

direct steam sterilizer for dealing with milk in bulk, a very ingenious apparatus consisting principally of three parts—the heater, the sterilizer, and the cooler. In the process steam is forced into the boiling milk, causing such an ebullition that any adhesion of milk to the sides of the vessel is claimed to be impossible. As the milk is kept above the boiling point of water, it is impossible for any condensation of steam to take place, thereby thinning the milk. The steam makes its exit through a pipe, taking with it any evil-smelling gases generated by the milk. It is claimed that the boiled flavor in milk which has been sterilized is not developed in this process. Other excellent sterilizers were also awarded medals. The last silver medal was awarded for a very ingenious invention in the form of a milk-can attachment. The apparatus consists of a small plate, only four inches long by about two inches wide. In the center is a little socket, and the milkman on his morning rounds has but to press the can against the socket, when the can, the handle, and the lid become automatically locked in such a way that the receptacle cannot be removed, neither can the lid be opened until the house door is opened. To the left of the socket is an indicator, by the turning of which the figures 0, 1, 1½, 2, and so on, indicate what quantity of milk is required. The shutting of the door places the indicator beyond interference and the attachment all in readiness for the milkman. In the event of a family being from home, or no milk being required, the servant or householder places a small button in the socket, the button becomes automatically locked, and the milkman would be prevented from leaving a can at that house, supposing he were about to do so in error.

Separation, Care, and Ripening of Cream—Skim Milk Treatment.

BY J. B. MUIR.

Tempering the milk for separating is the first point necessary at this season of the year. The most thorough skimming will be done during the winter season by separating at a temperature of 90 or 95. This can be best accomplished by heating the milk in the receiving vat to 60 or 65 and finishing in a channel tempering vat. Sudden heating should be avoided, as milk so heated separates harder than milk that has been gradually heated. When the milk has been raised to the desired temperature it is ready to separate. The separator should be started when the milk starts coming in, and by the time sufficient quantity is received to fill the tempering vat the separator will be at full speed and ready to let the milk flow into it.

The operator will do well to remember that the separator runs at a high rate of speed and needs good care. Be sure that the bearings are all well oiled before it is started, and especially is this necessary with a new machine, as the parts are all new and they fit close. As there are so many different kinds of separators, the best way is for the operator to follow carefully the instructions sent with the separator.

To those using belt machines I would recommend filling the bowl with hot water, and put on all belts before starting and bring up the speed with the engine. After full speed has been reached turn on the milk and give careful attention to the machine, and see that full speed is maintained until the separating is finished, so that there will be no loss of butter-fat. After the milk is all through flush out the bowl two or three times with warm water so as to remove all the cream.

I would strongly urge every buttermaker to test the skim milk every day. Have a bottle and catch a sample every fifteen or twenty minutes during the run, then take sample from it for the tester, as you cannot afford to lose any fat. A machine that will not skim to a trace every day will not pay any one to run, as a loss of .2 of 1 per cent. in a run of 10,000 lbs. of milk per day means a loss of about \$4.00 at present price of butter.

Care of the Skim Milk.—All creamery-men should make provision for heating the skim milk to a temperature of 165 or 170, as it will keep sweet a day or two longer, making it much more valuable to the farmer for feeding calves. This can be done at very little expense to those using belt machines by utilizing the exhaust steam from the engine. Hang a ten-quart tin pail over the skim milk vat, with a cover which has two holes in it, one for the skim milk pipe and the other for the steam pipe, and a hole at the top of the side for the milk to escape; then put a tie on the exhaust pipe at engine and conduct pipe into pail; put a valve on both pipes so that steam can be shut off from milk and allowed to escape when not wanted. By using the pail there is such a small quantity of milk that it does not cause any back pressure on the engine.

Ripening the Cream.—This is the most important part in the manufacture of fine butter, yet this point is often neglected and left to be done in a "happy-go-lucky" manner. If cream is left alone to ripen spontaneously a chance is given to all kinds of bacteria to develop, and the result depends

upon the "survival of the fittest," so that I am satisfied the best results and more uniformity can be attained by using a starter prepared from sweet skim milk. In the morning before you start separating break up the starter, either by pouring or stirring, and put into the cream vat the amount necessary to ripen the cream in the time desired, so that the flavor will become fixed in the cream before any undesirable bacteria develops. I would recommend using plenty of starter and ripening at a temperature of 70 or 75, then the cream will be sufficiently ripened before night to cool to 60 deg. or below, and by leaving some cold water or ice around it, it will be down to about right churning temperature in the morning.

Kingston Dairy School.

Several issues ago we stated that Mr. J. A. Ruddick had severed his connection with the Dominion Dairy Commissioner's staff, and had been reappointed Resident Superintendent of the Kingston Dairy School, which is now under Provincial supervision and under the directorship of James Mills, M. A., L.L. D., President of the Agricultural College, Guelph. The teaching staff for the season 1896-7 are: J. A. Ruddick, Supt. and Lecturer; W. T. Connell, M. D., M. R. C. V. S., Lecturer in Bacteriology; G. G. Publow, Instructor in Cheesemaking; J. A. Kinsella, Instructor in Buttermaking. Milk testing will also be taught by a competent instructor. The grounds and buildings have been much improved since last year. The courses provide for practical instruction, the students being required to do the work under the direction of the several instructors. The cheese and butter departments are separate. Instruction in either may, if desired, be taken separately. Milk testing is included in each course. The lectures will deal with

A Champion Berkshire.



"FRITZ LEE" 4148.

The unbeaten Berkshire boar, Fritz Lee 4148, herewith illustrated, heads the famous Golden Link herd of Berkshires owned by Mr. T. A. Cox, Sunny Side Stock Farm, Brantford, Ont. The cut shows him as in life, it being a direct reproduction from the photograph. This ideal Berkshire was sired by Baron Lee 4th 3144, bred by W. H. Gentry, Mo., U. S.; while his dam is Heather Bloom 2790, bred by J. G. Snell & Bro. This sow was by imported Royal Winnie. Fritz Lee was shown at eight fairs this year, including Toronto Industrial and London Western, and won eight (8) first prizes and headed the herd that won the medal at the "Western." He is now seventeen months old, and weighs 650 pounds, while his quality and sprightliness are all that may be desired.

the following subjects: "Milk, Its Nature and Composition"; "Milk Testing"; "Principles and Practice of Cheesemaking"; "The Cheese Curing Process"; "The Separation of Cream from Milk"; "Buttermaking"; "Packing and Handling of Butter"; "Dairy Bacteriology"; etc. Courses in cheesemaking commence December 7, January 1, January 15, January 29, and March 12. Students may enter the butter department at any time, but it is recommended that they select the dates on which the cheese courses open as the time to begin. Students may remain at the school as long as they wish. Each will be required to pay a registration fee of \$2, which will entitle him to free tuition for four weeks, and for each additional two weeks, or part of two weeks, a fee of \$1 will be charged.

Winter eggs give a substantial profit when produced in liberal quantities. To this end some preparation before winter sets in is a necessity; that is, when conducive conditions are not already present. Early pullets are the ones looked to for business. These should therefore be pushed along reasonably fast. A house ten feet by ten feet should accommodate twenty hens fairly well, but more space would be decidedly better. In going about the country we frequently find henhouses joining the cattle stable, having a slatted door between them, so that the temperature of each is kept alike. A run in a warm barnyard during sunny days has good features. Do not forget the green food, as recommended by Mr. Meyer in the *Advocate* for Nov. 2nd.

The quantity of butter made at the Government Dairy Station, Prince Albert, N.-W. T., during the past season was 27,108 lbs., and at Indian Head, 32,322 lbs. It has all been shipped.

VETERINARY.

Common Ailments of Dairy Cows.

DISEASES AND ACCIDENTS PECULIAR TO PREGNANT COWS AND IMMEDIATELY FOLLOWING PARTURITION.

(BY V. S.)

(Continued from page 452.)

In our last we considered briefly some of the causes which were productive of certain diseases in pregnant cows, and now we will look briefly at the conditions themselves, their nature, causes, symptoms, and treatment, and, as far as possible, their prevention.

Abortion.—Taking them as we find them (first, those conditions noticed before calving), we find abortion holding a high place. When pregnancy is interrupted by expulsion of the ovum or its fetus at a stage when it has not attained sufficient development to live external to its parent, abortion is said to occur; but when the fetus is expelled before the ordinary period for parturition, yet with all the organs sufficiently perfected to enable it to exist for at least some time in the external world, this is designated premature birth. There is no accurately defined limit between abortion and premature birth, and especially when the latter has been brought about by causes which produce the former.

Of all the domesticated animals that abort, the cow heads the list as losing the fetus most frequently. Abortion may be either sporadic or epizootic. When cases occur here and there over the country without any relationship as to causes they are called sporadic or accidental; but when all the cows in a village, on a farm, or over a large section of country, and all due to the same cause, it is called epizootic abortion, and attracts a great deal of attention and is a great source of loss and annoyance.

Causes.—The causes of sporadic abortion are numerous, and may be classified as external and internal. Among the external causes, atmospheric influences, bad weather or irregular seasons, sudden cold when applied to the body; hence the importance of avoiding drafts where pregnant animals are standing. Cold rains and exposure are very dangerous in this respect. With regard to food and ingesta there can be no doubt. Food of bad quality, indigestible, or containing injurious ingredients, is well known to be dangerous. Indigestible foods which ferment in the stomach, causing a pressure on the uterus, produce this accident. Upon the other hand, too great an abundance of easily digested foods, inducing plethora and a congested condition of the uterus, has been set down as another cause. Frozen food and cold water, when taken in large quantities, especially if the stomach is empty; filthy water; some plants, such as beet-root leaves, ergotized grasses, etc., are also justly blamed. Overexertion, kicks, falls, squeezing through narrow doorways, keeping animals standing on inclining floors, are all dangerous.

Of the internal influences that are said to produce this effect, very fat animals are said to abort frequently, and in some animals there seems to be a special predisposition to abort from a very trifling cause. Acute inflammatory diseases which are attended with high fever of a long duration, such as pneumonia, pleurisy, bronchitis, which produce coughing or diseases, accompanied with great pain, are fertile causes of the accident. Excitement, fear, anger, heavy thunder, fear produced by dogs, are not uncommon causes.

The symptoms of abortion need not be dwelt upon, as the average herdsman is too well acquainted with the appearance of its approach. You will generally notice an uneasy whisking of the tail, a restless, anxious expression of countenance, more or less discharge from the vulva. Very soon labor pains are present and the fetus is expelled. The secretion of milk is generally affected and usually stimulated.

Treatment.—The treatment must be preventive and remedial. Regarding preventive treatment, we must avoid as far as possible those causes enumerated as productive of the accident. With regard to those animals in which there appears a predisposition, they should not be bred again. Remove the herd from animals which have recently aborted (without delay), disinfect the premises with a solution of carbolic acid, or sprinkle lime freely. Never allow an afterbirth to remain in the presence of pregnant animals, nor a cow which has not delivered her afterbirth. If delivery is prompt and the afterbirth is promptly discharged, and no abnormal discharge present, but little medical interference is necessary or advisable; upon the other hand, if the fetus is not promptly delivered, or is in the advanced stage of decomposition, then assistance will be found necessary; and, all decayed portions of fetus and afterbirth removed, the womb should be thoroughly cleansed and a weak antiseptic injection employed. Much harm may be and often is done by the use of strong, irritating injections into the uterus, and none but experienced men should attempt the operation in case a quali-