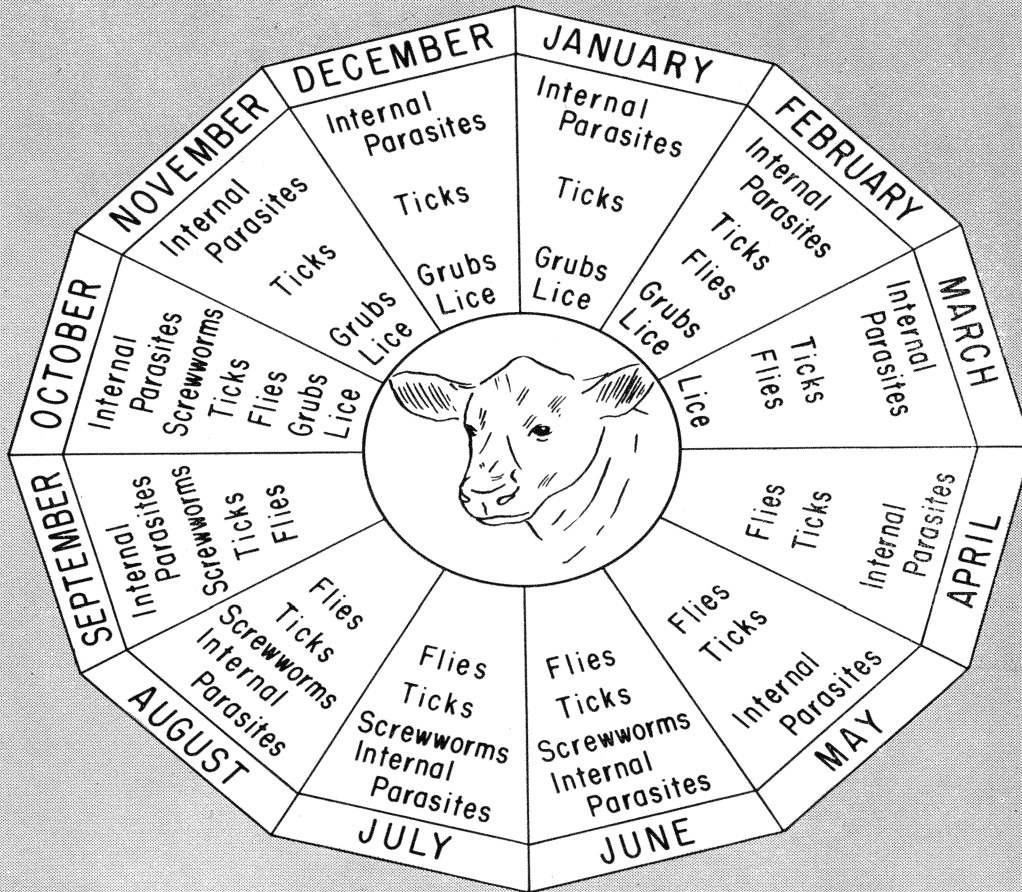


BEEF CATTLE PARASITE CONTROL

ADDS

MEAT
MILK
LEATHER
PROFIT



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The Importance of Parasite Control

No other single phase of agriculture concerns as broad a segment of Oklahoma's population as does livestock production. According to the 1954 Agricultural Census, 47 percent of the state's agricultural income was derived from the several types of livestock.

Livestock parasites and diseases may reduce our potential livestock production by as much as five to ten percent, according to various estimates. Since many species of cattle parasites cause considerable reduction in gains and also spread various diseases, their control is equally as important as any of the other improved practices considered essential for successful livestock production.

Livestock parasites are prevalent in all areas of the state and are of concern to everyone in any phase of livestock production.

Cattle Parasite Control

Newton Flora*

Extension Entomologist

Major reasons for the importance of flies to the beef cattle producer are the feeding habits of the biting species which cause discomfort and unrest in the herd resulting in reduced gains. Secondly, the flies' ability to transmit filth and disease may be of equal importance to their feeding habits.

House Flies

Because of their abundance and their habit of entering our dwellings, this is the most familiar species to everyone.

House flies have no biting mouth parts, but they may spread diseases such as dysentery, typhoid and diarrhea to human beings. They are also known to spread such diseases as pink eye and mastitis in livestock.

They are strong fliers and may be found feeding or crawling on food and filth on all parts of the farm.

The house fly reproduces rapidly. Each female may lay up to 900 eggs in her lifetime. A complete generation may take only 10 to 12 days, thus allowing for 14 to 18 generations each season.

Control

Chemical and mechanical means of fly control play a very important role in preventing large populations. There is no substitute, however, for a good sanitation program in the control of house flies.

A few of the suggested sanitation practices include keeping the house, barns, sheds, lots and surrounding area clean to reduce fly breeding places. All manure, straw, garbage or other waste materials should be moved at frequent intervals. If the manure cannot be spread regularly, it should be stored in fly-proof pits or boxes and the surface area covered with a thin layer of equal parts of calcium cyanamid and superphosphate or a low toxicity phosphate dust of one to five percent concentration may be used.

Windows and doors to the house, barn and other buildings should be screened.

***The Author Acknowledges Dr. D. E. Howell, Entomology Department Head, Oklahoma Agricultural Experiment Station, and Dr. W. E. Brock, Assistant Professor in Veterinary Pathology, who furnished valuable advice and consultation in the final preparation.**

Chemical Control

Residual Sprays

One percent malathion or diazinon should be used on walls of barns, sheds, fences and other places where flies are resting.

- To make a one percent spray use 32 pounds of 25 percent wettable powder to each 100 gallons of water or:
- Use 1 $\frac{3}{4}$ gallons of emulsion containing 5 pounds of toxicant to the gallon in each 100 gallons of water.
- 2.5 percent Chlordane or DDT may be used where resistance to these materials is not a problem.

Cover Spray on Stock

Any one of the following mixtures is effective when properly applied.

- Eight pounds DDT, 50 percent wettable powder, for each 100 gallons of water.
- $3\frac{1}{2}$ to 4 pounds BHC containing 10 to 12 percent gamma isomer for each 100 gallons of water or its equivalent.
- $1\frac{1}{2}$ pounds of 25 percent lindane wettable powder to 100 gallons of water.

Baits

Various types of commercial fly baits are available and should be used according to the manufacturer's directions.

Dry baits of Malathion or Diazinon used as two percent concentration in sugar mixtures give good results in fly control. To mix 25 pounds of this bait, use two pounds of 25 percent material in 23 pounds of sugar.

Use a can or jar with $\frac{1}{8}$ inch holes in the top as a sprinkler and spread at the rate of one or two ounces per 1,000 square feet of floor space. Apply the mixture daily until fly populations are reduced. When the flies are under control, space the applications every second or third day, or as needed.

Wet baits may be made from malathion, diazinon or Dipterex, however, they are not effective on dirt or wooden floors.

In preparing a wet bait use one ounce of 25 percent material in 10 to 12 gallons of water, plus 4 or 5 pounds of sugar. Two tablespoons or six teaspoons equal one fluid ounce.

Use a sprinkling can like those used for watering flowers to apply on concrete floors.

Horn Flies

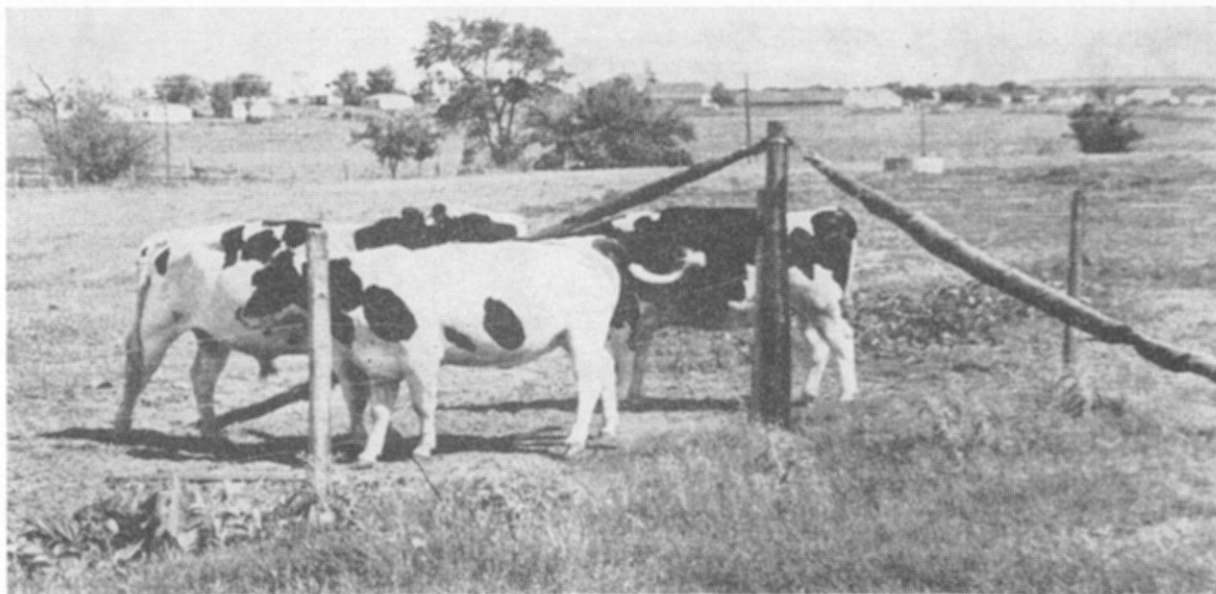
Horn flies are small grey flies about one-half the size of house flies and are found in all parts of the state. They are often seen clustering in large numbers on the top line of cattle throughout the fly season. They reproduce only in fresh droppings and may complete a generation every 10 to 14 days. Research data show that they may reduce gains as much as 30 to 50 pounds per head during the fly season. They have biting mouth parts and feed by piercing the skin and feeding on blood.

Control

Cover sprays as recommended for house flies are also effective in horn fly control.

Extensive tests at Oklahoma A&M College have also shown that 95 percent horn fly control can be attained by using a rubbing post. Plans for constructing the posts are available in the county agent's office.

Five percent DDT oil solution, five percent toxaphene or 0.5 percent dieldrin oil should be used on the rubbing post cable. Toxaphene and dieldrin are more stable than DDT at high temperatures.



Rubbing posts are effective in reducing several of the livestock parasites including lice.

Stable Flies

Stable flies are very nearly the size of house flies but differ in that they have biting mouth parts and usually rest with the head pointing up. They prefer the lower portions of the legs of animals. They do not enter buildings as readily as house flies, but prefer to rest on walls of buildings or in trees, shrubs and grass. In warm weather they may feed more than once during the day. A complete life cycle may take from three weeks to over a month, depending on weather conditions.

Control

A good sanitation program and the destruction of breeding places will lower stable fly populations.

Also residual sprays of one percent malathion or diazinon should be used on buildings, fences or other resting places.

Horse Flies

Horse flies are easily distinguished from the other types of flies by their larger size and distinct color markings. There are many species of horse flies found in the state. Compared to the other flies they are slow in reproduction. Some may complete two generations in one year, others may take two or three years to complete one generation. Their bites are extremely painful and they may transmit several livestock diseases.

Control

Horse flies are extremely difficult to control. Effective control measures have not been developed as yet. Temporary control may be obtained, however, by spraying the livestock every two or three days with an activated pyrethrin spray containing one percent pyrethrin, plus 10 percent piperonyl butoxide at the rate of one part of the concentrated mixture in 19 parts of water.

Cattle Lice

Four species of lice are found on cattle in Oklahoma. Three of these have piercing type mouth parts while the other one has biting and chewing mouth parts.

During the first warm days of spring lice populations begin declining and decline rapidly as hot weather approaches. During the first cool days in the fall, however, they begin a rapid increase in population and by midwinter may be present in damaging numbers.

Lice spend their entire life cycle on the animal and a new generation may develop every 20 to 30 days. Heavy populations can cause reduction in gains, unthrifty, rough coated animals and anemic conditions.

Control

A single insecticide application in the fall is usually sufficient for louse control, however, cattle should be checked regularly for reinfestation.

Eight pounds DDT 50 percent wettable powder or 3.5 to 4 pounds of 10 to 12 percent gamma isomer BHC or its equivalent should be used in each 100 gallons of water.

Rubbing posts are also effective in keeping lice populations to a minimum. Continue to charge rubbing posts during the fall and winter with a 5% DDT oil solution.

Ticks

Several species of ticks feed on cattle in Oklahoma. The most important of these is the winter tick, found on cattle in the fall, winter, and early spring months. The lone star or summer tick, is most numerous on cattle during the first warm days of spring, however. Ticks are blood sucking parasites and can cause damage by their feeding and disease transmission when they are present in large numbers.

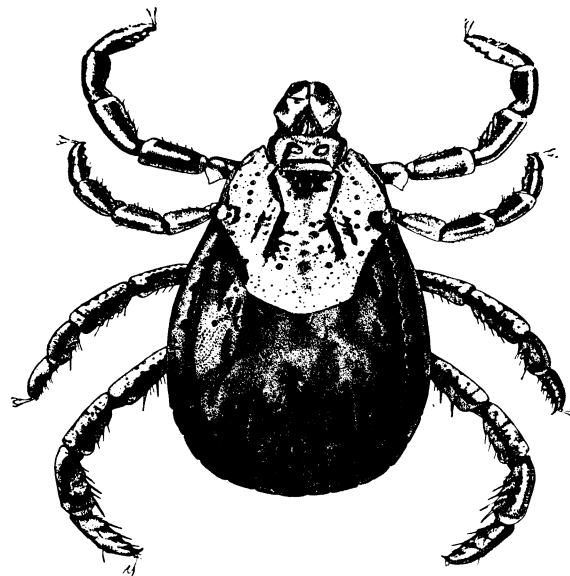
Control

There are two mixtures of toxaphene spray that are effective against ticks.

1. Use 0.5 percent toxaphene, which may be made by adding one gallon of emulsifiable concentrate containing four pounds toxicant to 100 gallons of water.

2. Use toxaphene 40 percent wettable powder at the rate of 10 pounds, or its equivalent to each 100 gallons of water.

If a combination spray is desired use eight pounds of 50 percent DDT wettable powder, plus one to two pounds of 10 to 12 percent gamma BHC in each 100 gallons of water.



The American dog tick, common species found on livestock.

Spinose Ear Tick

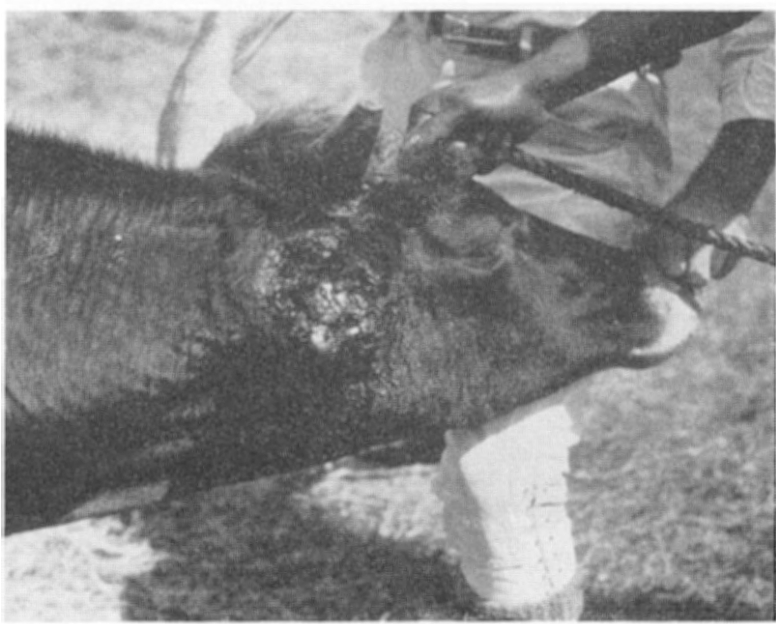
This species of tick feeds primarily on the inner folds of the ear, but in the case of large populations may also be found feeding around the outer edges of the ear. They cause irritation and itching, which may give rise to secondary infections or ulcerated conditions.

Treatment

Ear ticks cannot be controlled by ordinary spraying or dipping methods. Hand treating will be necessary for good results. Make a 2 percent lindane oil solution by mixing one part of 20 percent lindane to nine parts of *new low grade* motor oil. This material can be applied effectively from one of the pump type oil cans. Use a flexible spout on the can to prevent injury to the animal. Another method of applying the material is from a bottle. After treatment by either of these methods, roll the ear between the hands to break up the incrustrated wax, dirt, and tick masses in the ear. Approximately two ounces of material will be required for each animal. Applications of lindane will give protection against reinfection for periods of three to four weeks.

Screw-Worms

Not all maggot infestations are true screw-worms. All are undesirable, however, and every infestation of maggots should be treated with the same materials recommended for screw-worms.



Severe screw-worm infestation may result in total loss of the animal.

Open wounds are necessary before screw-worm flies will lay their eggs. This may be a large wound as a result of cattle hooking each other, or a fence wound, or it may be only a small lesion as a result of tick and fly bites.

Any good smear material containing lindane should be used for screw-worm control. EQ 335 or smear 62 is highly effective in and around the infested area. Retreatment may be necessary at weekly intervals.

Cattle Grubs

Spray

Use seven and one-half pounds of derris powder containing five percent rotenone in each 100 gallons of water. Apply over the back with a drive spray nozzle 12 to 18 inches from the animal's back. Use a spray pressure of not less than 300 pounds and no greater than 400 pounds.

Wash

Use 12 ounces of derris dust containing five percent rotenone, plus three tablespoonsful of soap flakes to each gallon of water. Wet the top line and brush with a stiff-bristled brush.

Dust

Mix one pound of five percent rotenone with two pounds of dusting sulfur or pyrohpyllite. Apply a powder with a shaker can or jar and rub the powder in the hair coat with a rotary motion of the finger tips.

At least three applications of material are required for best results. Dates of application are usually the first week in December, the first week in January, and the first week in February. Treating dates may vary as much as 30 days, however, depending on the date grubs first appear in the animal's back.

Internal Parasites

The problem of internal parasites of cattle has been recognized for years. Formerly, it was believed that the livestock in the southeastern part of Oklahoma suffered from much higher internal parasite infestations than did those in other areas of the state. More recently the research workers and veterinarians have come to the conclusion that cattle in all parts of the state may harbor internal parasites in damaging numbers.

The wash method of grub control is satisfactory for treating small herds.



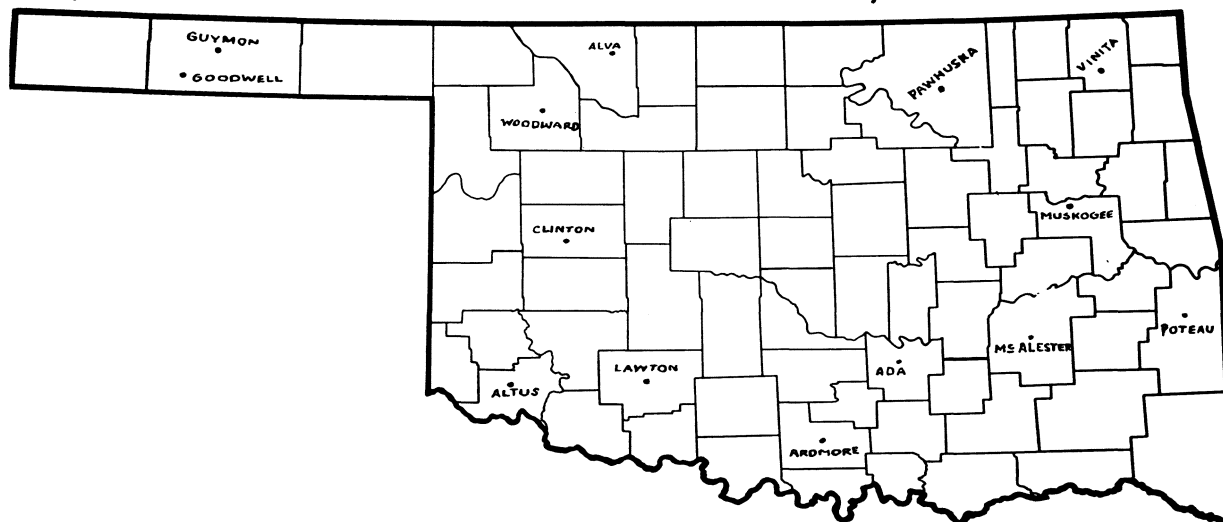
In 1947, a survey of the gastro-intestinal parasites of cattle was conducted by the Oklahoma Agricultural Experiment Station. Fourteen localities, as shown on the map, (figure 1) were selected as points for study. Material was collected at the time of slaughter. As nearly as possible, animals under 18 months of age were used for the study. There were 57 animals used in this research problem. The number from any given locality ranged from three to six head.

Table 1 shows the percent of animals infested by the primary species of stomach parasites in the various localities from which samples of material were taken for study.

Table I.—Stomach (Abomasal) Parasites

| Locality by Counties | Twisted Stomach Worms (H.C.) % | Medium Stomach Worms (Ostertagia) % | Small Stomach Worms (Trichostrongylus spp.) % |
|----------------------------|---|---|--|
| Osage | 66 | 83 | 66 |
| Pittsburg | 100 | 100 | 75 |
| Woodward | 100 | 100 | 75 |
| Woods-Major | 80 | 100 | 80 |
| Texas | 83 | 83 | 83 |
| Custer | 100 | 75 | 75 |
| Jackson | 100 | 75 | 75 |
| Comanche | 100 | 100 | 100 |
| Carter | 75 | 100 | 75 |
| Pontotoc | 75 | 100 | 75 |
| Muskogee | 80 | 100 | 100 |
| LeFlore | 100 | 100 | 66 |
| Craig | 100 | 100 | 75 |
| Average | 87 | 95 | 79 |

Figure I—Fourteen Localities Selected as Points for Study.



The results of this study substantiated the belief that the internal parasite problem of Oklahoma cattle is statewide.

Symptoms of Internal Parasite Infestations

Cattle that are kept in good condition with plenty of good feed and water may harbor moderate infestations of internal parasites without any apparent ill effects.

While animals may not be clinically ill with parasitism, weight gains and maximum feed usage is probably reduced as a result of parasites. Almost all veterinarians are equipped to make tests for internal parasite infestations.

When heavy infestations occur, or if cattle are not kept in thrifty condition, internal parasites may cause one or more of the following symptoms to appear:

- | | |
|----------------------------|--------------------------------|
| ● Failure to gain normally | ● "Pot Belly" |
| ● Rough hair coat | ● Lack of alertness |
| ● Stiff gait | ● Anemia |
| ● Coughing | ● Bloody or dark colored feces |
| ● Scours | ● Pale mucous membranes |
| ● "Bottle Jaw" | ● Loss of appetite |

Management Practices Favoring Control

Preventive practices may well be the most important factor in controlling worm parasites. In view of the similarity in the development of the free living stages of the most important internal parasites, preventive measures are usually applicable for most of the more important species.

Since young cattle are more susceptible than older cattle, management practices should be set up with the primary consideration of reducing the chances that calves and yearlings will become infested.

Overgrazed, or wet poorly drained pastures, as well as constant stocking of the same pasture are all conditions favoring the probability of increasing worm populations.

Where possible, pastures should be kept well drained and some system of rotation should be employed in grazing. Resting of pastures for a minimum of two months in the latter part of summer or early fall

will reduce the number of surviving larvae and is very beneficial in control of some species of internal parasites.

Pastures should not be overstocked, and young cattle should be kept separate from the older stock as much as possible.

Another important management practice of major importance is the diet of all animals subject to internal parasite infestation. Good feeds, including minerals and vitamins, apparently aid in the resistance of the cattle to many of the worm parasites.

Where possible, all calves under six months of age should be kept out of pastures known to be worm infested. During this period, they should be given extra attention to assure they will go on pasture in the best possible condition.

Plowing has proved to be beneficial in helping reduce the worm population. It is limited in its value due to the impossibility of using it in permanent pastures. It does have merit, however, in various row crop areas where pasture rotations can be included in the farm operation. Plowing of feed lots where numbers of cattle are kept for extended periods of time should not be overlooked.

Chemical Control

No one chemical can be recommended as effective against all the internal parasites. The material showing the most promise against the widest variety of the worm parasites is phenothiazine. It is not effective in lungworm control and has not proven successful against the tapeworms in the small intestines.

The use of chemical treatment should be considered only as a supplement to good management and sanitary practices discussed earlier, and should be adapted to the specific needs for chemical control in any given locality.

Treatment

One method of treatment generally practiced is the periodic drenching or treating with boluses during the year. This usually consists of treating just before animals go on pasture in the spring (March and April), a second treatment in mid-summer (July), and a third treatment in the fall when summer pasture is gone (September or October).

The recommended dosage is two ounces for mature cattle, one ounce for calves. The standard guide for dosage is 10 grams per 100 pounds of weight but not to exceed 60 grams regardless of the weight of the animal. (28.35 grams equal 1 ounce). Use smaller doses for animals in poor condition and repeat the treatment in three weeks to a month.

Using Phenothiazine By Low-Level Methods

Another method and one that has shown some promise in keeping worm populations in check, is the use of phenothiazine in low-level feeding methods. This practice provides for a daily intake of relatively small amounts of the drug either in feed mixtures or various mineral mixtures. Various research workers have shown that when animals are induced to take as much as two grams of phenothiazine per day, it reduced egg production of the female worms. The eggs produced were sterilized and only a very few hatched and developed infective larvae. This practice then becomes of major significance in reducing pasture contaminations.

One formula used by Dr. G. E. Cauthen at the Angelton, Texas Branch Station consisted of free choice feeding of the following mixture:

- 15% molasses (liquid)
- 6% Phenothiazine (powder)
- 16% salt
- 32% bonemeal
- 35% cottonseed oil meal

The molasses and phenothiazine should be mixed before adding the other ingredients to assure that all particles of the phenothiazine are coated with molasses.

This formula has also been tested by Dr. W. E. Brock of the Oklahoma Agricultural Experiment Station and found to be satisfactory for Oklahoma.

Other methods have consisted of using a cottonseed meal, salt mixture consisting of four pounds cottonseed meal to one pound of salt plus one gram of phenothiazine to each pound of the mixture. Consumption may be controlled by increasing or decreasing the amount of salt in the mixture.

Incorporating one gram of phenothiazine per pound of cake and feeding cake to adjust the phenothiazine intake has also shown some promise.

The degree of parasite control attained will depend on the quantity of the medicated mixture consumed. This method of treating cattle will not, within itself, give the desired control of the internal parasites, but it is an excellent supplement to the periodic dosage and management practices previously recommended.

PRECAUTIONS

The insecticides recommended in this manual are poisonous and should be handled with care. Follow all precautions and directions on container labels for maximum safety in using these materials. If high concentrations of insecticides are spilled on the skin or clothing, wash with water and change clothing immediately. Avoid repeated exposure to these chemicals.

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