SODIUM FLUORIDE FOR REMOVING LARGE ROUNDWORMS FROM SWINE

Extension Circular 485

January 1946

Federal Cooperative Extension Service
Oregon State College
Corvallis

Cooperative Extension Work in Agriculture and Home Economics
Wm. A. Schoenfeld, Director
Oregon State College and United States Department of Agriculture Cooperating
Printed and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914
The purpose of this article is to make known to veterinarians, stockmen, and others the results of recent experiments on the use of sodium fluoride for removing large roundworms from swine.

Large Roundworms Injurious to Pigs

Large roundworms, or ascarids, are the commonest, largest, and most injurious worm parasites of swine. As a rule, young pigs are the victims of the heaviest infestations. The clinical condition, known as ascariasis, is the result of injuries by both adult and larval worms. The adults normally live in the small intestines of their hosts, and there is some risk, in heavy infestations, of obstruction in the alimentary tract on account of the bulk of the parasites. Ordinarily, however, the presence of many worms is less likely to cause obstruction than it is to bring about a condition characterized by poor utilization of feed, unsatisfactory gains, and digestive disturbances. The immature worms migrate extensively in the body, especially through the tissues of the lungs and liver and cause damage, some of which is permanent. Pneumonia, "thumps", and scarring of the liver are frequent results. It is not known how frequently large roundworms cause deaths of pigs, but observations indicate that the greatest losses result from unthriftiness, stunted growth, wasted feeds, and condemnations in inspected meat packing establishments.

Old Vermifuges Not Very Satisfactory Against Roundworms

Two drugs developed by the Bureau of Animal Industry have been commonly used in recent years for expelling ascarids from swine. These drugs are (1) oil of chenopodium (American wormseed oil), developed in 1918, and (2) phenothiazine, introduced 20 years later. Experience has shown that oil of chenopodium is about 75% effective for the removal of large roundworms, and that phenothiazine is less effective for this purpose, removing less than 50% of the roundworms. It seemed at first that phenothiazine would be a safer drug than oil of chenopodium, but experimental and field trials showed that this drug was about as toxic to swine as oil of chenopodium. The simplicity of administering phenothiazine in feed to a group of pigs, without preparatory fasting and without purgation with or following medication, probably led to wider use of this drug than would have been likely on grounds of efficacy and safety.

Sodium Fluoride Effective for Removing Roundworms

Search was made for a more suitable drug than oil of chenopodium or phenothiazine. After trials with numerous substances, the discovery was made that sodium fluoride offered promise of being more satisfactory from all important

points of view. Actually, this chemical, which is well known as a pest-control agent and louseicide, was tested for anthelmintic properties by workers in Australia in 1927-28, and was afterwards used in anthelmintic trials by several investigators but in all cases the chemical proved ineffective for the purposes under investigation. In 1936, however, a patent (U.S. Patent No. 2,027,967) was issued on an anthelmintic ration containing sodium fluoride for swine, but it contained no critical information on the action of the medication. The only detailed published data on the use and action of sodium fluoride as an anthelmintic for swine appeared during the past year (1945) in articles by parasitologists of this Bureau published in veterinary journals of this country. In addition the Bureau's annual report for the fiscal year 1944, published early in 1945, contained a summary of the principal results.

Briefly stated, sodium fluoride is more efficacious against ascarids than either phenothiazine or oil of chenopodium, its efficacy averaging about 95%; it appears to be as safe as either of these drugs; it compares favorably with phenothiazine in its ease of administration and possesses some particular advantages in this respect on account of its smaller bulk; and finally, it is cheaper and more readily available than either of the other drugs under discussion. Unfortunately, the use of sodium fluoride involves greater risk of accidental poisoning of man and animals than the use of either phenothiazine or oil of chenopodium. So far as can be determined from experimental studies, the careful use of the chemical for anthelmintic purposes is not likely to be injurious to domestic stock that may accidentally ingest medicated feeds.

How to Administer Sodium Fluoride to Swine

Under experimental conditions, the best treatment consisted in feeding pigs for one day on a mixture containing 1 part by weight of sodium fluoride (technical grade) and 99 parts by weight of dry ground feed.

The administration of the drug in capsules was not attempted, and there is no experience to warrant this method of treatment. In trials to date, administering the drug in feed at a concentration of 1% seemed to afford some natural protection against poisoning on account of a self-limited intake and because of the vomiting that followed occasional over-eating.

In lieu of fasting animals before treatment, a successful method consists in slightly underfeeding the animals on the day before they are to be treated. On the day of treatment, the medicated feed is given in the morning in such amounts as the animals normally consume in one day. On the next morning regular feed is mixed with whatever amount of medicated feed is left, if any, and customary feeding continued thereafter. If the animals requiring treatment are unaccustomed to dry, ground feed, they are maintained on nonmedicated feed for one or two days before being dosed.

Groups of from 2 to 30 animals have been treated successfully. Sodium fluoride is an intestinal irritant and the amount given in treatment appears to afford sufficient stimulus to cause effective elimination. No instances of intoxication have resulted on account of omission of specific purgation.
Growing pigs that are subjected to risks of heavy roundworm infestations may be expected to derive considerable benefit from two treatments before they reach marketable weight and age. Treatments at two or three months of age, and again at four to six months of age, should prove satisfactory.

How To Avoid Accidental Poisoning With Sodium Fluoride

Sodium fluoride is poisonous. The technical grade that is ordinarily available for civilian use is tinted to avoid risk of confusing it with salt, sugar, and other foods. Containers of sodium fluoride should be conspicuously labeled and stored out of reach of children, household pets, and individuals who are not familiar with the poisonous nature of the chemical.

Prevention of Parasitic Infestation is Important

Treatments for the removal of adult ascarids from the intestines of infected animals are only adjuncts to sound measures of control. Every hog raiser should be familiar with the so-called McLean County System of Swine Sanitation that was developed by investigators in this Bureau about 25 years ago. Recent researches moreover, have emphasized that much can be achieved by suitable feeding practices, notably through the maintenance of animals on appropriate diets of milk and certain milk products.