## Digestive Tract
## Parasites and Economics

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*Incidence*

*Treatment for Cattle Parasites*

*Prevention*

# Incidence

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First of all, why should we be concerned about internal parasites in cattle. Figures released by the United States Department of Agriculture in 1965 compared the losses over a ten-year period. Losses jumped in cattle from about 27 million dollars to about 147 million. Almost the opposite occurred in other species, and to me it indicates that up to 1965 we had not been too concerned with internal parasites in cattle. We did do a pretty good job of controlling them in all the other species.

These things are hard to see. The largest are about one to one and a quarter inches long. They are roughly about the size of a hair on your eyebrow. They lay eggs at a very rapid rate. They can lay up to 10,000 eggs a day, or seven eggs a minute and I am sure that if you had some chickens that would perform that well, you would soon have the egg market cornered!

How do they reproduce? Well, the eggs pass out in the fecal material which is an ideal incubator for internal parasites because of the fibrous nature of a cow's diet. The eggs will hatch when the temperature is about freezing in about five days. Then the larvae will wiggle their way onto a blade of grass and they will sit on this blade of grass, waiting for the animal to come along and consume them. They are swallowed and within 15 days they can start laying eggs again. I feel that the life cycle can take place in as short a time as 21 days. If winter sets in, freezing prevents hatching and we know that these eggs will survive for a period of two years on pasture. They will survive twenty below zero!

How do they produce damage? The mouth of a roundworm has little tooth-like projections. The way they produce their damage is that the mouth acts as a suction cup. They will suck up a gallon of exudate into that area, digest the tissue away and then they will suck blood. They have a straight digestive tube so the blood goes right through them. But at the same time they do produce a severe loss of blood in a heavily infected animal. This, of course, sets up a chain reaction within the animal, so the animal not only has to fight the effects of the

roundworm but also the side-effects they set up.

Number one, lowered resistance, making the animal a prey of diseases, such as pneumonia and so forth. For some reason or other the animals that are infected with parasites do not eat as well, resulting in less appetite, therefore less weight gain. Body functions are less efficient, resulting in poor conversion of feed and, of course, anemia results in weakness and emaciation.

Still another way to produce damage occurs in the abomasum. Some parasites have an affinity for the digestive enzyme glands with nodule formation. On histopathological examination you can see the worm lying in there plugging up the gland. This of course sets up another chain reaction that reduces the secretions of the digestive enzyme and interferes with complete digestion. In effect, food will pass through the stomach unchanged almost like a straight pipe.

Another way to produce damage occurs with arichostrongylus infection, which causes a tremendous irritation in the abomasum. You might conceivably misdiagnose this for mucosol disease. This sets up another chain reaction. Not much absorption occurs within the abomasum wall and ulcers form and toxins enter the body as a result of the wounds. The tissues thicken and fill with fluid, forming ulcers, which is another way that the digestion is reduced. I have seen abomasal walls an inch and a half thick.

Diarrhea is another condition that is produced by worms. Now, what are the symptoms? Well, bottle jaw is one with which you are all familiar. Not all cases of swelling in that area are necessarily caused by worms, but you might be suspicious of it when you see this.

### Diagnosis

Number one, clinical symptoms—not too often do you see clinical symptoms up in this area, down south it is more frequent. Unless you happen to see unthriftiness, diarrhea or bottle jaw, you will not see too many cases of clinical parasitism.

A postmortem examination is the only sure way, but unfortunately it is not a very practical way because not many people are going to let you kill a calf just to check for worms! The only other available technique is to count the eggs per gram of feces. There are some deficiencies to egg counts, such as, *the eggs look similiar. The species have different egg-laying rates.* For instance, trichostrongyles may lay only 300 eggs a day compared to *hemonchus spp* that may shell out 10,000 eggs a day, and so this would have an effect on the egg counting technique. *Uneven egg production* often occurs—these worms are like you, sometimes they like to take a coffee break, and they simply quit laying eggs for awhile! If you happen to take a sample at that particular time it may well be zero even though the animal is infected. *The variable immunity* of the host is a factor—the older the animal the more immunity is present and therefore less egg production. *Richness of feed* is an important factor. Animals on a high-grain diet show a drop in egg counts in about five days time. So, if you are

checking animals that are on a high-grain ration be careful you do not fall into this problem, because they are simply not laying as many eggs as they would on a normal diet. Some other things that can cause E.P.G. variations are: *consistency of the feces* — diarrhea causes a dilution factor thus cutting down the egg count. *Volume of manure* would have an effect. In England they found that parasites lay more eggs in the morning than in the afternoon. I don't know what that means, maybe you should take the sample in the morning!

Don't forget dairy animals, they have worms, too! Where do they pick them up? Usually around water troughs. Each manure pad in a normally infected animal will contain somewhere between a quarter of a million and a half of a million worm eggs. These animals will mill around the troughs for a couple of hours a day and that is where they really pick them up.

Another common practice is to take them hay in the same area daily. Manure pads will build up and eventually, when the spring rains come, the larvae will hatch out. All the dairyman has to do is graze his cows there a couple of times a week and they will have a pretty good burden of parasites. Low moist pasture area is an ideal place for parasites to survive.

What is the incidence? When we first started out we figured that below the Mason Dixon line about 100% of the animals were infected, whereas in the northern areas, about 93% infection occurs. The surveys established the fact that wherever there is grass, cattle will have worms.

Over 90% of all herds are infected and over 70% of individual animals are infected. Why is parasitism on the increase? Because we have an increase in livestock numbers, far more cattle than we used to have and this is a disease of concentrating animals—where you are raising animals in closer confinement.

A recent survey of calf sales in Colorado, Kansas and Texas, when 4,000 calves were sold on a particular day, showed that within three days they had gone into 17 different states! Had they been exposed to foot and mouth disease they would have exposed 500,000 to a million cattle during their journeys. These are some of the reasons that parasitism in cattle is on the increase.