 7 and 8 from Quebec; and the remainder from Ontario, with the exception of No. 13, which is from British Columbia.

It will be noticed that the figures vary very widely. In the first instance the amount allowed for rent of land varies from ten to fifty dollars per acre, while the preparation of the soil costs from five to thirty dollars per acre, with an average of perhaps fifteen. Fertilizers cost anywhere from forty to two hundred dollars per acre, with an average of between fifty and one hundred. Even the cost of plants varies greatly, from \$17.50 in one instance to \$56 in another. The cost of planting is fairly uniform, although even here the figures vary from \$7 to \$22.50. In one instance it cost \$115 to cultivate the young patch, but in most cases this was done for less than \$50. The cost of mulching, which is very important, in no case runs over \$45, and in most cases from \$10 to \$20. About \$40