

oats. But can we not substitute alkaloids in every way similar to the avenin? Strychnine has precisely the same stimulating effects as avenin. Can we not, therefore, substitute some compound of strychnine, such as nux vomica, for the avenin in the oat? It would now appear that we can get along quite well without oats. Corn and linseed and pea-meal would supply all the muscle-making properties of the oat, and nux vomica or some similar drug would supply the avenin. I do not write this from mere theory. I have experimented to some extent along this line with very great success, and I feel confident in saying that we can make a complete substitute for oats by having access to powerful and highly poisonous drugs. I have fed a driving horse on barley, corn and wheat bran (no oats), adding a small quantity of powdered nux vomica to the feed, and found the animal showed as much spirit and nervous energy as if fed wholly on oats. A horse seldom shows much spirit when fed on corn and wheat bran and this is why oats are so much sought after by owners of driving horses and stallions. The stallion fed on corn and barley and bran and linseed would be dull for service, and hence oats are always more the chief grain food. By feeding a small quantity of nux vomica, say a half-drachm of the powdered nux a day given in two feeds, not a pound of oats need be fed, and the stallion and driver will show as much spirit as if fed entirely on oats. On several occasions when I had no oats for my drivers I fed small quantities of strychnine and nux, and I found that the horses showed even more spirit than when fed oats largely. For boars doing heavy service oats are indispensable; but when oats were scarce with me I have fed small quantities of fluid extract nux vomica and tincture of cantharides to supply the vital principle contained in the oat. I am aware that stallioners feed stimulating drugs during heavy service, and feed so large a quantity that overstimulates the animal, causing deterioration of the offspring. Ordinary people should hesitate before using these deadly drugs. In the hands of intelligent persons and fed in infinitesimal doses—doses sufficient only to equal the vital principle in the oats usually fed—these drugs—substitutes—are invaluable, and, in parts of the country where oats are little grown, are indispensable.

J. A. MACDONALD.

Hermanville, P.E.I., July 26th, 1899.

Separating Cream by Gravitation and by Centrifugal Force

To the Editor of *FARMING*:

The specific gravity of whole milk is about 1.028 to 1.033, and skim-milk 1.033 to 1.040. The variation is due to the difference in the amount of total solids in the milk. Cream which contains the fat globules in the milk is lighter than the whole milk or skim-milk. Pure butter-fat is lighter than water, and cream containing about 27 per cent. butter-fat is about the same weight as water.

The specific gravity of butter-fat is about .930, which means that a vessel that will hold 1,000 lbs. of distilled water at 60° Fahr. will hold only 930 lbs. of butter-fat, 1,030 lbs. of whole milk and 1,036 lbs. of skim-milk.

The fat globules in the milk are not always of the same size in the same kind of milk, nor are they the same in the milk from the different herds, breeds or individuals.

The fat globules in milk when set still naturally rise to the top, but the tiny globules are so small and easily retarded in their upward tendency that they do not reach the top, and a loss of butter-fat will be the result. The Babcock test reveals this when no loss of cream is visible to the eye.

There are six causes why there may be a loss of butter-fat in the skim-milk when raised by gravitation:

1st. The breed has an influence. The Ayrshire cream will not rise as perfectly as the Jersey cream.

2nd. The individual cow has an influence. The fat globules in the milk of some cows are very small and do not rise as perfectly as they do on the milk of others.

See O.A. College Report, 1891.

3rd. The period of lactation. The cream will not rise as perfectly on the milk when the cow has been milking a long time as it will when the cow is fresh in milk.

4th. Temperature has its influence. Cream will not rise as perfectly when warm as it will when the milk is cold. When milk is cooled to 50° F. in water, the loss of butter fat is about .8% to 1%, but when the same milk is cooled below 45° F. the loss may be reduced to .2 of one per cent. I have observed this repeatedly in my experiments, and this is why the loss is so great in the farm dairy. Temperature is not considered, and no ice is stored for summer use.

5th. Crops and small pails are used by some. The result is they are losing a great amount of cream.

6th. Methods of skimming and carelessness. Here is a point in the creaming of milk where some make a great mistake. The method some adopt to take the cream off the milk after it has risen is very wasteful.

These are some of the causes why the loss of butter-fat is so great in farm dairies. The average being equal to one-quarter of the total butter-fat in the whole milk, or the cream in the milk from every fourth cow is lost in the skim-milk. No wonder so many say that cows do not pay when the raising or separating of the fat globules in the milk is trusted to the old gravity method, which entails a lot of heavy, disagreeable kind of work as well.

As a result of scientific investigation it was learned that the fat globules in the milk are lighter than the serum part of the milk, and that by means of centrifugal force the difference in the specific gravity of the fat globules and skim-milk is very much increased and that by means of the centrifugal cream separator a perfect separation of the butter-fat can be effected. By means of the centrifugal force applied to the milk in the bowl of the cream separator the skim-milk which is the heaviest part of the milk, flies with greater force from the centre of the bowl than does the cream.

The whole milk is delivered in the bottom of the bowl and by the time the bowl is filled separation has been brought about so that the cream (being the lightest) is left at the centre and the pure skim-milk is at the outside or the farthest point from the centre in the bowl. Skimming devices are now put into the centre of the bowls and are so perfected as to effect almost a complete separation of the butter-fat.

Farmers are beginning to learn the value of the cream separator for separating the cream while the milk is warm and fresh from the cows and the relish with which the calves will drink the warm skim-milk, also the labor they save and the money they make.

Farmers should be careful when making a choice of separators and get one that is adapted for family use; one that can be run by the children ten to twelve years old or by the women, as the men cannot without much inconvenience be at the house at milking time at all seasons. Also, have nothing to do with a separator that will not skim more than 300 lbs. of milk per hour, as there is too much time wasted with the small separators. Only two cream separators have been introduced into Canada that are adapted for the children to run. Both will skim 330 lbs. and over per hour and do the work right.

There are four points that the farmer should consider when wanting to buy a cream separator: (1) Its skimming capacity. (2) Easy running. (3) Time required to put it together, take it apart, and wash it. (4) Its price.

In some localities farmers are now buying cream separators as they buy other farm machinery seeing that they are the most profitable investment they can make. A binder is used on every farm for only five to ten days in a year, but the cream separator is for use twice a day, every day in the year. Some object to the price of the separator, but I do not look for a reduction for some time to come, as the demand is greater than the manufacturers can supply. There have been five separators sold this year to one last year, and the farmers never realized as they do now the profit there is to be derived from the daily use of this machine. The old gravity method has served its day and must give way to the introduction of the cream separator and separation of the milk by centrifugal force.

Guelph, Ont., July 24th, 1899.

T. C. ROGERS.