

permit. As will be seen in Fig. 1, just above each teat there is a milk cistern, and from this branch out tubes which subdivide and ramify through the tissue of the udder. Along these tubes at different places are situated other smaller cisterns or reservoirs and around the base of these are congregated numerous muscular fibres, which by contraction, may intercept the flow of milk to the cistern just above the teat. These small muscles connect with those of the abdomen and it is through these that a cow is able to withhold her milk. These fine branching tubes, which become very small after a number of subdivisions, terminate in small vesicles. The lining of the latter is made up of small cells (epithelial cells) as shown in Fig. 3, and in these the principal constituents of the milk are elaborated.

To our friend the *Jersey Bulletin* we are indebted for the loan of cuts one and four; two and three we have prepared from an article in the "Encyclopedia Britannica" by Dr. Hendrick.

The constituents which it may interest us to trace to their origin are the casein, fat, and milk sugar. The fat in the milk is produced in the epithelial cells through the action of the protoplasm of the cells, and to perform this function it must be well nourished, and this is abundantly provided for by the blood, for every vesicle is surrounded by a dense network of capillaries. The fat of the milk is not according to the best authorities, derived from the fat of the food, but from the nitrogenous constituents of the food, in fact, it is asserted that too much fat in the food tends to decrease the activity of the protoplasm in the cells and hence the secretion of fat also. The casein in the milk is also a peculiar production of the protoplasm of these cells, for it has been noticed that when the cells are acting imperfectly, as in the first periods of lactation, the amount of casein in the milk is very small; but when very active, as some time after lactation has gone on, the proportion increases. The milk sugar of the milk is also a product of the action of the protoplasm in the secreting cells, an assertion which is borne out by the fact that this particular form of sugar is found in no other part of the body, though grape sugar is contained in the blood and other fluids of the body. The source of the water in the milk is undoubtedly the water in the blood, and thus the quantity of water in the milk may be greatly influenced by the state of the blood, and the latter in turn by the nature of the food fed. For instance, such foods as brewers' grains will, if fed excessively, lessen the quantity of solids and increase the proportion of water in the milk.

Over all this, however, there is a subtle guiding power that makes or mars the returns from the food. We refer to the nervous system of the animal and that part in particular known as the sympathetic nervous system, the centre of which is in a chain of nervous elements extending along just beneath the backbone. This system greatly contributes to the formation of the vaso motor nerves which are in connection with the muscular walls of the blood vessels, and may increase or decrease the calibre of the latter and so the quantity of blood that flows through them is largely controlled by the sympathetic nervous system. Not only the mammary gland but other organs may be affected through the action of this part of the nervous system. The supply of blood that goes to the mammary glands is thus largely regulated and so this system may influence the milk materially.

In our second paper we hope to draw a few logical and practical deductions from what has been written in this paper.

Horticultural.

FOR THE CANADIAN LIVE STOCK AND FARM JOURNAL.

Rose Culture for Beginners.

By the Hon. Mrs. LAMBERT

After years of experience, with their due share of success and failure, I record with confidence the result of this experience in a few plain rules, which, if implicitly followed, will make success sure to the merest amateur.

Every one commences to grow roses with the conviction that the great obstacle in the way of success is the severity of our climate, whereas it is quite possible to raise as fine roses in Canada, even as far north as the Ottawa region, as can be grown in England. In fact, our best rose collections are said to show a greater profusion and a longer season of bloom than even the famous English rose gardens. But it is perfectly useless for anyone to try to cultivate this beautiful flower unless they have a place for them where the first morning sun can shine fully upon them, and continue to do so until at least mid-day, and as much longer as possible. No amount of attention or favorable conditions will be of any use unless this first requisite is to be obtained. The next condition must be a well-drained spot, where water will not stand on the surface during the winter, for although they will endure a temperature of 40° below zero with impunity, and come out smiling and green in the spring, if they are but dry, yet if they are surrounded by ice, not one single one, of even the hardiest, will survive our most temperate winters. The third condition is a deeply worked soil—two feet deep is enough, and not too much—and the ground well enriched with cool manures and fertilizers. Nothing is better than plenty of soot, bone dust, and very old manure from the cow stable. Then, the plants must not be too near together, so that the air and light may circulate freely among them, and plant in the spring.

As to varieties, the most desirable rose in cultivation, the General Jacqueminot, is the most easily grown, and if a collection of one dozen bushes is desired as a beginning, six of them should be of that superb variety, two *Magna Charta*, two *La France*, and two of that most beautiful of white moss roses, *Blanche Moreau*. They should be on their own roots, and in no case should the amateur try to raise a worked or grafted rose, or she is quite sure to be surprised at her wonderful success and the vigorous growth, and after years of disappointment from lack of flowers, she will some day awaken to the fact that she has been cherishing a fine bed of the *Manetti* stock. Life is too short for mistakes which cost so much time. I have found one of the greatest annoyances in rose-growing to be false labels, and I would emphasize a caution to purchase of no firm who will not give a written guarantee that their plants are true to name. The only one of the four varieties I have named that is at all difficult to procure is the white moss, *Blanche Moreau*, but it is to be had both in Canada and the States, and it is such a peerless gem, both in its hardiness, vigorous growth, and profusion of exquisite pure white buds, that it will repay the exertion necessary to discover a firm from whom it can be procured.

The winter covering is needed more to protect from the hot suns of early spring than from the cold of winter, therefore, they should not be covered earlier than the 15th of November. The best method is to wrap a little straw about each bush, then bend the tips of the branches to the ground, securing them there with a stone, or any weight that will keep them down, then a few evergreen branches thrown over all will

keep them in safety. *La France* should have more straw about it than the others, as it is a half tea-rose, but with a slight extra protection even that comes out quite uninjured by our severest winters.

Young Stockman's Department.

Get Boys, In our Next number in this Department you will see Something of Great Interest to you all. Remember not to overlook it.

Feeding, Care, and Management of Breeding Sows, while Carrying their Young.

By ARTHUR HUNSBERGER, Tinturn, Ont.

[FIRST PRIZE ESSAY.]

Sows, while carrying young, should have special care, for upon this depends the quality of the pigs. Select good breeding stock, which are in good condition, and couple them at the proper season. A few breeding sows may run together, but not too many; and, if any of them require less food than others, or fight the rest away when eating, feed these by themselves. During the summer months, let them run in a good pasture field, and provide shelter in the field to protect them from storm and rain. Supply them with buttermilk, kitchen slops, or good clean water. When the weather is cold, put them in a pen comfortably warm, and well ventilated. In the mildest part of the day, turn them out to get exercise. Clean the pen regularly, and supply dry bedding, but not too much, for if they cover themselves and sweat, they will get chilled on coming out to eat. Their drink and food should be warmed in cold weather. Chopped barley or oats make an excellent food. Wheat bran or chops, made in a slop, may be given to them, especially about two weeks before farrowing, to keep their bowels open. A mangel may be given to each of them frequently. A little sulphur and ashes should be given to them once a week, to keep them in healthy order. It is a very bad plan to feed corn entirely, as it is heating and inclines a sow to be feverish, and is sure to have its effects upon the pigs. If anything else can be secured, don't give more than one feed a day, and that at night. Breeding sows should not be kept too fat, as they will not take sufficient exercise to keep healthy. Sows too fat will bring weaker pigs than those kept in thriving order. Change the bedding frequently, for if it becomes foul the sow will get lousy. Two weeks before farrowing, put each sow in a pen by herself, so that she may become fully accustomed to her home. Do not drive her fast or worry her by a dog, especially when heavy with pig, for this might cause her to loose her pigs. Use them kindly, and they will be more easily handled.

The Feeding, Care, and Management of Lambs, from Birth until Weaning Time.

By ROBERT M. HOOD, Ellesmere P.O., Ont.

[PRIZE ESSAY.]

When the lamb is first dropped it will be very clumsy on its large legs, and will not attempt to suck, perhaps. However, do not be in any haste to help it to rise, for it does not want milk immediately, but it does want the "licking of the ewe," which is sometimes called "nature's warmer." The attendant should not interfere too soon, for he will be apt to anger the ewe so that she may not even recognize her lamb, and sometimes she will stamp upon it in her rage.