

Wireworms.

I have a piece of land which I had in pasture for about six years. I plowed it up last spring and sowed it with oats. When the oats began to grow, I noticed they were very thin, and soon began to look worse in patches. I thought it was white grubs that were working in them, as I saw several when plowing. Well, the crop was almost an entire failure. In the fall I worked the land and sowed it with wheat. It began to grow, but was very thin in places, and soon began to die, and before the snow came it was all gone but a little in one corner. Upon examination, I found what I supposed to be wireworms—a small worm about three-quarters of an inch long, and a little thicker than a pin, yellow in color, and shiny. I scratched about half a pint of earth up and found six worms in it. How will I get rid of them? Would it be wise to sow with mangels this spring, or would they destroy the crop?

W. L.

The injury is undoubtedly due to the ravages of the well-known pest, the wireworm. In answering the question, we cannot do better than quote from Dr. Fletcher's bulletin, "Insects Injurious to Grain and Fodder Crops, Roots and Vegetables," in which he says: "Wireworms are slender, cylindrical, yellowish or reddish-brown, tough and shiny grubs, with flattened heads and dark jaws. These grubs have only three pairs of legs on the three segments following the head, and a single short, sucker-like foot in the middle of the last segment beneath. When full-grown, they are about an inch long and only about one-twelfth of an inch wide. With these will be found many specimens in spring about half the size of the larger ones. Wireworms occur most frequently in low ground, and attack the roots of almost all plants, but particularly young wheat and corn just as it is coming up. They also bore into the tubers of potatoes in autumn. This injury is most frequent on land which has been for several years in sod, and the attack is most severe in the second season after the sod has been plowed down.

"Wireworms are the grubs of a large family of beetles known as click beetles, easily recognized by their power of snapping their necks with a click, with such force as to spring up into the air, if they fall on their backs. These beetles are many of them dark-brown in color, of an elongated oval form, about three times as long as broad, and tapering to the end of the body. The eggs are laid in summer about the roots of grasses and weeds, and the larvae of most species take two years to come to full growth. They change to pupae inside cells in the ground in July, and to perfect beetles about three weeks later, in August. Most of these beetles, like the May beetles, remain in their pupal cells until the following spring before emerging.

"Agricultural methods are the only remedies that have been of much avail. The wireworms which are injurious to the farmer are particularly those which feed upon the roots of grasses. When sod is plowed down, the larvae during the first year feed for the most part on the decaying grass and its roots. Those in their second year of growth change to beetles in the first year, and do little harm, as they have had plenty of food in the decaying sod, without attacking the crop; but the young larvae, which were only half-grown when the sod was broken, attack the crop of the following year because there is nothing else on the land for them to eat. It has been found that barley and rye are less attacked than any others of the small grains, and also that clover is little injured. These early-maturing grains are, therefore, better suited as a crop for the second season after sod, because the land can be plowed immediately after they are harvested, and thus the pupae and the freshly formed and still soft beetles are disturbed in their pupal cells, and many of them destroyed. Clover may be sowed in spring with either of these crops, and either plowed down with the stubble in September, or left on the land until the following autumn, when the land should be plowed as soon as there is a good growth after the first cutting. A short rotation in which land is not left in grass for more than two years will to a large measure prevent the ravages of wireworms.

"Prof. S. A. Forbes recommends plowing down sod in autumn and sowing to fall wheat or rye, with clover on these in the spring, the clover to be left for two years, and then followed by corn or roots. Some have obtained good results in clearing land of wireworms by plowing twice in the same autumn, the first time in August, the land to be well harrowed a week later, and then cross-plowed in September."

In this particular case, if the mangels are sown on the land, we would advise fall plowing after the crop is removed, to destroy as many of the pupae as possible.

THE DAIRY.

Ropy Milk.

Every season finds many dairymen and users of milk perplexed over a ropiness or slimy character in the milk. An article by John Golding, F. I. C., T. C. S., in the March issue of the Journal of the Board of Agriculture, deals rather exhaustively with this subject. Mr. Golding says, in part:

Of all the abnormal changes which sometimes take place in milk, one of the most common and persistent is what is called "ropy" or "slimy" milk. Such milk, when poured from a jug, has a rope-like form. A spoon or wire dipped into the milk and then taken out draws after it thread-like strands sometimes over a yard in length. Such an abnormal appearance naturally alarms the consumer, while the persistence of the trouble frequently causes great loss to the milk vendor.

Cause of Ropiness.—The appearance of ropiness in the mixed milk of a herd several hours after milking, is due to the growth of bacteria, which, as a general rule, gain access to the milk after it has left the udder of the cow, though in a few instances they may exist in the udder before milking.

Garget Milk.—Ropiness is sometimes observed in milk from individual cows, notably in cases of inflammation of the udder. In such cases the cause may be either bacterial or non-bacterial. If the ropiness does not increase as the milk is kept, and cannot be propagated by transference into another sample of fresh milk, it is probably due to the presence of fibrin and white corpuscles from the blood, which form masses of slimy material in the milk. Such milk is known as garget milk, and it is unfortunate that the term "ropy" should be applied to it, since this use of the word gives rise to the common impression that all ropy milk is unwholesome.

Although garget milk may not cause other milk to become ropy, organisms are present in the milk which may lead to infection being spread from one cow to another by the hands of the milker. For this reason, prompt attention should be given to all cows suffering from this disease, and all sources of infection avoided.

An organism (*Bacillus Guillebeau*) which makes milk ropy has also been found in Switzerland in the inflamed udders of cows.

Not Injurious to Health.—With the exception of that caused by *Bacillus Guillebeau*, which comes from diseased udders, ropy milk caused by bacteria is not injurious to health, certain kinds of ropy milk being much prized in some countries as an article of diet, but its mechanical condition and appearance are so abnormal that it must be quite an acquired taste. Ropy whey (made from *Bacillus lebanis*) has been given to pigs, and found they apparently preferred it to ordinary whey.

SUMMARY.

Causes of Ropiness.—1. Ropiness in the mixed milk of a dairy herd, which increases on allowing the milk to stand, is due to the growth of bacteria.

2. Milk which is ropy at the time of milking may or may not be due to the growth of bacteria; but, though it may not cause an outbreak of this trouble, it should not be used for food, and should be regarded as more harmful than ropy milk proper.

3. In cases of garget or inflamed udders, special care should be taken against the infection of other cows by the hands of milkers, etc.

4. With the exceptions mentioned in 2 and 3, ropy milk is wholesome, and does not endanger public health.

5. The organism may come from water used for washing dairy utensils, etc., or from water in which dairy cows have been standing, or which has otherwise been splashed on their flanks or udders.

6. The trouble may also come from dust and straw, as well as from the butterwort and probably other plants.

7. Some forms of ropy milk organisms grow at the temperature of cooled milk.

8. Wooden vessels tend to encourage the persistence of the trouble, as do also dilute solutions of soda, if these are not freshly made from boiling water.

9. Most of the organisms require air for their growth, and the cream layer, therefore, tends to go ropy before the lower layers of the milk.

10. Some forms of ropy cream make butter which quickly goes rancid; but, on the other hand, other organisms are prized as "starters" in the making of Edam cheese.

Tests to be Used in Cases of Ropiness in Milk.—1. It should first be ascertained whether the outbreak is caused by bacteria by adding a few drops of the affected milk to some sound new milk in a clean glass. This should then be placed in a warm room and kept loosely covered, to prevent dust getting in. The time taken for ropiness to appear should be noted.

2. The cows should be examined, and samples taken in clean glasses from the milk of individual cows and from the mixed milk after straining, cooling, etc. The time taken in each case for ropiness to appear should be noted.

3. To a glass of clean, fresh milk from another source should be added some of the water used for washing the churns and pails, and to another glass some of the water which the cows drink. A glass of this milk should also be left exposed in the dairy.

The results of these experiments may indicate the source of the trouble, but it is well to adopt the following practical measures:

Prevention of Ropy Milk.—1. As water is a frequent source of the trouble, special care should be taken in washing the milking pails, strainer cloth, etc., after each milking. When thoroughly clean, these should be well scalded, and should not again be rinsed with cold water. It is well to scald the pails, etc., shortly before milking.

2. Great care should be taken to see that no water is splashed into the milk in the process of cooling, etc.

3. As dust is sometimes a carrier of these germs, the pails, etc., after washing, should be kept upside down, and the milk, when it is in the pails, should be kept covered as much as possible.

4. The rooms where the milk is kept should be well cleaned. Wooden, cement or stone floors may be cleaned with a mixture of five parts sulphuric acid to ninety-five parts of water, but care should be taken that this does not get on the clothes of the person using it.

5. Wooden vessels should not be used, as they may persistently retain the ropy-milk organisms. It is not well even to use wooden troughs for washing milking vessels, but when they are used special care should be taken to clean them on all such occasions.

6. Dilute solutions of washing soda favor the growth of the organism, and it would be better to use sodium hypochlorite or some other cleanser and disinfectant in cases of an outbreak of ropy milk.

7. Straw has been shown to hold ropy milk organisms, and the custom of wiping the udders of the cows with a wisp of straw before milking is very bad. After washing their hands for milking, milkers should not handle straw or fodder, nor should any such material be brought into the cow-byre just before or during milking.

8. The cows should be kept clean and the udders should be washed and disinfected with a very dilute solution of formalin, especially if the cows have been standing in dirty water or wading through mud.

9. Ponds and streams should be fenced off so that the cows cannot wade in them.

10. On the first indication of an outbreak of ropy milk, the cows should, if possible, at once be turned into another pasture.

Low Overrun.

I am sending you a copy of the summary of the business of a dairying company of which I am a patron. I would like to have your opinion whether the company is dealing fairly with its patrons. They make 105 pounds butter out of 100 pounds butter-fat. Is not that too little? If so, could redress be had, and how? If there is anything else wrong, please give us the advantage of your knowledge.

M. H.

Taking the figures as they appear on the statement of the Lake Verd Dairying Co., it would appear:

1. That the overrun is about 5 per cent. In general creamery practice, this is about 10 per cent. too low.

2. There are several factors which might bring about a low overrun: (a) Over-reading the tests. This would credit the patrons with more fat than they really delivered to the creamery, and would make the price of a pound of fat appear low, and show an apparent low overrun, although the usual quantity of butter and, therefore, the usual overrun, may have been made from the actual fat delivered. If more fat was credited to the patrons than they delivered, then the total fat divided into the money received for the butter would of necessity make the price lower. In other words, the patrons, although apparently paid a low price per pound of fat (and a low overrun shown on the statement), may have really received all the money from a normal overrun, as they would each be allowed for more fat than they delivered. (b) Composition of the butter. On a basis of 5 per cent. overrun, if all other conditions necessary to a normal overrun were observed by the buttermaker, the butter would contain only about 3 or 4 per cent. of moisture, instead of the usual quantity of from 12 to 13 per cent. If such is the case, then each 100 pounds of butter would contain about 95 pounds of milk-fat, while average butter contains about 85 pounds of milk-fat to the 100 pounds of butter. In testing the composite sample bottle uncorked would allow evaporation of moisture, and, therefore, the milk and cream tests would be too high.