

4. Don't expect it to do more than the maker intended it to do.

5. In making your selection, buy one with good heavy castings and strong wheel, with long anti-friction babbit metal bearings; they are the best (ninety-five per cent. of the world's best machinery is run on such bearings).

6. Take good care of it. Oil it often; tighten up all nuts occasionally; keep the bolts tight and your machinery in good condition, and you will prove by experience that a windmill is the cheapest, simplest and most useful piece of machinery on the farm.

Brandon.

H. CATER.

In no branch of the manufacture of agricultural implements has there been a more marked advance than in the production of efficient labor-saving machinery for cutting and saving the hay crop. Leading Canadian and American firms, whose announcements appear in the "Farmer's Advocate," have produced machinery of the very greatest service to farmers in these days of big crops, and, in many cases, an insufficient supply of help. Our readers would do well to see that haying equipment is complete and in good working order.

### DAIRY

The breed and individuality of the cow largely determines the quality of her product and the quantity of production from a unit of food. Neither heavy feeding nor skill in compounding rations can be made the means of causing her to overstep her constitutional limitations.—[Jordan.]

It must always be remembered that the true value of a dairy cow does not lie in having a nice square vessel and well-set teats (though these add to her general appearance), but in the amount of milk and butter she is individually capable of producing in a year, and the only way to ascertain this is by means of the spring balance and butter-fat tester.—[Robb.]

Since it costs about \$12.50 per cow to pay for the work connected with milking, and from \$7 to \$8 to raise the calf on skim milk, a cow must produce, in order to be profitable, at least \$20 worth of butter-fat before it will pay to milk her, assuming that the skim milk pays for hauling. With four per cent. milk and 15 cents for butter-fat, this would mean 3,333 pounds of milk per annum; with 18-cent. butter-fat it would be 2,777 pounds of milk per annum, and with 20-cent. butter-fat it would be 2,500 pounds of milk. This is assuming that a dairy cow would eat no more when giving milk than she would when not. Doubtless she would eat some more, and this would have to be added to the above cost.—[Kansas Bulletin, 125.]

The texture of butter depends upon the state of the granular condition of the fats. When the butter is first formed in the churn it makes its appearance in the shape of minute, irregular granules. In the subsequent process of manufacture these granules never completely lose their individuality, and constitute the so-called grain of the butter. The more distinctively the individuality of these granules is marked in the mass of butter, the better the texture. The texture of the butter is shown by an appearance like broken cast iron when a mass of butter is broken in two transversely, and when a metal is passed through the butter, as a knife or trier, if the butter be of the best texture, no particles of fat adhere to it. The texture of the butter is deteriorated if the particles of butter are churned in too large masses, and in the process of working the individual particles are made to move upon one another at too high a temperature. The mere warming of the butter to a point approaching the melting point destroys the grain upon subsequent cooling, even though the mass of butter may have been undisturbed.—[Wing.]

If the cream is thoroughly and uniformly ripened, the separation will be more uniform and the churning more complete than when creams of different degrees of ripeness are churned together, but under various conditions, and from time to time, the completeness of separation varies with the size of the granules of butter; that is to say, if the granules have reached a certain size, it does not always follow that the fat has been removed from the buttermilk to the same degree, so that the size of granules of butter is not a certain indication of the completeness of churning. When the churning process is complete the buttermilk takes on a thin, bluish, watery appearance, quite distinct from the thicker creamy appearance of the unchurned cream, and the churning should be continued until this condition of the buttermilk is reached, even though the granules are increased in size beyond the point favorable to their best separation from the buttermilk. The higher the temperature at which the cream is churned, the greater the percentage of fat left in the buttermilk and the more granular the butter incorporated with the butter.—[W.]

### Cheese and Butter Grading Standards.

Until further notice the official referee for butter and cheese will observe the following standards and classification in giving certificates as to the quality of cheese and creamery butter which he is asked to examine:

#### CHEESE.

##### First Grade.

Flavor.—Clean, sound and pure.

Body and Texture.—Close, firm and silky.

Color.—Good and uniform.

Finish.—Fairly even in size, smoothly finished, sound and clean surfaces, straight and square.

Boxes.—Strong, clean, well made and nailed. Ends to be of seasoned timber. Close fitting. Weights stencilled or marked with rubber stamp.

##### Second Grade.

Flavor.—"Fruity," not clean, "turnipy," or other objectionable flavor.

Body and Texture.—Weak, open, loose, "acidic," too soft, too dry.

Color.—Uneven, mottled, or objectionable shade.

Finish.—Very uneven in size, showing rough corners, black mould, dirty or cracked surfaces, soft rinds.

Boxes.—Too large in diameter; top edge of box more than half an inch below the top of the cheese. Made of light material. Ends made of improperly seasoned material.

##### Third Grade.

Flavor.—Rancid, badly "off," anything inferior to second grade.

Body and Texture.—Very weak, very open, showing pinholes or porous, very "acidic," very soft or very dry.

Color.—Badly mottled, or very objectionable shade.

Finish.—Anything worse than second grade.

Boxes.—No question of boxes sufficient to make third grade if other qualities are good.

#### Explanations.

It would be impossible to define exactly the qualities or defects which may appear in cheese. The standards given are intended to indicate the range of quality for the different grades rather than to establish hard-and-fast rules to guide the grader.

The expression "good color" means that the color must be of a proper shade. There are cheap, inferior cheese colors used which do not give the proper shade no matter what quantity is used.

The expression "clean surfaces" in the definition for first grade does not exclude from that grade cheese with a slight growth of blue mould, although it is desirable that the cheese should not show any signs of mould. "Black mould" (see definition for second grade) is simply the advanced stage of the ordinary blue mould.

The following scale of points will indicate the relative values of the different divisions of quality: Flavor, 40; body and texture, 30; color, 15; finish and boxing, 15; = 100.

It is obvious that a defect in flavor of a certain degree counts nearly three times as much in determining the grade as a defect in finish or boxing of the same degree.

Cheese which are strictly sour, or otherwise inferior to third grade, will be designated as "culls," for which there is no classification.

Any lot of cheese shall be considered third grade if it shows three or more defects of second-grade class.

If there are not more than 15 per cent. of defective cheese in any lot, the inferior ones may be sorted out and classed separately. If more than 15 per cent. are defective, the classification for the defective cheese may apply to the whole lot.

This does not apply when inferior cheese have been properly marked so as to be identified, in which case the inferior cheese shall be treated as a separate lot.

#### CREAMERY BUTTER.

##### First Grade.

Flavor.—Sound, sweet and clean.

Body and Grain.—Waxy; not too much moisture.

Color.—Even, no streaks or mottles, not too high.

Salting.—Not too heavy if salt butter. Salt all dissolved.

Finish.—Good quality parchment paper lining, neatly arranged. Package well filled; bright, even surface.

Packages.—Well made, of good material, and clean. Boxes to be of right size to hold 56 lbs. of butter when properly filled. Paraffined on inside. Neatly branded. Tubs to be lined with parchment paper of good quality.

##### Second Grade.

Flavor.—Not quite clean, or other objectionable flavor.

Body and Grain.—Salvy; overworked; too much moisture.

Color.—Slightly mottled or streaky; too high, or objectionable shade.

Salting.—Too heavy; salt undissolved, or unevenly distributed.

Finish.—Very light or poor quality parchment paper lining; lining not arranged to protect butter; mould on parchment paper. Rough, uneven surface. Package not properly filled.

Packages.—Rough, badly made, or of poor or unseasoned material, including sapwood. Dirty packages. Uneven weights.

##### Third Grade.

Flavor.—Very stale; very strong stable flavor, or anything inferior to second grade.

Body and Grain.—Very salvy; "mushy"; mould in butter.

Color.—Very mottled or otherwise inferior to second grade in regard to color.

Salting.—No question of salt alone sufficient to make third grade if other qualities are up to first grade.

Finish.—No parchment lining. Very rough finish. Dirty surface.

Packages.—Inferior to second grade.

#### Explanations.

It is difficult to explain exactly the qualities or defects which may appear in butter. The standards which have been adopted are intended to indicate the range of quality for the different grades, rather than to establish hard-and-fast rules for the guidance of the grader.

"Fresh" or saltless butter will be judged on the same standards as for salted butter, by leaving the matter of salting out of the consideration.

A package is not considered well filled if the butter is more than half an inch below the top of the package.

It is very important that all boxes should hold only 56 lbs. No other weight should be marked thereon. Tubs should be of uniform size and weight.

The following scale of points will indicate the relative values of the different divisions of quality: Flavor, 40; body or grain, 25; color, 16; salting, 10; finish and packing, 15; = 100. It is obvious that a defect in flavor of a certain degree counts nearly three times as much in determining the grade as a defect in finish or packing of the same degree; and so on.

The expression "too much moisture," applies to all butter which contains over the legal limit of 16 per cent. of water, or to any butter that, according to the custom of the trade, would be described as containing too much water. (From many tests made, finest Canadian butter does not contain, or should not contain, on the average, over 13 per cent. of water.) The official referee will not be expected to determine the actual percentage of water.

"Too heavy salt" means more salt than is generally demanded by the trade for salted butter.

"Too high color" means over-colored, or too much coloring material used. "Objectionable shades" or unnatural colors are those which result from the use of inferior or unsuitable coloring material.

J. A. RUDDICK,

Ottawa, May, 1905. Dairy Commissioner.

### Co-operation in British Dairying.

The great drawback to success in dairy co-operation is the lack of cohesion among farmers. They will not stand in and help one another. The big drop in milk prices, both north and south, this year, has made some listen who formerly were deaf to the cry of the co-operator. It is calculated that the drop of one penny per barn gallon in Staffordshire this season means a loss of something like £24,000 to the members of the Farmers' Association in that county. This drop could, in the opinion of those who have studied the question, have been prevented, had the Association had central factories to fall back upon. It is suggested that such factories could be established at a cost of £1,500 each, and were such in constant operation the price of milk would be sustained at a uniform level. During seasons of scarcity, following on a big demand, the factories would distribute the milk whole; during seasons like the present, the milk supply would be restricted and cheese made with the overplus, so that prices would be equalized. All this looks well on paper, and some are sanguinary enough to suppose that, in addition to getting a steadily uniform price for their milk, those who were members of such factory companies would be getting five per cent. interest on capital. These things have been said before, but the results have not come up to expectations. The principal thing to be aimed at in the factory system is the equalizing of prices through making the producer more or less independent of market fluctuations. Without such a back-door it is impossible for any farmer's agent to conserve the interests of his clients as they ought to be conserved, and a Dairy Farmers' Federation is not of much use unless it helps the producer in a season like the present. It is calculated that a drop of one penny per barn gallon in the price of milk supplied by one English affiliated association means a loss of £150,000 per annum. By organization and co-operation with a system of factories, the greater part of this loss could have been prevented.—[Scottish Farmer.]

### Australian Butter for England.

Acting on the recommendation of Mr. Swinburne, Victorian Minister of Agriculture, the Export Freight Committee, appointed by the butter-shippers, has concluded a contract with the White Star, Aberdeen and Lund lines for the carriage of butter to England. The freight rate will be 3d. per pound, and the duration of contract is to be three years, and subject to a year's notice. A weekly sailing is guaranteed during the season. The present freight rate is 1d. per pound. Last season's output of butter was 12,000 tons, and the freight paid to the P. and O. and Orient companies amounted to £84,000.