

# DAIRY.

## Operations of a First-rate Canadian Cheese Factory.

Cheesemaking, as conducted at first-class Canadian factories, is no longer a haphazard operation, but is conducted along scientific lines, which give the intelligent and experienced maker power to control his work in every stage. To do this only sweet, good-flavored milk must be used, and a good maker will not accept that which is otherwise, if he can detect a faulty condition. Sometimes, however, milk a little off will slip in, especially if well cooled down, and will not develop the bad flavor till heat is applied. The Tavistock (Oxford Co., Ont.) factory, owned by Ballantyne & Bell, and operated under the supervision of Mr. A. T. Bell, has a reputation to be envied for the excellence of the product turned out. The cheesemaker for this and last season is Mr. Moses Knechtel, who appears thoroughly versed in every detail of the work entrusted to him and his three careful helpers. The factory has 140 patrons (many of whom send small quantities), who together sent on August 19th, the day of our visit, 17,900 pounds of milk. This is an average day's weight, and is generally received in good condition. The troubles that have been most general this season, and for which milk has had to be returned, have been the presence of the "cowy" odor. This is only found in milk from careless patrons, and generally at such times as harvesting or other pressing work causes the proper care of the milk to be neglected. The best class of patrons never allow anything to prevent giving the milk the proper attention, which is to aerate it by dipping or pouring in a sweet atmosphere before it is cooled, directly after milking. Cooling without airing is bad practice, and serves to incorporate flavors that give trouble in the curds, and are indeed difficult to eradicate even by very careful special handling. Whenever tainted milk is returned a printed circular is sent along with it, pointing out the importance of having the milk in good condition in order to make good cheese, and also telling how to accomplish that end. The main points are: 1st, the proper washing and scalding the pails, dishes, cans, strainers, etc., scouring them once a week with salt, and not wiping them after scalding; 2nd, cleanliness in milking; and 3rd, aeration and cooling of the milk, and the importance of keeping it out of cellars and other places where taints may exist. The great trouble with patrons who have their milk returned is not a lack of knowledge in caring for it, but usually they possess liberal views as to what is termed cleanliness, or are indifferent to the welfare of the factory and its patrons, and the only way to deal with some of them is to reject their milk.

### HEATING AND SETTING THE MILK AND CUTTING THE CURD, ETC.

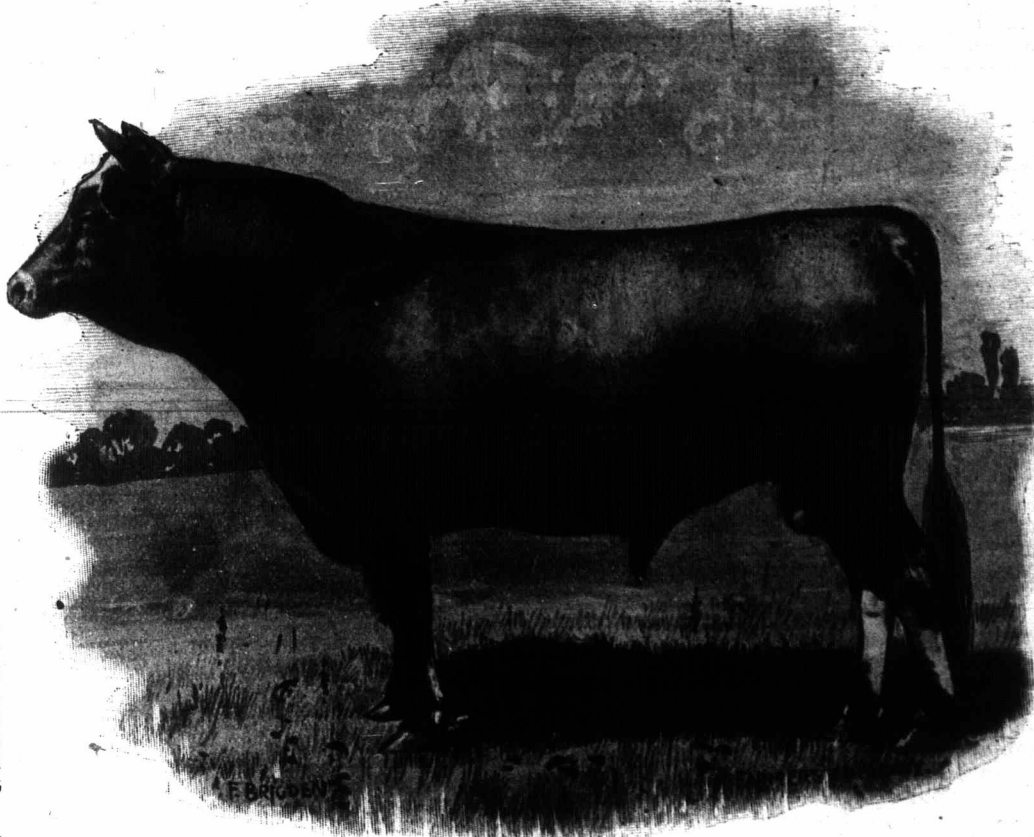
The milk is usually all in the vats by 9 o'clock in the morning. At this season four vats are used; these are each 15 feet long and 44 inches wide. They are each surrounded by a jacket for the reception of water, into which steam is turned. The milk is first slowly heated up to 86° F., two pairs of agitating paddles running during the heating. The milk is tested for ripeness by the rennet test, and it is usually necessary to add a starter in order to have the vats ripen uniformly. When the rennet test shows coagulation in 17½ seconds the vats are set. The starter is made by placing four pails of milk from the best flavored vat, if there is any difference, in a milk can. To this is added two pails of water and one and a half quarts of ripe or sour starter from the previous day's preparation. The quantity added to each vat is usually about one and a half pails, but this is guided by the rennet test.

The milk is set by adding four ounces of rennet, diluted to a good volume with water per 1,000 pounds of milk, and the agitators are allowed to run for three or four minutes. In case of overripe milk it is set at lower temperature, and as high as two ounces more rennet per 1,000 pounds of milk is added, and the vat is heated up more quickly, so as to keep ahead of the acid. The curd is cut when it splits clean over the finger pushed beneath the surface and gently lifted. This is about thirty minutes after setting. The horizontal knife is first used lengthwise of the vat, and the perpendicular knife crosswise and lengthwise, which cuts the curd into cubes about half an inch through. Care is taken not to break or crush the curd. Four pairs of paddles in each vat are now started, the curd is loosened from the sides of the vat, and steam is turned on below to cook the curd. The temperature is raised from 86 to 98 degrees in from 40 to 45 minutes. The agitators are kept running till the curd shows acid on the hot iron, and the whey is run

off when it shows from one-eighth to one-quarter inch. This is usually three hours after setting. In case of fast-working curds from overripe milk the curd is cut finer. The whey is mostly run off very soon after cutting and the curd is kept moving with the rake. In cases of bad flavors at this stage Mr. Knechtel has found advantage from washing the curd in the vat, being careful in either case not to have too much moisture in the sink. After the whey is run off, the curds are placed in the sink till they mat, then cut into blocks and frequently turned till ready to mill, in from one and a half to two hours.

### MILLING, SALTING AND PRESSING.

The Barnard curd mill is used, which is run with the engine power. After milling the curds are frequently stirred from 40 to 60 minutes, when they are piled up and closely covered for 45 minutes to mellow down. This tends to help the texture and smoothness of the cheese. They are now broken up and given plenty of fresh air by frequent stirrings until the curd shows butter-fat and the temperature is down to about 82 degrees, when it is salted at the rate of two and three-quarters to three pounds of salt per 1,000 pounds of milk. Gassy or off-flavored curds get more stirring and more time in the open air. A moist curd is salted three pounds per 1,000 pounds of milk to allow for the extra salt that runs away in the dripping. Mr. Knechtel considers piling the curd, followed by plenty of stirring in the fresh air, very important, as to neglect these a soft cheese with rag holes is liable to result. It is also well to have the particles of curd well separated before adding the salt, that the salting may be uniform. The curd is stirred



IMPORTED TWO YEAR-OLD JERSEY BULL, LORD OF DENTONIA 50166, A. J. C. C.; OWNED BY W. E. H. MASSEY, EAST TORONTO, ONTARIO.

over twice during the salting and two or three times more in the 15 or 20 minutes afterwards. It is then weighed and put into the hoops, 112 pounds in each, which makes a finished cheese of about 82 pounds. They are then pressed in the gang press for 45 minutes and then bandaged carefully. The seamless cheese-cloth bandage is used, which is neatly drawn up to prevent wrinkles. Double top and bottom clothes are put on, the outer ones being removed before the cheese goes into the curing room. The cheese are then returned to the press and turned at 6 a. m. the next day. At 11 o'clock they are taken out of the press and stamped with the number of the vat in which they were made, the date of making, and "Canada," and placed on the shelves of the curing home.

### THE CURING ROOM

is a large, airy building with fairly good light. As soon as one enters it there is noticed a peculiarly pleasant, nutty flavor or odor, which is common to good cheese. This is also recognized in the factory, and is accounted for by the scrupulous cleanliness in which the factory is kept. The curing room is kept at a temperature of from 60 to 70 degrees Fahr. In extremely hot weather the ice box is used. This is 6½ feet high, 3 feet wide, and 3 feet across. It stands on the floor and is filled with ice. It has an opening at the bottom from which the cool air circulates. The room is kept warm in cold weather by a coal furnace, jacketed with asbestos so that the heat escapes only from the top near the ceiling. All the windows of the curing room are thrown open about sunset and closed early in the morning during the warm weather. The cheese remains at the factory from three to six weeks, when it is shipped by Messrs. Ballantyne, of Stratford, who inspect it and give instructions as to time and place to ship.

### BOXING.

The cheese are weighed as taken from the shelves and placed in strong boxes made to fit the cheese snugly. Double scale-boards are put on top and bottom; the lids fit well and are put on without nailing; the weight of cheese is stamped on the outside of box, as well as the factory brand used by Messrs. Ballantyne & Bell.

### PER CENT. OF FAT, PLUS 2%. THE BASIS OF VALUE.

The patrons are paid by the quality of the milk as indicated by the Babcock test, to which is added two per cent., this being considered to indicate its cheese-producing value. The test is made once a month. An ounce sample of each patron's milk is taken each morning as received and placed in a jar containing a little more bichromate of potash and corrosive sublimate than will lie on a ten-cent piece. This keeps it in liquid form until the end of the month, when the test is made. The patrons receive monthly statements showing the pounds of milk, per cent. of fat with 2% added, pounds of fat with 2% added, average lbs. of milk to lbs. of cheese, average price of cheese, rate to patrons per lb. fat, patrons' total proportion, cheese to patrons, cash to patrons, and balance due patrons, which is paid by cheque. Mr. Bell receives \$1.85 per 100 lbs. of cheese made, and the whey, which latter is fed at the factory. For this the milk is drawn, the cheese is made, insured and sold. Last year 140 tons of cheese was made at this factory, but it is not expected much over 120 tons will be reached this season. Last fall a butter plant was put in and butter made from Nov. 1st to May 1st. The butter was made for 3½ cents per pound. This was eminently satisfactory and many patrons regretted the commencement of cheesemaking, as they prized the skimmed milk which was returned to them.

### THE HOGS THAT GET THE WHEY.

As stated above, all the whey is fed at the factory, so that the cause of so much trouble in many factories—sending home sour whey in the cans, thus tainting the next day's milk—is totally avoided. At the time of our visit about 400 hogs were being fed, most of which were of the bacon type, and about a double-deck carload were ready to ship. They are of all colors in which pigs grow, and showed Berkshire, Tamworth, Yorkshire, Poland-China, and Chester White breed type. They are a thrifty lot and were being economically fed. They receive three drinks daily of sweet whey and two feeds of pea chop and bran, from 1 to 2 of a pound to each pig at each feed, mixed in the proportion of a ton of pea chop to 1 of a ton of bran. This is soaked in whey three hours before feeding and is found to be the most satisfactory grain food obtainable. They are kept in airy pens about 10 x 10 feet, and eight or nine pigs in a pen. The pigery, which is situated some 600 or 700 feet north-east of the factory, is kept clean and comfortable. Whenever a pig goes off his appetite or shows any indisposition he is turned outdoors for a day or two, which usually puts him right. They are grouped according to color, size and form, and when ever a lot tends to get too thick and fat they are turned out into the yard and their grain ration reduced. In this way the bacon form is adhered to and the proverbial "strip of lean" secured, the pigs going off when about 8 months old at about 200 pounds each.

### THE INSTITUTION AS A WHOLE

is exceedingly well equipped, and conducted in a manner worthy of emulation. There is little, if anything, unnecessary in any department, but what is needed is present and in good form. We were informed that the price received for the output of this factory is usually from one-eighth to a quarter of a cent above the market price, and that because of the uniformly high quality of the cheese. We saw bored a number of cheese of the same dates, and of different dates, and the uniformity of those of the same age was remarkably pronounced. The ripe cheese possessed a mellowness or silkiness and sweetness of flavor that one seldom gets even on the best Canadian or U. S. hotel tables. It is a fact to be lamented, that what is true of this factory does not characterize all our cheese factories, when it could be done if patrons and makers would together strive after this high ideal. There is always an open and lively market, especially for food products of the highest quality, but the lower grades are seriously handicapped by the enormity of competition with which they meet. No doubt the character of every factory is largely governed by its sort of management, which gives the Tavistock factory a lead over most others, as Mr. A. T. Bell is recognized as being one of the foremost in the cheesemaking industry. For several years he served as cheesemaking instructor in the Guelph Dairy School, where he made a host of warm friends among the students at that institution.