

ashes or Sapolio soap should be used occasionally to help keep the cans, pails, etc., clean and sweet. The airing of tinware is an important matter. The oxygen or ozone of the atmosphere assists materially in the sweetening or purifying process.

Our next article will deal with the creamery and its equipment.

[NOTE.—When we consider the fact that in 100 lbs. of milk there are about 87 lbs. of water, Mr. Sleightholm evidently did not urge the point re abundance of pure water too strongly. We know of one case this season where a farmer's milk supply fell off from 600 to 300 lbs. per day, and on enquiry found that the cows (about 25 of them) were being driven some distance and watered by pails from well once a day. If a dairy farm has not a stream or pond of pure water, a convenient, never-failing well is indispensable. Where the herd is large many dairymen find that it pays to erect a small windmill.—EDITOR.]

The Production of Milk for the Manufacture of Cheese.

BY J. A. RUDDICK, SUPT. KINGSTON (ONT.) DAIRY SCHOOL.

The Influence of Food.—There are various ways in which food may have an effect on the character of milk from a cheesemaking standpoint. Some foods, such as turnips, rape, etc., impart their peculiar odors direct to the milk through the essential oils which they contain. The cause of the odor really becomes a part of the milk and is not easily removed. All such foods should be prohibited, and the feeding of turnips to milch cows, attended as it is with such evil results, must eventually be entirely stopped. I have known cheesemakers to claim that they could remove the flavor of turnips during the process of cheesemaking, but the thing is absurd, and sooner or later the man who depends on his skill (?) to remove the taint of turnips will himself be "removed."

There are foods which may, if fed injudiciously, cause indigestion in the cow, with the result that the milk will be "off" flavor. This explains, I think, why trouble has been experienced where cows have been allowed the run of an orchard to gorge themselves on the surplus fruit, although it is a fact that apples may be fed, beginning with a few quarts per day, increasing gradually to not more than half a bushel, without any bad effect. The same is true of clover to some extent, for observant cheesemakers very often find the flavor of milk wrong when the herd has been first turned into a fresh field of clover aftermath. Left to satisfy themselves, they probably eat too much, but, at any rate, we know that indigestion often occurs under such circumstances, and yet no one will deny that clover is one of our most valuable foods.

Musty fodder may indirectly be the cause of tainted milk, by the spores of the moulds which cause the mustiness finding access to the milk at the time of milking, and, developing there, give rise to various objectionable flavors. Indeed, the greatest care should always be exercised to avoid having the milk exposed to the dust which will fill the air of a stable for some time after feeding any dry food. Some claim that the feeding of ensilage has affected the flavor of milk. All I can say on this point is that some of the best milk which we have handled of late years has come from cows that have had ensilage as a part of their daily ration. It is quite possible, indeed very probable, that if cows are fed too much ensilage, or ensilage which is mouldy or very sour, the flavor of the milk will be injured, but I do not believe that good ensilage, properly fed, is in any way objectionable.

The Absorption of Odors.—Milk has the property, in common with most liquids, of absorbing gases or odors, as we call them in this connection. Dr. Russell, of Wisconsin, has shown that warm milk will, in some cases, absorb odors more readily than cold milk. This is sufficient to explain why milk will frequently carry the odor of the surroundings at the time of milking. Among the most common taints of milk contracted by direct absorption are the odors of manure heaps, hog pens, coal oil, rank smelling weeds, and very frequently the characteristic smell which comes from the silo even with the best of ensilage. The remedy is plain. The milk must be protected from anything of the kind.

[NOTE.—It is also a fact, according to our own experience, that cold milk will readily absorb odors. It is therefore important that milk be removed to clean, sweet quarters as soon after being milked as possible.—EDITOR F. A.]

Influence of Bacteria.—While the above causes operate to the detriment of cheesemaking to a considerable extent, they are, perhaps, most applicable in the winter time. Experience is proving every day that the great majority of the difficulties which cheesemakers have to deal with originate with the undesirable form of bacteria which get into the milk. Bacteria are small plants. They are so very small that they cannot be

seen with the naked eye, except when they grow together in immense numbers to form what are called colonies. From the cheesemaker's standpoint, they may be divided into two kinds, viz., the necessary or desirable kind, and the bad or injurious kind, just as there are two kinds of plants in the fields giving us the crops on the one hand and the weeds on the other. The useful bacteria bring about the necessary changes in cheesemaking, and are, therefore, indispensable; while the others produce "tainted" milk, "gassy" or "pinhole" curds and "off" flavored cheese, etc. The investigations of Prof. Lloyd, in England, and Dr. Connell, at the Kingston Dairy School, show conclusively that one certain kind of germ, known technically as the *Bacillus Coli Communis*, which comes from the droppings of all animals, including fowls, is the one great cause of these faults in milk or cheese. To prevent the entrance of this class of germs into the milk will, I believe, do more to improve the quality of our cheese than anything else within the power of the farmers or cheesemakers. It is along this line that we have the greatest need for improvement. So much has been written and said about the necessity for cleanliness in handling milk, with apparently little effect, that it would seem almost useless to go over the ground again; but I think the trouble is that the word cleanliness in its ordinary meaning does not cover the point. It refers to the visible dirt, while in reality the danger lies in the invisible germs which are associated with the dirt. Straining the milk to remove filth is a very necessary and desirable operation, but, after all, milk which is once contaminated in this way will continue to show the effects of it afterwards, no matter how thoroughly the straining has been done.

In conclusion, let me appeal to the patrons of factories to see to it that their milk is protected in every possible way from any contamination which might come from animal droppings in any form. Do not milk the cows in the barnyard, nor keep the milk near it over night, and if a special yard is used

days in milk; 44 pounds 4 ounces milk; of butter, 2 pounds 8½ ounces; butter ratio, 17.37. In the tenants' competition the Shorthorn cow, Athelina, owned by T. Birdsey's executors—weighing 1,319 pounds; 10 days in milk—gave 53 pounds 4 ounces milk; 2 pounds 11½ butter; ratio, 18.58. The Guernsey cow, Bon Espoir V.—weighing 1,100 pounds; 50 days in milk—gave 60 pounds 6 ounces milk; the highest in the test, yielding 1 pound 13½ ounces butter; butter ratio, 33.02. A cross-bred cow, 26 days in milk, gave 57 pounds 12 ounces milk, and 2 pounds ½ ounces butter; ratio, 32.75.

GARDEN AND ORCHARD

Eat More Fruit.

In Farm Gossip, in this issue, our Kent County contributor calls attention to the increase of canning factories in the Western section of Ontario, by means of which the increasing surplus of fruit there will be profitably utilized. Every community should be equipped with facilities for using up fruit when markets become overstocked. Canners and evaporators will save losses and enable a wider distribution of fruit in home and foreign markets. In Great Britain, the manufacture of jam is also a remunerative industry of large proportions, and is likely yet to develop on this side of the Atlantic. Meanwhile we are glad to note the increasing consumption of Canadian fruit both in town and country homes, so that with the development of our export trade the demand should keep pace with the growing supply. In every way possible the home use of fruit should be commended and encouraged. On this point we note the following in the *Rural Californian*: "It is only quite recently that fresh fruit has been eaten as part of our daily diet, although even to-day it is mainly used as more or less of a luxury, to be dispensed with as soon as the pocketbook has no funds beyond those needed for the necessities of life. The time is coming soon, however, when fruit will be the main and indispensable food for those who study to promote health, happiness and sobriety. It is for those who grow the fruit to increase its use locally by experiments and the spread of all facts and literature showing its value for food."

Methods of Keeping and Storing Apples.

Well matured and nicely flavored fruits are worthy of special care in keeping throughout the winter months that they may be had for dessert purposes after their general season is past. With apples, perfect, normal size fruit should be selected and kept in as cool a place as possible without freezing. Large apples that are desired to be kept particularly nice should be kept from touching each other, wrapped in separate tissue papers, or placed on trays in a moist, well-ventilated cellar. For late market purposes pack tightly in barrels after the apples have shrunk, and store the barrels in a very cool place. Some solid apples, like Northern Spy, Spitzenburg, or Newtown Pippin, are not injured by hard freezing, if they are allowed to remain frozen until wanted, and are then thawed out very gradually, but we do not recommend this plan. Many sorts, particularly Russets and other firm varieties, keep well when pitted like potatoes. Sometimes, however, they take up a taste of the earth, but this may be prevented by setting a ridge-pole over the pile of apples in forked sticks, and making a roof of boards in such a manner that there will be an air space over the fruit. Then cover the boards with a heavy covering of straw and a light one of earth. Pitted apples, however, seldom keep well after opening out in spring, and should, therefore, not be opened till they are needed for use.

Another method of storing apples approved by some is to cover them deeply in dry chaff, taking care that the chaff and apples are mixed throughout in layers, exercising care to fill all the interstices and cover up frostproof in a dry location.

It is not usually good practice to pile up deep bins of apples on the cellar floor. Smaller, shallow bins, not disturbed till their turn comes to be used, are much better, except they are commencing to rot, when the bad ones should be removed. This should seldom occur if care has been taken not to put in bruised or fruit of early ripening varieties, and the temperature is kept down below 45° or, if possible, at 33° Fahr. We have had best satisfaction by packing such as Spies, Russets, Greenings, and Baldwins in barrels late in October, and leaving them in an open shed as late as possible before consigning them to the cellar. The barrels are headed up, and not opened till needed in March or later.

Mr. G. H. Shuttleworth, of the apple commission firm of Simons, Shuttleworth & Co., Liverpool, who recently completed a tour among the apple-growing sections of the U. S. and Canada, reports a fair general crop throughout. There will probably be exported from Canada this year some 200,000 barrels.



TWO-YEAR-OLD JERSEY HEIFER, DULOR, 1ST PRIZE, ROYAL SHOW, 1908; OWNED BY MR. JOSEPH BRUTTON, YROVIL; SIRE GOLDEN LAD.

for milking, the milk stand should be at some distance from it, and not in the direction of the prevailing wind, which will carry the dust from the dried-up manure covering the ground of the yard. See that the cows are not compelled to wade through deep mud to reach the water supply, as is often the case. Such places become filled with these dangerous germs, and the mud sticking to the legs and udders of the cows carries them along to find entrance to the milk pail. Do not feed hogs to near the milk stand. It is positively criminal to do so. The milk vessels must be destroyed by boiling water if these germs are to be destroyed. No amount of scrubbing and cleaning with warm water will do it. Cans which are kept at some distance from the house cannot be properly cleaned, because the water will lose too much heat in being carried so far.

An English Dairy Test.

At the annual show of the Tring Agricultural Society, August 1st, a milking test was conducted, in which were two classes—one for cows, and one for cows exceeding 900 pounds live weight, and one for cows exceeding 900 pounds; judged by scale of points in each class. In the former the first prize was won by Lord Braybrooke's Jersey cow, Vervaine III.; weight, 854 pounds; 104 days in milk; yield of milk in one day, 43 pounds 10 ounces; of butter, 2 pounds 15½ ounces; butter ratio, 14.61. The second prize went to the same owner, for Silver Cloud 3rd, a Jersey weighing 806 pounds; 73 days in milk; yield of milk, 51 pounds 2 ounces; of butter, 2 pounds 10½ ounces; butter ratio, 19.24. In the class for cows any breed, over 900 pounds weight, the first prize went to Dr. Watney's Jersey cow, Lady of the Sunny Isles; 930 pounds weight; 114 days in milk; yield of milk, 48 pounds; of butter, 2 pounds 9½ ounces; butter ratio, 18.30. The second prize to the same exhibitor's Sheila of Ruthven; 1,037 pounds weight; 115