

those of their parents, but there the matter has generally rested. Half a century of weeding and selecting is not too much time for the perfection of a breed that shall possess the desirable properties, such as fair size, plump form, soft skin and hair, rich color, good quality of flesh, abundance of milk, richness of cream, high colored butter, of good quality, and plenty of it. Add to this, beauty of form, and you have a model breed, which will have a boom all the time and everywhere.

It does seem as if, in this way, an improvement might be made on any of the pure breeds of cattle.

There is no doubt much to be said in favor of keeping the existing varieties distinct, and intensifying, if possible, their peculiar characteristics, but is there no danger in pursuing such a course, of overstimulating certain organs to the neglect of others, of upsetting the healthy balance, and eventually rendering the breed *impotent* and weak; such a state of things is already foreshadowed in the *Jersey*, its precocity, its liability to milk fever and garget, the impotency of the males, and the incontinence of the females. The same may be observed in one way or another in other breeds, which have been forced to produce beef or milk exclusively. The *Holstein* may be said to be nearly perfect, but the beef is said to be of inferior quality, and the milk, though abundant, not uniformly rich in butter. It is not at all probable that the desirable properties of beef, milk, butter, size, and beauty, will be secured in perfection for a long time to come, but let some energetic young man try the experiment, and if he succeed, all generations shall call him blessed.

PROGRESS.

The thoroughbred Ayrshire Heifer, "Alpha," bred and owned by the Rev. A. C. Macdonald, Bayfield, gives promise of a very deep milking capacity. At this date, (July 14th) she has given a continuous milk flow of an average of seven quarts per day, and although within three weeks of calving, all efforts to dry her off for the past three weeks have proved unavailing. This flow exhibits over 2,500 quarts for the period named, and places to her credit 1000 quarts over the average cow. "Alpha" may be reasonably expected to exhibit a high record, as, with the good habits now formed, there is in her veins a high milking strain, both on the dam side, "Lille," and the sire side, "King of Hearts." The bull calf dropped by this cow, when she was about three years old, has just turned his first year, and, being sired by "Marmion," owned by Milford Haven Society, one of the finest animals imported into Eastern Nova Scotia, may be expected to occupy a high place in the ranks

of this fine breed. An increase of the progeny of "Alpha" and "Marmion" is now looked forward to with interest by the occupants of the Rectory, Bayfield.—*Eastern Chronicle*.

MILK PRODUCTION.

What are the sources of the ingredients of milk; It is readily admitted that the *albuminoids* of the milk must be derived from either the albuminoids of the food or from those of the animal economy; and that the albuminoids of the milk are of the same character as those found in the serum of the blood; but that caseine is not found in the fluids or tissues of the animal body, but is, rather, the special product of the milk glands. And, contrary to the general prevailing views, fat of milk is derived from albuminoids. These facts have been proven by investigation with the microscope, which reveals the fact that the formation of the fat-globules in the epithelial cells are plainly seen. These investigators have found that even carnivorous animals, on a strictly meat diet, produce natural milk, thereby showing that the fat of milk may be formed out of albuminoids, and, also, that the greatest quantity of milk is always produced in greater ratio out of foods rich in protein. It was also shown by experiments that the carbo-hydrates were consumed in the production of animal heat, and not in the production of milk-fat to any great extent.

On the other hand, both the proteins and carbo-hydrates in the food of herbivorous animals may result in the formation in the milk of *milk-sugar*.

That quantity of milk does not depend upon the quantity and quality of food exclusively, nor to so great an extent as is ordinarily supposed, but upon the development of the milk-glands; and that both quality and quantity of milk, also, greatly depend upon the physiological capability and aptitude of the epithelial cells of the vesicles of the milk-glands. For, with precisely the same food, one cow will give much and another but little milk; and that the milk of one will be rich in fat, while the milk of the other will be very poor in that ingredient; or that another will be rich in cheese or caseine, which is a product of the milk-gland, since it neither exists in the blood nor in the animal body; or that another cow, whose peculiar pre-disposition furnishes a milk better suited to a beef product. From all of these facts, it is essential to possess a cow suited for either special product desired. Neither Mr. Holly, Mr. Fuller, nor any other breeder of Jerseys could make the Jersey cow Dandehon, or Mary Ann of St. Lambert, or any other Jersey cow, superlative cheese cows, no matter how fed, nor how much food

they consumed. But these grand cows, with splendidly developed milk glands and superlative butter capabilities, will make butter out of hay, straw, oats, corn, bran, brewers' grains, ensilage, fish, fowl, beef, or mutton. All this is because their butter-yielding capabilities have been bred in-and-in, and these are the inheritances bequeathed from ancestors for generations, to yield large quantities of butter. But food, as we shall see, does yield results, according to quantity and quality, if the powers in the animals to which it is fed are of a kind and degree to transform it into suitable products.

The Ayrshire cow has an extraordinary capability to convert nitrogenous food into nitrogenous product—cheese; the *Holstein Dutch Friesian*—"what's in a name"?—cow has, also, a marvellous ability to yield quantity of milk—almost 19,000 lbs. in a single year, while the *Jersey* will make, out of the same food-equivalent a third more butter, even though the quantity of milk be half as great, and her own weight but two thirds that of either of the other cows.

It has been stated that the cells of the milk-glands are chiefly composed of protein, and the natural inference would be that food rich in this element would prove most serviceable, not only in the quantity but also in the quality of the product yielded. Still further, we have seen, that fat and a part of the milk-sugar are also derived from nitrogenous foods. In fact, it has been repeatedly demonstrated that the largest flow of milk, and the richest milk, result from fodders richest in protein. The milk from such food contains less water, and relatively more solids—butter, cheese, milk-sugar and salts. And, as it is the solid part of the milk that makes it valuable, the quantity is but a poor criterion of the quality of product obtained, though it is true that milk equally rich in solids has a value corresponding exactly to quantity. For instance: if the standard of 88 per cent. of water and 12 per cent. of solids in milk were uniform from all breeds of cows, however fed, it would be easy to estimate the quantity of produce by the weight of milk.

But it has been seen that, though 10 to 15 lbs. of Jersey milk yielded a pound of butter, it has required from 20 to 30 lbs. of the milk of some of the other breeds of cows to furnish a pound of butter. But, a liberal supply of foods, rich in albuminoids—bean-meal being the richest—not only favors great increase of the production of milk, but also keeps up the flow to a fuller extent than watery foods, poor in protein. The natural tendency is a large flow of milk after calving, which tapers down to a small yield at the seventh or eighth month of gestation, while the liberal feeding of foods rich in