A Discussion of Grubs—Feedyards to the Packer

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The cattle grub is a pest that has been with us for many years, but is one that has often been neglected. With the coming to our industry of the cattle feeding era, we saw much more interest in the cattle grub problem. Prior to the 50's, no materials were available except a product that would kill the cattle grub when it was in the back. Rotenone was used but only killed those larvae that had already cut an air hole in the back. In the mid 50's, systemics were discovered which did effectively control cattle grubs. Since that time, many products have come forth that will effectively control cattle grubs.

We need to look at several different aspects of cattle grub control, including the life cycle. The two species are: *Hypoderma lineatum* (southern cattle grub), and *Hypoderma bovis,* (northern cattle grub). Many years ago in our industry, we saw the southern cattle grub primarily in the southern states and the northern cattle grub primarily in the northern states. Because of the high mobility of our cattle population, we see northern cattle grubs in the southern states and vice versa. This makes it extremely difficult to know exactly when infestations will occur. The normal cycle is for the adult fly to lay eggs on the lower extremities of the animal's body, oftentimes on the legs or on the hairs along the under line. The eggs are glued to the hair. The eggs hatch and the larvae then migrate down the hair, enter the skin and start a 7-9 month migration through the animal's body. The southern cattle grub goes up into the gullet region where it spends 2-3 months; it has spent 4-5 months getting to this point. After about 2-3 months in the gullet region, it then moves up to the back where it spends between 2-3 months and then emerges to the ground. The northern species has much the same cycle except that it goes from the center portion of the animal's body straight up into the back. If treatment is applied while the grubs are in the region of the spinal column, the animal may show paralysis. Should this occur to animals that have grubs in the gullet region, an anaphylactic shock may result. We may see breathing problems and bloating may develop.

In the feedlot industry, we are concerned about having grubs in the back when animals go to slaughter. It is imperative that animals be treated when they arrive to insure that no grubs are present at slaughter. The benefits far outweigh any risks that may occur. Very few problems have been observed from anaphylactic shock. Many of the old timers in the West Texas area say they have seen cattle gadding or running every month of the year. We may have a few grubs in various parts of the animals' bodies almost any time during the year.

The grub is a small parasite that migrates between the muscle fibers. The first instar of the grub is about the size of the lead in a pencil and a quarter of an inch to three eighths of an inch long. When it reaches the back and becomes a "warble" an abscessed area develops, an air hole is dissolved in the skin by enzymes secreted by the larva. The air hole is necessary for the larva to survive. After spending 6 weeks to 3 months in the back, the larva works its way out of the back, through the air hole and drops on the ground. It then changes into the pupal stage of the life cycle. In the pupal case, the transformation occurs from the larva form to the adult. After pupation is complete, the adult breaks the end of the pupal case off, emerges, mates and the process is started all over again. The amount of damage that the grubs themselves do in their migration is difficult to estimate but the trim loss to the carcass is the big loss.

The heaviest infestations are seen first in yearlings, two year olds, calves and then older animals. We may have a light infestation, 3 or 4 grubs in an animal that is 3 years or older. Younger animals may carry 40 or 50 grubs. This is apparently due to a developed resistance from previous infestations. Before the advent of the systemic materials, it was not uncommon to find 200-300 grubs per animal. Now, we seldom find more than 20 or 30 grubs on an untreated animal.

The adult looks very much like a bee. It is a small, yellowish, hairy looking fly, and has one sole purpose in life, that is to mate and lay eggs. It has no functional mouth parts and it is not capable of biting or stinging the animal. The adult mates and lays eggs and then dies as soon as the energy that is stored in its body is burned up.

The hide is damaged from the holes that are dissolved by the larvae. The value of a hide is greatly reduced by the presence of grub holes. The real damage and economic loss comes through from the trim loss performed by the packer. When this occurs, the packer then "docks" the feedlot or owner for the damage. Adult grubs run cattle, as a result of running, weight is lost. This occurs normally in a pasture or range situation. Once again, the adult has no functional mouth parts; and it is not capable of biting or stinging but the animals do flee. They will run through fences, stand in water, and will spend very little time grazing when adult heel fly activity is taking place. In the West Texas area, this usually occurs in the late winter or early spring months. This is going to vary depending upon your geographic location.

Cattle that have been properly treated with one of the various products on the market should have effective grub control. At some point in time during the past few years, I

have evaluated nearly every cattle grub product that is currently on the market. Control has ranged from 75% up to 100%. The effectiveness may be dependent on what I refer to as "Friday Afternoon Syndrome." In other words—how good is your management? If the dip vat was charged correctly, if the chemical was mixed correctly or if the injection was given properly, control should be obtained. The products that are currently on the market should practically eliminate any potential grub problems.

Another factor to consider is that the animals could be re-infested from late strikes. This normally does not occur in a feedlot situation.

There seems to be a direct correlation of the amount of trim loss that occurs and the profit margin that the packer or meat industry has. A packer cannot dock the feedlot for bruises but they can dock for grubs. And, many times bruises are mistaken for grubs and dockage does occur. Do not hesitate to follow up on a call if you have a packer that calls and docks one of the feedyards you are working with....get there as soon as you possibly can, before the carcasses lose their identity. Go in the cooler and examine the carcasses. Stand right behind the hide puller and check the hide and carcass as soon as the hide is removed. Often you will find no grubs or if there are any, they are flaccid (grubs that were present and have been reabsorbed with only the chitinous exoskeleton left). In most instances, the packers have readjusted after checking and no grubs were found. In one instance the person making the determination between bruises and grubs apparently didn't know the difference. We need to look at this very professionally when we have a problem like this develop.

I am sure we've had times when the product failed to work properly; maybe the dip vat was not mixed correctly or the injection was not given. This is what I refer to as the "Friday Afternoon Syndrome." This is a people problem, we need to pay a great deal of attention to our management. We need to stay on top of our quality control.

In a feedlot situation, I have not observed any problems from anaphylactic shock reaction to grubs. We've had some instances where cattle were killed with the pesticide and this occurred, once again, from a people problem.

I think that the cattle grub is an interesting pest. It is one that we have greatly reduced in numbers. It also occurs in horses occasionally, but normally doesn't complete its life cycle. Many of the ranches in the northern states have to keep an extra 30% of horses due to grubs coming up in the horse's back. Even though it won't complete the cycle, it makes a severe sore where the saddle needs to be and puts that horse out of commission for several weeks. It will complete its life cycle in the bison or buffalo.

We mentioned earlier that the adult heel fly has no functional mouth parts, and does not sting or bite the animal but after they mate, they do lay the eggs. An incident occurred a few years ago in Canyon, Texas, which is where I reside. A rancher was working cattle and accidentally ingested a fly while he was horseback penning cattle. He sucked the fly down into his lungs. At the time, he didn't know exactly what had happended. As a result of this, he had pneumonia problems from the foreign particle in his lungs. He got over that but started having this weird sensation that something was crawling under his skin. He went through several medical doctors and ended up seeing a dermatologist and me. He came to my house and we extracted what looked like a little pimple, actually he pushed on it and a small larva popped out! I identified it under a microscope and it was a common cattle grub. This gentleman experienced six such grubs emerging from his body, in various places, from behind his ear to his ankle. This was a very painful and traumatic experience for him. So, it can occur in humans as well as cattle. Once again, it will not complete the life cycle but grubs can infest man.

The cattle grub is an interesting pest. It lends itself to a possible eradication by an area wide control program. Some efforts are being made in some northern valleys in Montana, and also in Canada to greatly reduce or eliminate cattle grubs in small specific areas. With the products currently on the market, we are seeing a great reduction in cattle grub activity. It is going to vary from ranch to ranch, but because we put together cattle, we need to assume that everything coming into the feedyard will be grubby and handle it accordingly. If you do have some problems with grubs showing up in animals that have been treated, I suggest that you contact your company representative that manufactured the product and maybe check with some other people that have been working in this particular area.

In the feedlot, or on the ranch, there are other things that go along with the control of the pests, and that is people management. I made reference to this earlier and I think it is very important that we try to keep down stress. Dr. Dee Griffin has said on many occasions that one of the most important men in the processing crew is the man who brings cattle up to the chute. He must know his job and know how to properly handle cattle to reduce stress. If we are using a dip vat material or even a pour-on organophosphate material, we need to have those people that are working very closely with that product have cholinesterase samples or levels run prior to their starting to work with those products. Periodically during the processing season, have them checked to be sure no organophosphate poisoning is occurring. There have been several people that have actually been poisoned from this type of exposure.

Not only do the grubs create a lot of trim loss should they occur when an animal goes to slaughter, we get some irritation in the back, which means damage to the leather or hide. We can get some secondary infections where the grubs have that hole open in the back. We often see abscesses and enlarged areas of pus that take somewhere between 6 and 8 weeks to reabsorb. It has been reported to us that larvae have even been found in a rare steak.

Cattle grubs can be controlled, they can be very effectively controlled, but it takes management. I think this is the key to the whole process. We **must** apply proper management.

Since we know that our cattle are moved around so much, even though our cattle are coming out in the summertime, we may still end up with cattle with grubs in the top line when they go to slaughter. So, let's keep track of our animals, follow our information when they come in, try to find out a little bit about location. Follow up and make sure that those animals received all the treatments that they needed.

Once again, we need to look at this from a total management aspect. Cattle grubs are a problem to us; they are a problem to the packer. The packer and the feedlot can exist with this problem; but, they must work together. Quite often there have been problems when the packer falsely accused the feedlot or vice versa, so occasionally we will get caught in a trap where one is trying to place the blame on the other. It is a very easy problem to follow up on and one that I think we need to pay a great deal of attention to.

We have many products on the market. There is a constant search for new and more effective products. We need to read and follow that label. In our profession, it is a real temptation to change the label based on information that we think we have available, but we need to follow that label. We have enough problems with FDA and EPA as far as keeping these materials available for our use. We need to keep around as many as we can. Lawsuits have become common place. We need to take every precaution we can including that human safety factor to make sure that we do not have a situation where a lawsuit could be set up.

If you ever do have a reaction to grubs, I can assure you, it will be Little Johnny's Club calf; it is the only calf he has and you've treated it because you and his Dad quail hunt together or something. Should this occur, you are all aware of how to counteract that and try to prevent permanent damage to that animal from the anaphylactic shock or the grub problems. Also, on our club animals, one grub is too many when an animal is in a show ring. So, we need to pay particular attention to that.

To summarize, I would say that we have the tools available to give us effective grub control. It gets back to a management situation. If we apply proper management, we should have no problems controlling grubs in a feedlot situation. Should problems exist, I am sure there are answers as to why. But, once again, do not overlook the fact that those grubs on carcasses may be bruises. The reaction we see may be organophospate poisoning and not reaction from grubs from anaphylactic shock problems, so evaluate all your different alternatives before your decisions are reached.

Questions & Answers:

Question: Have you encountered resistance to grub treatment?

Dr. Clymer: I don't think we have resistance to these products. Sometimes we have a re-strike and end up with some grubs. I remember a client who ingested a gravid female and eventually six 'warbles' emerged from various parts of his body!

Question: How about treatment of lice?

Answer: We have five different species of lice and often we get good control but it takes two applications. There is not much difference in the products if used properly.

Question: Have you used Warbex as a pour-on?

Answer: A pour-on will give fly control for 2-4 weeks. Various products have different levels of stress on the animals.

Question: What about back-rubbers?

Answer: Some back-rubbers and oilers are very good if you can get the animals to use them.