

butter in a room partitioned from the separating room, and all creameries with any pretensions to first-classness will be so built. It ought to be possible to keep this room at a temperature not higher than 60 degrees to 65 degrees Fahr. Creameries that find this impossible, and that are in need of a cold storage room, will find it advisable to install an ammonia compressor, rather than to put up ice, as the former system makes it possible to control the temperature in the butter room, while the latter does not.

**Salting.**—When the butter has been properly washed it should be allowed to stand 20 to 30 minutes to drain. The amount of salt will be gauged entirely by the requirements of the market. It is hardly necessary to say use good salt, as Canadian creameries always do this. Where the butter is made in a trunk churn and worked on (or in) a separate worker, the butter will be weighed before working and salted accordingly; but when it is salted in the churn, or when a combined churn and worker is used, the weight of salt should be calculated from the weight of milk and not from the cream. It is very necessary that the salting be *uniformly* done, especially for our export trade. The writer is in favor of salting butter in the churn. First sift on a portion of the salt, then tilt the churn and sift on some more, till all is put on. Then fork it over gently until well mixed, using a wooden fork made for the purpose; after which the butter should be allowed to stand to take salt about three to four hours, either in the churn or in entry to cold storage, as may be most suitable. This system insures a more uniform color, and less working is necessary. About one-eighth ounce more salt should be used per pound of butter than when salted on the table and worked at once.

**Working.**—When butter is worked only once, and this immediately after being salted, the work should be carefully done. All small pieces of butter should be incorporated into the mass from the beginning, and not left lying around the edges and center of the worker. It is best to work by number of revolutions of the worker, and to find out the proper number by careful examination of the product after standing for 24 to 48 hours. If underworked it will be streaked; if overworked, greasy, showing injured texture. If the butter is salted in the churn, and held for three to four hours at a suitable temperature, once working will give as great satisfaction as twice under any other system. We think, however, that for the export trade, and a revolving table worker, that butter is better twice worked.

When using a combined churn and worker every care should be taken to have cream at as low a churning temperature as is found advisable, and to wash with cold water, otherwise the butter will not drain well, nor will it work satisfactorily. Not only so, but as the butter has to be salted in the churn, a uniform salting will be difficult to obtain. We find in actual practice that it is not more difficult to make an A1 creamery butter by the combined churn and worker than by the trunk churn, either in texture or uniformity of color. We have recently shipped to some prominent exporters sample boxes of butter made from same lot of cream, but churned in trunk and combined churns respectively, and the scores received for the six lots submitted were practically the same.

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#### Butter and Cheese.

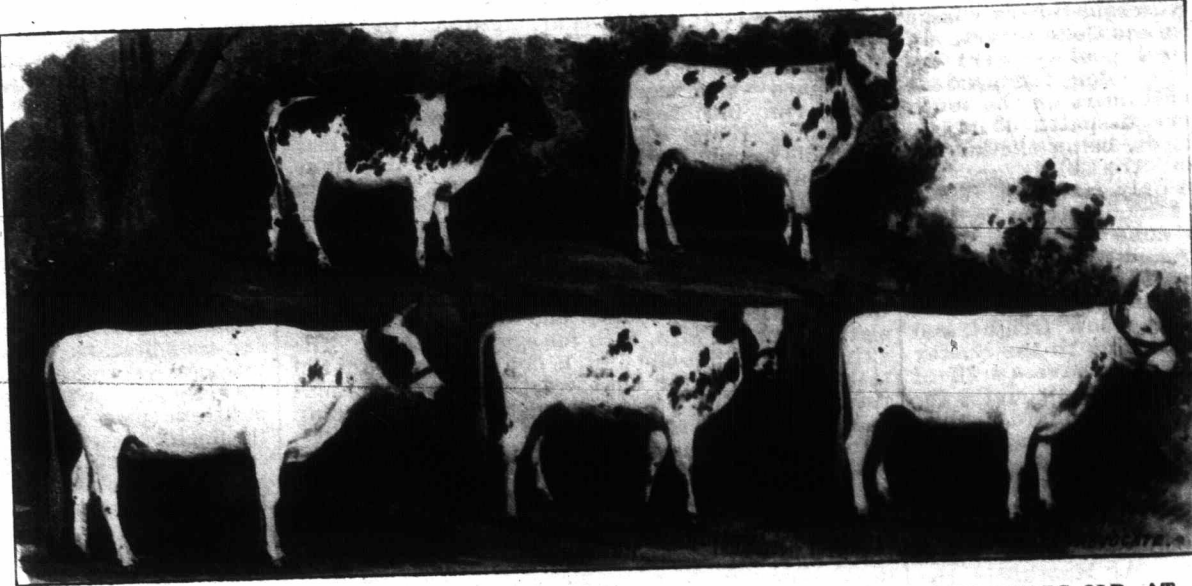
The past month has witnessed a remarkable movement of cheese and butter to the United Kingdom. For October, Canadian exports of butter to Great Britain were 42,849 cwts., as against 22,154 cwts. the same month in the previous year. Large as this increase is, it is unimportant when compared with the phenomenal increase in cheese exports. In the case of butter, this increase has been sufficient to bring the total movement of the year up to a point much in excess of that of previous years, viz., 115,182 cwts., as against 92,968 cwts. in 1897, and 69,351 cwts. in 1896. The butter demand in Great Britain has been very good, and of late shipments of butter from France have been smaller than usual, and other sources of supply have been drawn upon. The weather in Argentina has been very unfavorable to the production of butter, while currency difficulties have also stood in the way of export trade from this country. The total cheese shipments for the nine months ending 31st October are less than the same months ending 31st October 1897, being 1,179,769 cwts., as against 1,218,166 cwts. to the same date in 1897. The movement in this last

year was exceptionally large, however, as only 886,669 cwts. were sent to date in 1896. The total imports of cheese in the United Kingdom during the present year have been less than those of the past year.—*Monetary Times*.

#### Effect of Oil Cake on Butter.

With the purpose of discovering something about the effect of oil cakes on butter, experiments were undertaken last season by the Agricultural College, Wye, Eng., on behalf of the Board of Agriculture. The following are the conclusions summed up from the experiment:

1. The cows fed on cotton-seed oil cake produce milk the butter-fat of which gives cotton-seed oil reactions.
2. The reactions appear when the cows receive only small quantities of cake. They increase somewhat with continuous feeding, but apparently cannot be carried beyond a certain point, even when the amount of cake is increased to the full limit which cows, under ordinary circumstances, care to eat.
3. Reacting substances pass into the milk within less than twenty-four hours after the cake-feeding begins, and continue to do so for several days after it has been dropped.
4. The reactions vary in intensity in individual cows, but do not, in any case, much exceed those given by one per cent. of the oil, and experiment shows that this is actually the case.
5. As feeding with cotton-seed oil cake gives butter affording analytical data tending to differ from rather than approach to those given by margarine, it appears in most cases to be possible to differentiate between the cotton-seed oil reaction, due to the feeding on cotton-seed oil cake, and that produced by any considerable admixture of margarine containing cotton-seed oil with butter.



FIRST PRIZE HERD OF AYRSHIRE, ONE BULL AND FOUR HEIFERS, UNDER TWO YEARS OLD, AT CANADA CENTRAL EXHIBITION, OTTAWA, 1898; PROPERTY OF JOSEPH YUILL & SONS, CARLETON PLACE, ONTARIO.

6. The butter from the milk of cows fed on sesame oil cake gives no sesame oil reaction, even after more than two months' continuous feeding up to as large a quantity as cows will take. Similar results have been obtained by other observers abroad.

#### Small vs. Large Cows.

Professor Brandt, of Germany, conducted three experiments with light and heavy dairy cows, each lasting four weeks, the second commencing 70 days after the close of the first, and the third a year after the beginning of the first. Thirty of the heaviest milkers in the herd were separated into lots of fifteen cows each, according to live weight. The cows were kept under similar conditions as to feed and care during the trial, none being bred after the beginning of the experiment. The average weight of the heavy cows was 1,205 lbs., and of light cows, 949 lbs. The leading conclusions from the experiments are:—

- (1) The milk of the small cows is richer in fat than that of the larger ones.
- (2) Large cows eat a greater amount of feed than small cows; per 1,000 lbs. live weight, they eat less.
- (3) Small cows produce less milk than large cows, absolutely and relatively.
- (4) When in thin flesh, small cows may produce more per 1,000 lbs. live weight than large cows.
- (5) Large farrow cows are more persistent milkers; on the other hand, small cows show a greater tendency to fatten on the same feed, with a decrease in the milk flow.
- (6) The loss in selling ten of the large cows amounted to five guilder per head on the average, after having been kept nearly a year, while the loss of ten small cows was twelve guilder per head.

## GARDEN AND ORCHARD.

### Mulching as it Enables Plants to Escape Frost.

It is a general opinion that a heavy cover placed upon the soil about plants when the ground is frozen will retard sap flowing the following spring and thus delay the maturing of fruit. The practice, however, is often unsatisfactory, although at times much benefit has been experienced in escaping late spring frosts. Tests are reported by Prof. Bailey in his work, "The Principles of Fruit-growing," to have been conducted at Ithaca, N. Y., some years ago, which we deem wise to rehearse. The ground froze deep in December and the frost did not leave it until the middle of March. Upon the 28th of February, the snow being well settled and a foot deep in the open fields, heavy mulches of coarse manure and litter from horse stables were placed about apples, almonds, blackberries, raspberries, currants, gooseberries, grapes, etc., and strawberries were mulched later. The apple and other tree fruits were quite young, having been set out some four or five years. A deep covering was placed about each tree, some three feet or more in all directions. The small fruits were mulched heavily to the middle of the rows. A heavy wagon load of mulch was sufficient to cover about ten feet of the row four feet wide. On the 29th of March the mulches were examined, and although the frost had left the fields fully ten days before, the earth under the cover was still solidly frozen, and from six to eight inches of snow persisted. On the 13th of April there was still frost and snow under the gooseberry mulches, and yet both mulched and unmulched plants seemed to be starting alike. It was apparent that the temperature of the soil exerted no influence upon the swelling of the buds, for the buds which projected above the mulch were as forward as those upon untreated plants, while the buds that were under the mulch upon the same twig were wholly dormant. Moreover, the protruding portions of the mulched plants maintained their forwardness and produced leaves, flowers and fruit at the same time as the contiguous plants which were not treated. Crandall currants, Juneberries, roses, grapes, and all the tree fruits behaved similarly throughout the season. The mulched blackberries, raspberries and Victoria currants seemed to be a day or two behind the others in starting, but they very soon caught up, and there was no difference in season of bloom and maturity of fruit.

With the strawberries the case was far different. General Putnam and Oregon Everbearing were mulched March 25, when the ground was com-

pletely thawed out. The mulch covered the plants and the entire space between the rows to the depth of three inches. On the 15th of May this mulch was removed. At this time the unmulched plants were in full leaf and were nearly ready to bloom. The plants under the mulch were just starting into leaf and the growth was weak and bleached. The mulch was forked off the plants and they gradually assumed a normal color and habit, and bloomed June 1st. The bloom was delayed from ten days to two weeks, according to the depth of covering. The plants did not seem to recover entirely, however, and the fruitage was somewhat lighter than on the normal plants, but it was delayed a week.

These results are not at all unexpected to the botanist, as it is well known that plants store up starchy matters in their bulbs or branches to be used in the growth of the adjacent parts in the early spring. The earliest bloom of spring is supported by this store of nutriment, rather than by food freshly appropriated from the soil. This is well illustrated by placing well-matured twigs of apple or willow in vases of water in winter, when the buds will burst and flowers will often appear.

These experiments and observations show that a mulch can retard flowers and fruit only when it covers the top of the plant as well as the soil. It is evident, too, that the covering of strawberries and other low plants, for the purpose of retarding fruit, must be practiced with caution, for a mulch of sufficient depth to measurably delay vegetation is apt to bleach and injure the young growth and to lessen the crop. Yet it can be sometimes used to good effect and fruiting can be delayed a week, perhaps even more. We must bear in mind, however, that there is danger of injuring plants by heavy mulch which is allowed to remain late in spring. If it is desired to retard flowers or fruit by mulching, the practice should not be violent and the plants should be carefully watched. We must also conclude that the practice of some orchardists in mulching to delay blooming of apple trees till danger of spring frosts are past is of little advantage.