

last year." He has an excellent face and horn. If he has a lack it is on the rib and quarters, but even with these slight defects none of the others, male or female, could touch him; hence he easily carried off the president's medal.

Although much obscurity hangs over the origin and early history of this breed, it is highly probable that they are the descendants of the cattle of the ancient Britons. They now occupy in a general way the whole of the West and Middle Highlands and the Western Islands, although Argyshire is considered to be their central home. Until quite recently very little attention has been given to their improvement, but now a herd book is established, and the success attending their improvement is encouraging to their promoters.

They have a striking appearance, especially when their flowing coats are at their best. They are extremely hardy, vigorous, quick and active, being peculiarly adapted to their inclement and rugged home. They are celebrated for their grazing properties, being contented with the coarsest fare, and ultimately get fat where more tender breeds could scarcely exist. In winter they frequently eat heather and furze, and when taken south flourish on pasture from which the best portions have been eaten. Their meat, which is of fine quality and well laid on, is highly prized in the English markets.

Their dairy qualities have not been given much attention, although they usually give sufficient milk to promote rapid growth in their calves. After weaning, slow growth and maturing has been the rule because of the nature of their environments; but since more care has been given them their maturity is being more quickly reached.

There have been a few importations of Highland cattle made into Canada, some of which found their way to Manitoba and the Northwest, but they have never been sufficiently tried to enable their adaptability to our conditions to be thoroughly tested. Their extreme hardiness and strength of constitution should adapt them to cold, mountainous districts.

DAIRY.

The British Butter Market.

TIMELY SUGGESTIONS.

The Journal of the Royal Agricultural Society, of England, contains an article of much worth, dealing with the condition of dairy produce imported into the United Kingdom, and also offers some suggestions as to how improvements can be made in the preparation and shipping of butter and cheese.

The predominating feature of the season of 1894-95 is the extremely low range of prices which throughout has characterized the market for butter of all descriptions, and never since the Australian Colonies began to supply British markets with dairy produce have such abnormally low values prevailed. This remarkable fall is due to several causes. Perhaps the one nearest home is the fact that all over Europe and the British Isles the 1894 crop of grass, hay and other fodders was enormous. Another cause likely to have weighed down the prices was the increased supplies sent in from the Colonies. The total import in 1894 was 32,430 tons more than in 1889, and of this increase Australia and New Zealand contributed a little less than half. In the season of 1894-95 the increase import over 1893-94 was from Denmark, France, Sweden, and Holland, 7,290 tons, but from the Colonies only 2,010 tons. Therefore it must be concluded that the increased supply of the four European countries mentioned had much to do with the fall in values.

While it seems reasonable to suppose that every important English port would furnish a market, it is advised by the Journal of the Agricultural Society that to ship butter direct by steamer to such ports as Manchester, Bristol, and Glasgow would probably prove an extremely hazardous experiment, unless such parcels were sold before arrival. Up to the present time London has been the chief distributing centre. Railway and shipping facilities are much greater from London than from any other place, and a much larger quantity of butter than now arrives could easily be distributed from London without any resultant depreciation in price. Before direct shipments are sent to any provincial centre the exact color, flavor, saltiness, etc., of the butter consumed in that district must be ascertained and the consignment prepared accordingly, or disaster will follow.

Heretofore the European countries have had a decided advantage over the Colonies, inasmuch as they ship butter the year round, thus keeping a constant supply before the consumers who have found it to suit their particular liking. When the Colonial butter arrives at the commencement of each season it has to displace other varieties before it can find a market for itself. People become accustomed to a particular flavor by long usage, consequently those butters that are on the market permanently secure a firm position in public favor, while those which appear only during a certain season have great difficulty in obtaining a full recognition of their good qualities except by some sacrifice in price.

Preparation for British Markets. The packing of butter is now nearly perfect, so far as the condition on arrival is concerned, though on the ground of economy it would be a great advantage if lighter

boxes could be safely used. In many instances, if better vegetable parchment were used there would be no room for any complaint. It is very detrimental to the best interests of the trade for short weights, or uneven weights, to be sent to the British market. There must be 56 lbs. full weight in every box when it arrives, and to secure this at least 56½ lbs. should be originally packed in the Colonies. Besides this, it is well to soak the inside of the boxes with a strong brine just before packing the butter into them.

The color of butter suitable to different districts in the United Kingdom varies according to locality. In the Manchester district, and many other northern centres, a very pale, natural cream tint is preferred, while in South Wales and other districts a deep yellow is considered best. Up to the present no butter from the Colonies has been light enough in color to compete successfully with either the best Danish or Swedish, such as is eaten in the Midlands and North of England.

There is a change needed in the saltiness of butter sent into England, as the public taste is growing in favor of fresher butters. It would be well to reduce the amount of salt until 1½ or 2 per cent. were reached.

It is essential for a brand of butter to find a good market that it should be reliable as to uniformity in all its qualities. Color, flavor, texture, etc., should never vary. Some brands have already secured a good reputation for this, and are more sought after by buyers in consequence. When four or five different qualities of butter are found existing under one brand, it requires very little commercial knowledge to discern that this must mitigate against fetching as good a price as it would if the quality were uniform.

Butter-shipping Colonies have all been asking themselves how they can compete successfully with the Dane in the struggle for British markets. "Can we out our Continental competitors and supply all the butter Great Britain needs?"

It is not, however, simply Danish versus Colonial competition that is at present awaiting solution. The contest is between the man who can make a profit by laying his butter down in the British market at 9d. or 10d. per pound, be he Dane or Swede or Colonial, and the man who cannot do so except at a loss. In the contest for supremacy in the British market, the man who can supply the best butter at the least cost will come out triumphant, no matter in what country he resides. The Colonial dairyman, therefore, should turn his attention to the improvement of his butter and endeavor to discover the most economical conditions for its manufacture, transit and sale. It is very interesting to study at what price one's opponent can sell his goods, but it is far more useful to employ one's energy in ascertaining how you can make the best article at the least possible cost.

The Thistle Milking Machine Tested in Canada.

SIR.—When the Hon. Thomas Ballantyne, of Stratford, was in Scotland last spring, he had an opportunity to examine carefully what is known as the Thistle Milking Machine. He was pleased with the work which he saw the machine doing, and, being anxious that Canada should be abreast of the times in everything pertaining to the dairy industry, he suggested to the makers that they should send a machine to the Agricultural College, Guelph, to be tested and reported upon.

The machine came, was set up, and run for seven or eight days, and, in the absence of our Professor of Dairying, I beg to submit, for the information of your readers, a brief report of the results of the test, which closed on Friday, the 9th inst.

The Thistle Milking Machine was invented about four years ago by Alexander Shiels, M.B.C.M., B.Sc., of Glasgow, Scotland, and is now manufactured in the same city, 25 Gateside street, by The Thistle Mechanical Milking Machine Co.

The machine has been tested by a number of competent judges in different places, and is now being used by some of the most prominent Scotch dairymen, including Thomas Kerr, Kirkcudbright, who has a herd of 80 cows; Robt. Wallace, Mauchline, 40 cows; and Mr. McBride, Garroch Tree, Stranreer, 100 cows. One was put up a short time ago for D. H. Burrell & Co., Little Falls, N.Y. And, I believe, the only one in Canada is that which has lately been at work in our dairy stable.

The company makes a hand-machine to milk four cows at once, and a three-horse-power machine to milk ten. I have not seen the hand-machine, but we have tested the power machine, and I have no hesitation in saying that it does its work very satisfactorily.

The machine is a large air-pump of special and peculiar construction, of good quality, strong, substantial, and well made. It is set on a concrete foundation, made of gravel, cobblestones, and Portland cement, 3 ft. 3 in. by 4 ft. and 2 ft. deep, outside of our dairy stable, close to the wall of the building and a short distance from a row of 15 cows, opposite which there is another row of the same number of cows, with a feed passage between. A copper suction-pipe passes from the pump through the wall into the stable and overhead to the passage between the two rows of cows. From this main tube two smaller copper tubes are carried along on top of the stall divisions, one above the necks of each row of cows; and in each stall, at the side of each cow, there is an opening in this cross tube, from which a short piece of smaller copper

tube points downwards, slanting towards the passage behind the cows. This smaller piece of tube in each stall is controlled by a stopcock; and to it a rubber tube is attached when milking begins. This movable rubber tube extends down to a heavy, broad-bottomed tin pail on the floor, and another rubber tube connects the pail with the teat-cups which are attached to the udder.

For milking ten cows, ten pails and ten sets of teat-cups are used—five for each row of cows, so as to keep the two suction tubes in front of the two rows of cows working at the same time. It, of course, takes less time to milk some cows than others; so, when a cow is milked, the man in charge shuts the stopcock, detaches the rubber tube, empties the pail into a large milk can standing close by, removes the apparatus (the rubber tube, pail, and teat-cups) to another stall, and places them in position to milk another cow. In this way he keeps on moving the pails from stall to stall, one at a time, till all the cows in his row are milked. Another man or boy does the same thing in the opposite row. It is not necessary, however, to milk both rows of cows at once. The ten pails might all be used on one side, in which case one man, or a man and a boy, could attend to them and keep his eye on the working of the pump.

As stated above, the milk pail is heavy, broad, and low, so that it is difficult to upset. The cover is soldered on and the milk enters through a short and strong glass bottle, which is inserted like a cork into the lid at one side, resembling a bottomless quart fruit jar, but only about half the length. By observing the glass bottle, one can see how the milk is flowing from the udder and know when to stop milking.

Owing to the action of a reducing valve, which is used for the admission of air at regular intervals, the suction acts in a series of successive pulsations, resembling the action of the mouth of a calf in sucking or the hand in milking, and varying in the proportion of 15 to 5. As the suction increases, the teat-cup contracts first at the top and then gradually downwards to the bottom, forcing the milk out of the teat; and when it reaches the maximum of 15, air is admitted which reduces it to 5, thereby partially releasing the teat and allowing it to fill with milk again. In this way the milking is done naturally, quickly, thoroughly, and without any annoyance to the cow. The machine operates more regularly than the hand. Hence, it is likely to produce better results, and it makes it next to impossible for any kind of dust or dirt to get into the milk during the process of milking.

We used our portable farm engine in making the test; and we found that a man and a boy could milk 26 cows in from 20 to 25 minutes. I think it might be arranged so that one man could milk nearly as many in the same time.

We weighed and tested the milk from each cow as usual and found about the same quantity as was obtained by hand, but a marked fall in the percentage of fat, due, we have no doubt, to the excitement caused by the noise of the machine and the presence of a large number of people in the stable. As the cows became accustomed to the noise, the percentage of fat gradually increased.

I have had no communication with any member of the firm, and have no interest to serve in recommending the machine; but I must say that, in my judgment, the inventor deserves great credit for what he has done to remove one of the chief obstacles to successful dairying on a large scale. The only thing to prevent this machine from being extensively used is the cost of the machine and of the power necessary to run it.

JAMES MILLS.
Agricultural College, Guelph, Ont., Aug. 15, 1895.

Feeding Standards and Rations for Dairy Cows.

[Farmers' Institute address by G. E. Day, B.S.A., Professor of Agriculture and Live Stock Lecturer, O. A. C., Guelph.]
(Concluded from page 319.)

By means of many experiments, feeding standards have been compiled for different classes of stock. To German experimenters belongs the credit of first investigating the matter, and Dr. Emil Wolff, a noted German scientist, proposed the following feeding standard for dairy cows:—

A dairy cow in full milk should receive per day and per 1,000 pounds live weight:

Total organic matter.....	24 lbs.
Digestible protein.....	2.5 "
" carbohydrates.....	12.5 "
" fat.....	4 "
Total digestible nutrients.....	15.4 "
Nutritive ratio.....	1:5.4

The German standard, given above, does not correspond with the practice of American dairymen; and after obtaining the information regarding the rations fed by a great many leading dairymen in the United States and Canada, the Wisconsin Experiment Station recommends the following standard, which is known as the American standard ration for dairy cows:

Total organic matter.....	24.5 lbs.
Digestible protein.....	2.5 "
" carbohydrates.....	13.3 "
" fat.....	7 "
Total digestible nutrients.....	16.2 "
Nutritive ratio.....	1:6.9

It is highly probable that the American standard will prove more satisfactory than the German. If we wish to formulate a ration we must first