

necessary strength and power. The difference between two or three thousand pounds of milk a year per cow and fifteen to twenty thousand pounds is a very wide one. It is utterly impossible for a cow to produce large milk yields unless she has the stamina and gets the right feed and care.

It would be impossible to feed at a loss a cow giving a large yield of milk, no matter if the feed was expensive, if the dairy products were sold at any reasonable value. For instance, a cow producing 15,000 pounds of milk a year; her milk should sell for from \$150 to \$200, so that it would not be possible for a cow to eat anything like that amount in feed. It is not, however, necessary to feed a cow on an expensive ration. The difference between a 3,000 pound cow and a 15,000 pound cow is very wide. There is an equally wide difference between the cost with which cows can be fed, when the right kind of feed is provided for them. The right kind of feed most suitable for milk production can be grown on almost any farm.

THE MATTER OF FEEDS.

Take those foods which can be produced most easily on a given quantity of land. By good tillage and proper care 16 tons of mangels or sugar beets can be produced easily on an acre. On a quarter of an acre it would give us 8,000 pounds, which is enough to give a cow 40 pounds a day of this feed for 200 days. To feed with this a man should grow some corn for silage purposes. He could grow 15 or 16 tons of this to the acre or enough on a fifth of an acre to feed a cow 30 pounds of silage for 200 days. We can grow enough feed on less than half an acre to feed a cow 40 pounds of mangels and 30 pounds of ensilage for 200 days. If the cow is dry it would be probably better to feed her on 40 pounds of silage and 30 pounds of mangels. Now, if we add to this some straw, we have a fairly good ration. This straw, though not complete in itself is 90 per cent. better than 90 per cent. of the cows throughout the country are fed and this feed, remember, is grown on half an acre.

What excuse then has a man for feeding a cow poorly? Surely it is a short sighted policy to keep cows that produce so little. It is an equally short sighted policy to keep them when their low production is generally caused by their being fed so poorly; and yet a splendid ration can be produced on half an acre and a dry cow would take on flesh and be in good condition if fed nothing else besides this low costing ration. Do not let it be understood, that we do not recommend feeding grain or mill feed with this ration. To heavy milking cows a mixture of oat chop, a little oil cake and bran added to the silage and roots make a ration that cannot be improved upon if the idea is to get the greatest production from the cow and it also furnishes us with the cheapest possible feed we can feed the cow so that we get by providing this proper sort of feed the maximum of yield at the lowest of cost. Now, don't run away with the idea that we are trying to qualify for a mining stock promoter and trying to write up fairy tales, but take a pencil and figure up for yourself if everything stated is not a fact. Why then will people continue to work twice as much land to get half the produce when they can get such grand results by following the proper method?

Exercise For The Dairy Cow

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The laws of nature prescribe that all animals to be in the best condition for their work and to do the best work must have a reasonable amount of exercise. Why many of our teachers make an exception in the care of the dairy cow I have never been able to understand. The dairy cow requires the exercise necessary to maintain

good muscles, the proper use of her legs, as well as the invigorating effect of outdoor air and sunlight.

If in the fall on fine days two or three times a week the herdman makes it a practice of unhitching his cows, they will be quick to take advantage of it and get the proper amount of exercise. I may be told that there will be a decrease in the yield of milk. I have not found this to be the case. If it be, the benefits resulting from better milk, more rugged animals and better health and therefore freedom from disease, will more than compensate for the loss in milk.

Professor Henry in "Feeds and Feeding" 7th edition, page 465, has the following to say concerning exercise: "It is certainly reasonable to hold that the cows cannot maintain the high standard of bodily health and vigor essential to the production of *healthful* milk when she is closely confined in the stable for long periods without opportunity for outdoor air and exercise. "The change affording opportunity to breathe the pure air and drink in the sunshine, as well as to exercise the numbers which have not been called into action while in confinement, and resting those taxed by occupying a forced position in a stall or stanchion."

Care of the Udder

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All domestic animals are liable to suffer from "Mammitis," or inflammation of the udder. This disease is also known by the name of garget. The cow, however, is more likely to suffer than any other animal and from the importance of the lactical secretion it is always more or less serious and if not looked after in early stages, it is likely to interfere very much with the usefulness of the animal in the production of milk. The disease is more likely to occur during the first month after calving because during this period the udder is usually in the height of its functional activity occasionally it is met with previous to calving.

CAUSES.

Mammitis is due to a variety of causes. In most newly calved cows (especially in heavy milkers), we find a certain amount of inflammation in the udder due to the great activity of the gland at that time, but it usually quickly subsides as soon as a portion of the milk is removed, which should be done regularly and repeated often enough to prevent the inflammatory action from increasing. Exposure to wet or cold, such as lying on the cold ground or exposure to draughts are predisposing causes. Filthy and poorly ventilated stables will generate a miasma, which is liable to have an injurious effect on the udder.

Too much stimulating food is likely to set up a plethoric condition of the system which has a tendency to produce the disease and it is sometimes produced because of the presence of tubercular deposits in the udder. It may also be produced by mechanical causes such as contusions, wounds, injuries in milking or from blows from the head of the calf while sucking.

TREATMENT.

If taken in the early stages this disease usually yields readily to treatment. A good strong dose of purgative medicine such as a pound or two epsom salts should always be administered. Then heat and moisture should be applied to the udder in the form of fermentation or poultices. A convenient method of doing this is to support the udder with a broad bandage brought up and secured over the loins, four holes having been cut in the bandage through which the teats will protrude. Then stuff cloths wrung out of hot water between the bandages and the udder, the cloths to be renewed as often as necessary to maintain heat and moisture in the parts. In thus poulticing the udder it is a good practice to remove wet cloths at night and replace with wool which

has been heated by placing in a bread pan in the oven which will keep the parts warm over night, the poulticing to be repeated next day if necessary. Poultices often do more harm than good, if allowed to become cold and sodden over night, but the heat of wool will prevent any injurious reaction. This treatment combined with hand rubbing the parts freely and the application of a little oil will generally prove successful in the early stages. If one or more quarters of the udder are badly affected and are very hard and sore, and especially if matter has formed, the dairyman will generally be consulting his best interests by employing a competent veterinary surgeon. And even then there is a danger of the gland being more or less damaged and possibly destroyed. Not infrequently the disease in such advanced stages, will prove fatal.

The Smuts of Grain Crops

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The so-called "smut" diseases of grains are all due to minute parasitic plants (fungi) which live in the tissues of the plants they attack, finally producing the familiar black powder masses. The cereal smuts are peculiar in that the disease occurs only on the chaff and developing grain. We shall consider in this article the Loose Smut of Oats, the Stinking Smut of Wheat, and the Loose Smut of Wheat, and in order to get a better understanding of their nature we will first briefly consider the life history of each.

LOOSE SMUT OF OATS.

If we examine with a microscope the black powdery mass which forms on the attached flowers we find that it consists of millions of tiny bodies called spores. These spores are the reproducing bodies of the fungus, corresponding in a way to seeds. They are scattered by the wind and lodge around the developing grain and in the chaff of neighboring plants. When seed grain with adhering spores is sown both germinate together. The result is that a minute fungus thread or "hypha" is produced which penetrates into the delicate tissues of the oat seedling. Once established here the fungus develops into a web of fine threads, living at the expense of the oat plant. As the latter branches or "fillers" a portion of the fungus is usually transformed to each branch and grows with it, always keeping near the tip. Here we find that usually every stalk of an attached plant will show the disease. When the time comes for the plant to produce flowers and seed the fungus develops exceedingly rapidly, grows into the flowers and uses up the food stuffs intended for building up the seed in the production of the enormous numbers of black spores which we know as Smut. We see then the infection of the plant takes place during germination and it has been proved that once it gets beyond this stage it is safe.

STINKING SMUT OF WHEAT.

The life history of the parasite causing this disease is the same as the last but the mass of spores remains enclosed within the attacked grain. Such smutted grains appear plumper than healthy ones and when crushed are seen to be filled with a foul smelling, dark-colored, greasy mass of spores. These are only scattered on the breaking up of the grain in threshing, etc. Stinking smut is more objectionable than loose smut since the spores of the latter are mostly blown away before harvest whilst the infected kernels of the former, if precautions are not taken to remove them, may give their foul smell to the flour.

LOOSE SMUT OF WHEAT.

In this case infection takes place by a spore being carried to a flower. Here it germinates and the fungus takes up its abode inside the young germ of the seed, remaining inactive unless just considered. The treatment for these various smuts will be given next week.