

Prevention

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Any internal parasite control program involves more than one phase, and that is therapeutic worming. We like to think it involves, first of all, a high plane of nutrition, consequently a high state of health. The second part of any effective total parasite control program, we feel, of course, is the prevention of reinfestation on pasture. Now, I am talking about pastured animals whether they be cattle or sheep. I am not talking about feedlot programs which are different, as you know.

How does one prevent reinfestation? Well, you do it with rotation of pastures and I think that has been talked and written about for a long time. The other way is through chemotherapy. I am going to talk about phenothiazine's new role. During the last few years, phenothiazine's true role is coming to the fore in the prevention area. So that is what I'll be talking about. I do not think it is wise to take 75 cents, a dollar or maybe a \$1.50 away from a cow-calf operator and then turn the animal back on a pasture where its chances of becoming reinfested in 30, 40 to 45 days are very high! If there is something that can be done inexpensively in this direction we should adopt it.

What is the effect then of phenothiazine on a daily dose basis? That is what we are talking about. The FDA has approved the drug for continuous feeding to adult cattle, two grams per head a day, and to sheep at a gram per head a day. What does it do when it is in that mineral or liquid supplement, or whatever type of medium it is in, when it gets into these calves? Well, it inhibits ovigenesis, and I think that is quite well known. The eggs that are laid often will not hatch out so it does have some ovicidal activity. Also, it is a kind of a three-barrel type of "shotgun" effect, which is delightful. It has some larvicidal activity and a great deal has been learned about that. In the event that you happen to run egg counts on animals that are on a mineral that contains phenothiazine on a daily basis, be sure and be careful how you evaluate your egg count, because even though you might be seeing eggs, chances are they are not viable, they are not fertile and will not hatch out.

How does phenothiazine do this? It is known that phenothiazine enters the cuticle of the worm—and believe me, from that point on very little for sure is known! Phenothiazine probably affects the cobalt metabolism of the worm. The literature is full of references to that and it is supported by a great deal of work. It has been shown for example, that in cobalt-deficient lambs, the egg count decreases and actual clinical loss decreases when there is an actual cobalt deficiency.

It has also been shown many times that by adding cobalt the egg count increases and the pathogenicity of certain species of worms also increases. Then it has been shown, repeatedly, that you can add phenothiazine and the egg counts and the pathogenicity decrease.

This is one area where there is a great deal of work to be done. A few people, including my own company, are underway in getting some more definitive answers on the actual effect of this drug on the intestinal tract of the worm.

In review, daily doses of phenothiazine do work due to some mechanism or another. It does work on an every day basis and this is going on incidentally in many parts of this country without a big problem and without a great deal of worry as far as acquired resistance is concerned. We are not really concerned of course with the mother cow as far as gain and efficiency are concerned, but certainly we can increase the weaning weight of the calf. Maybe more important to many of us is increasing the carrying capacity of that range by simply reducing the load that the range has to carry in viable eggs. All of this, thankfully, can be done rather inexpensively.

So consequently, I think the future of phenothiazine is in this area. We talk a great deal about prevention and here is one area where I think we can get something done with little expense. I think the future use of phenothiazine on a continuous basis in cattle supplements is a distinct reality. I think we could look at it perhaps like vitamin A. Who would have thought 15 or 20 years ago that the farmer would expect vitamin A to be in the ration everyday? It had to be sold—every time a feed salesman sold a ton of feed he had to sell vitamin A! That is when many of us were really in the vitamin A business ourselves, selling it, on a day-to-day basis! That is not the case today, is it? It is in there, thirty-five, forty or fifty thousand units per head a day! When that farmer goes down in my country and buys a ton of feed, he expects vitamin A to be in there.

Due to the fantastic inexpense of two grams or one gram of phenothiazine, certainly we feel what might happen to the feed industry is that phenothiazine might be included on a continuous basis, and the farmer will expect it to be there!

In conclusion I would like you to consider a parasite control program involving more than just drenching or killing the bull that is down with something once or twice a year. There is a great deal more to it than that and I think that this time spent today by this group on this particular subject was well spent.