

Problems Encountered in an Ovine Practice

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WITH THE INCREASE in the number of farm flocks, sheep have assumed an ever increasing role in veterinary practice. It has been said, and justly so, that a sheep is a difficult animal to treat. However, with the improvement in vaccines and pharmaceuticals, excellent results may be obtained if the original diagnosis is correct. With sheep, perhaps more than any other animal, a correct diagnosis is essential to successful treatment. A mistaken diagnosis and subsequent erroneous treatment may be disastrous.

No discussion of sheep diseases is complete without mention of the most commonly diagnosed condition, that of parasitism. As a general rule, lambs are the most overwormed animals that the veterinarian encounters in practice.

Stomach worm infestation is probably the most disastrous to the farm flock owner. Not only does it cause death to the animal it infests, but also may be responsible for weight loss and the problem of lack of milk at lambing time. We have seen several flocks of farm ewes in which the presence of *Hemonchus contortus* has caused the loss of many lambs due to the lack of lacteal secretion at lambing time.

The symptoms of stomach worm infestation include unthriftiness and extreme anemia, usually accompanied by an edematous condition in the head region

principally ventral to the mandible. At the time the animal is submitted for autopsy it is usually prostrate and found to be breathing shallowly and rapidly. Diagnosis is easily confirmed by demonstration of the parasites in the abomasum.

Fortunately, these parasites are relatively easy to eliminate from the animal body. Phenothiazine, copper sulfate, and tetrachlorethylene seem to be the drugs of choice. Phenothiazine is administered either as a drench or bolus at the rate of 12.5 gms. for the small lamb and 25 gms. for the larger or adult sheep. Copper sulfate is given as a drench usually combined with nicotine sulfate at the rate of 20 grs. of copper sulfate and 3 grs. of nicotine sulfate to adult animals and half this dosage to the younger animals. Tetrachlorethylene is usually administered by stomach tube giving 5 ml. to each animal. A combination of phenothiazine and lead arsenate is also used as a treatment for *Hemonchus* infestation.

Although this parasite is easily eliminated from the intestinal tract it is just as easily re-established in the animal. Since the life cycle does not include an intermediate host and due to the fact that an egg eliminated in the feces may become infective in a relatively short period of time, reinfestation is common. As yet no satisfactory method of treatment has been developed that will keep this parasite out of the animal. It is my opinion that nothing other than good sanitary procedures will ever make this possible. The addition of 1 lb. of phenothiazine to 15 lbs. of salt-mineral mixture is beneficial in keeping

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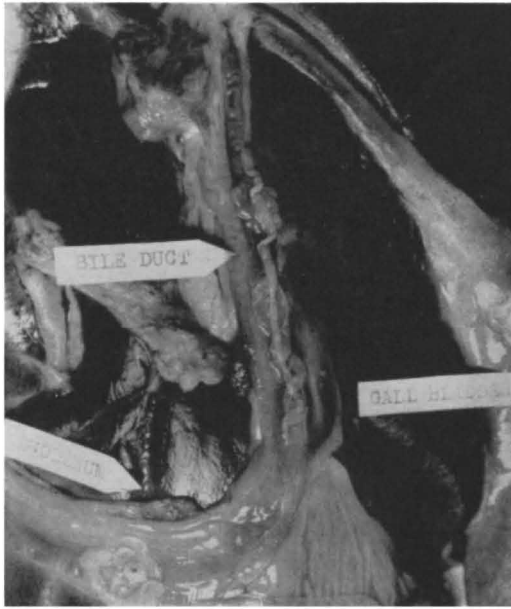


Fig. 1—*Thysanosoma Actionoides* in the common bile duct and duodenum.

the infestation at a relatively low level. Too many sheep men believe that this is the complete answer to the problem of stomach worms and fail to realize that it must be accompanied by a strict program of sanitation and pasture rotation.

Tapeworms do not, as a rule, cause death in sheep. They may, however, affect the development of younger animals and decrease the rate of gain in older animals. The two most common types of tapeworm are *Monezia expansa* (broad tapeworm) and *Thysanosoma actinoides* (fringed tapeworm) (Fig. 1). Many who feed sheep believe that the fringed tapeworm is a common cause of death in feeder lambs. The theory that is expounded by these men is rather unique. They believe that this worm normally exists in the intestine and as the lamb gains weight the internal temperature of this organ raises due to the increased amount of fat around the walls of the intestinal tract. This increase in the internal temperature causes the worm to seek a cooler place and consequently it migrates to the bile duct. There the parasite becomes lodged and plugs the duct so that no bile can escape into the intestinal tract. This bile then

backs into the blood stream and poisons the sheep. Although we have seen as many as 30 to 40 of these parasites in the common bile duct, none of the cases were accompanied by icterus. The only cases in which the fringed tapeworm was incriminated as the cause of death were those in which the gall bladder had ruptured as a result of severe infestation. In these cases peritonitis was the cause of death.

The observable symptoms of tapeworm infestation include unthriftiness and sometimes a diarrhea. Occasionally in severe infestations the proglottids may be observed in the feces. The symptoms usually attributed to the tapeworm are quite commonly found to be manifestations of nematode infestation.

We think that the best treatment for tapeworms is the commercial preparation, "teniatol," which contains di-phenthane 70. The administration of this drug is usually followed by immediate removal of both *M. expansa* and *T. Actinoides*.

Another type of parasite commonly found in the small intestines belongs to the family *Trichostrongylidae*. This includes the genera *Trichostrongylus*, *Nematodirus*, *Cooperia* and *Bunostomum*. Because of their extremely small size and the fact that they are closely adhered to the mucous membrane they are easily overlooked on autopsy. They are most easily recognized by making smears from the mucous membrane and examining under low power of the microscope. Scrapings from the mucous lining of the intestine may be made and placed in a shallow glass dish and examined with a black background. This type of background brings out the parasite and it may then be observed with the naked eye.

The outstanding symptoms of this type of infestation are severe diarrhea, emaciation, and unthriftiness. The animals lose weight rapidly, become weak and eventually prostrate as a result of the long continued and severe diarrhea.

This parasite may be difficult to control, but the use of copper sulfate-nicotine sulfate drench is usually recommended. Tetrachlorethylene has been used with varying results. Phenothiazine is effective

against *Trichostrongylus* but not against *Cooperia* nor *Nematodirus*.

The use of a drench containing both phenothiazine and lead arsenate is to be discouraged if a *Trichostrongylus* infestation is suspected. In one flock of 450 ewes which were drenched with this mixture 80 percent of the sheep developed a severe diarrhea. Eighty of these animals died. Of the remaining ewes, many were weak as a result of the diarrhea and the general condition of the flock was very poor. Autopsy of several of these ewes revealed a severe enteritis and the presence of nematodes. In such cases the nematodes apparently affect the intestinal wall to such an extent that the lead arsenate is easily absorbed, resulting in a lead arsenate poisoning. Careful examination of these sheep prior to drenching might have aided in avoiding this type of poisoning.

No discussion of parasitism is complete without mention of coccidiosis. This is a rather common condition among feeder lambs. The symptoms will vary with the intensity of the infection but usually are severe diarrhea accompanied by weakness, anemia, and rapid emaciation followed by prostration. There may or may not be blood in the feces. In some of the outbreaks observed in this section of the country, the feces were very fluid with no evidences of blood.

Diagnosis is usually made by demonstrating the presence of oocysts in the feces. However, in three separate outbreaks we were unable to find the oocysts in the feces. Autopsy of these lambs revealed emaciation, severe diarrhea and the presence of white areas in the intestines. Scrapings made from these areas revealed the presence of large numbers of oocysts.

Treatment of this condition is usually very discouraging. For the last two years we have been using sulfaquinoxaline with fair results. In some cases the administration of this drug in the drinking water stopped the spread of coccidiosis and cleared up those lambs that were not prostrate. Any lambs that are too weak to eat or drink are drenched with the drug, administering 1 oz. of the poultry



Fig. 2—Typical lesions of Contagious Ovine Ecthyma.

drinking water solution diluted with 3 oz. of water. The use of sodium sulfamethazine has also been found to be a beneficial treatment.

A virus disease often seen in feeder lambs is the condition commonly termed sore mouth or contagious ovine ecthyma (Fig. 2). The first symptoms are swollen lips covered with moist, brownish scabs. Later the scabs are firm and cracked and when removed leave a raw bleeding surface. It is at this stage that the secondary invaders become a problem. *Actinomyces necrophorus* seems to be the most common secondary invader. This infection may then spread through the mouth to the larynx and pharynx.

The course of this disease is usually short, lasting from two to three weeks. In uncomplicated cases there is very little weight loss and no mortality. In cases complicated by *A. necrophorus* severe weight loss and a few deaths may be observed.

In flocks where many animals become infected the use of ovine ecthyma vaccine is to be recommended. The vaccinating of a flock of infected lambs is followed by an almost complete cessation of the appearance of symptoms. Where only a few lambs are affected and the disease does not spread to others we have found that the removal of the heavy scabs and

the application of 1 percent potassium permanganate solution seems to be beneficial.

Sheep ranchers in this area believe that the use of potassium permanganate in the drinking water aids in the control and treatment of sore mouth. In cases where the secondary infection has spread to other parts of the head region the use of the sulfonamides has given good results.

The most important disease problem of feedlot lambs is enterotoxemia. Although it is commonly believed that this condition occurs only when lambs are in a feed lot receiving highly concentrated feed, we have found many cases in lambs on wheat pasture. In the fall of 1951, we observed three different flocks in which enterotoxemia became a problem although the lambs seemed to be on very poor feed. One flock of yearling ewes which were suffering from this condition was on a very poor type of wheat pasture and receiving supplemental feedings of poor quality alfalfa hay daily. Approximately 75 percent of these ewes were nursing small lambs. The existence of enterotoxemia in sheep of this type on poor feed leads one to believe that the type of feed probably has only a small place in the predisposition to this disease. The rate of gain and general condition of the sheep probably plays a more important role. Even though on poor feed these ewes were gaining weight and doing well.

Diagnosis of this condition is usually not difficult. Many times the history of the flock will be sufficient. The lambs seem to be gaining rapidly and doing very well. An occasional death is observed but nothing alarming. Suddenly several lambs are found dead on the bedground in the morning. Some lambs are found walking in circles nibbling at the ground. They become unable to walk on their front feet and eventually become prostrate, with the head thrown back and kicking continually. Death usually follows within a few hours.

Post mortem examination of these lambs may reveal rather confusing pathological changes. There is usually a hemorrhagic enteritis accompanied

occasionally by a hemorrhagic gastritis. Subserous hemorrhages are commonly found in the intestinal wall. There may also be subcutaneous hemorrhages over the sides and back of the lamb. Endocardial hemorrhages are frequently encountered. Intramuscular hemorrhages may be observed in the diaphragmatic wall. The pericardial sac usually contains a straw colored fluid that in many cases contains fibrinous material. Due to the rapid decomposition of the carcass in cases of enterotoxemia, the kidneys are quite pulpy. The liver is usually quite friable and badly decomposed as evidenced by a yellowish discoloration. Not uncommonly bubbles of gas may be noted under the liver capsule. The pulpy kidney and friable liver are best seen when the animal has been dead for at least three to four hours. If these lesions, pulpy kidney and friable, discolored liver are found, they may be considered almost pathognomonic.

Occasionally no lesions are observed. This usually occurs when the condition has been peracute and a fresh carcass is submitted for autopsy. Any of the above lesions may be seen alone or in combination with any of the others. Good judgement and the history will often lead to a correct diagnosis whereas pathological changes may be so variable as to be quite confusing.

Treatment of this condition was formerly thought impossible. However, with the development of *Clostridium perfringens* type D bacterin and antitoxin, control and treatment are now possible. With the advent of the vaccines the use of sulphur and soda in the salt or grain have become almost a thing of the past.

Antitoxin has been found useful as a cure for enterotoxemia if the animal is in the early stages. Doses of 20 to 50 ml. subcutaneously accompanied by the administration of 5 to 10 ml. intravenously have given amazing results. However, this treatment is useful only in the early stages of the disease. Treatment of animals prostrate from the effects of enterotoxemia has been disappointing, to say the least.

In flocks where the death loss has been

great, and seems to be on the increase, *Clostridium perfringens* type D antitoxin has been the product of choice. In the 31 flocks comprising approximately 25,000 lambs which have been vaccinated with this product we have not had a failure. The story has been the same in every case. Heavy losses were encountered the day before vaccination and in no case have we had any death loss attributable to enterotoxemia within three weeks after vaccination. However, the owner should be warned that this affords only a temporary protection and does not provide immunity for longer than 30 days.

Many farmers fattening lambs on wheat pasture in this section are now protecting their lambs from enterotoxemia by the use of *Clostridium perfringens* bacterin. We have vaccinated an average of thirty to forty thousand lambs every fall and the results have for the most part been excellent. The results have been very disappointing, however, when the bacterin was used on flocks of lambs in which death losses attributed to overeating disease had occurred. In several cases, at the insistence of the owner, flocks in which deaths had occurred were vaccinated with the bacterin. Instead of being beneficial the death losses seemed to increase only to taper off after ten to fourteen days. Because of this death loss, attributable either to the bacterin or the excessive handling of the sheep when they are vaccinated, it should be explained to the owner that it will take ten to fourteen days before the bacterin offers any appreciable amount of protection from enterotoxemia.

In problem flocks of this type, where the owner wants to use the bacterin, we have found that a change of feed followed by the administration of the bacterin four or five days after the sheep are taken off full feed gives excellent results without any additional mortality.

The method of vaccination will vary with personal preferences. We prefer to vaccinate the lambs in the wool-free area just posterior to the axillary space. The administration of the vaccine directly into the axillary space is followed by extreme lameness due to damage of the

brachial plexus by the formalin in the vaccine. Using a narrow chute with three or four good handlers, we have vaccinated as many as three to four thousand lambs in a day. A good automatic syringe equipped with a $\frac{1}{2}$ to $\frac{3}{4}$ in. 16 or 18 gauge needle enables the operator to do a rapid yet efficient job.

The most important and costly condition of the small farm flock is probably pregnancy disease. Heaviest losses are found in thin ewes and infrequently in ewes carrying a good covering of fat. Lack of exercise and a poor ration seem to be the predisposing factors to this disease.

The onset of the condition is usually gradual, and in the form of dullness, the affected ewe remaining behind as the flock goes out to pasture. As the condition progresses symptoms of motor irritation and deranged consciousness appear. Later the animal becomes prostrate and is unable to regain a standing position without assistance.

Treatment will vary with the different flocks, but forced exercise accompanied by a change in the ration usually are very efficient methods of stopping the disease. The addition of molasses to the feed seems to be beneficial. However, if the animal is prostrate when first observed, treatment is practically useless. The administration of dextrose intravenously or intraperitoneally seems to help if given early.

Since the expulsion of the lamb, or more commonly lambs, is frequently followed by a rapid recovery, we have been toying with the idea of performing a caesarean section on some of the more valuable breeding ewes in an attempt to save their lives. In some cases, pronounced incurable, we have been able to save the lambs by slaughtering the ewe and immediately removing the lambs by an incision into the uterus.

During the winter months of lambing, diarrhea of young lambs is not an uncommon condition. In several cases many lambs have been lost due to this condition. The predisposing factors to this type of lamb dysentery are unsanitary lambing pens, excessive intake of milk, and cold wet weather. The use of the sulfonamides,

particularly sulfaguanadine, sulfathiazole, sulfamethazine, and sulfamerazine, seem to give excellent results. In cases where the predisposing factor has been excessive intake of milk, a change in the diet of the ewes will eliminate the condition.

Another common winter problem is pneumonia. This condition is usually self-limiting and rarely a flock problem. Exposure to the cold weather, crowded barns, and unsanitary surroundings are usually found where pneumonia is a problem.

Symptoms include purulent nasal discharge, anorexia, extreme dyspnea and an elevated temperature. Post mortem examination reveals typical lesions of pneumonia, including adhesions, consolidation of the lung tissue, and hemorrhages throughout the lungs.

The use of penicillin and streptomycin with the sulfonamide of choice gives excellent results. We have had exceptional results using the antibiotics and sulfonamides and supplementing that treatment with the administration of anti-hemorrhagic septicemia serum or anti-corynebacterium-pasteurella serum. In cases where this disease is a flock problem the use of mixed bacterins has been beneficial.

One problem flock of young lambs when autopsied showed typical lesions of pneumonia: adhesions, hemorrhages in the lungs, consolidation of the lung tissue and petechiae on the heart, larynx and trachea. Without obtaining a complete history of the lambs—other than the fact that they refused to eat, breathed hard, and ran a fever—a diagnosis of mixed bacterial pneumonia was made and vaccination with a mixed bacterin was recommended. This treatment failed to stop the death loss. An examination of the environment under which these lambs were raised was made. The pens were clean and dry with no evidences of overcrowding or unsanitary conditions.

Observation of these lambs revealed an entirely different picture than we had been able to procure from post mortem examination alone. Several lambs were seen that seemed to be quite normal but suddenly started circling and became pro-

strate. The temperature of these lambs was considered normal when taken during one of these spells. The lambs recovered rapidly with no ill effects noted, however, they seemed to be blind during the attack. Closer observation disclosed the fact that several lambs were either partially or completely blind, a fact that had not been observed by the owner.

Autopsies of four lambs that had died recently were no more revealing than they had been before, as the same pathological lesions were noted. By close questioning of the owner we found that the ration consisted of ground milo, sorghum silage, soybean meal and cured sorghum stalks as roughage. A diagnosis of vitamin A deficiency and secondary pneumonia was made. It was suggested that that feed be supplemented with dehydrated alfalfa leaf meal at the rate of $\frac{1}{4}$ lb. per head per day and that the milo grain be replaced with ground yellow corn. This suggestion was followed, and almost immediate recovery of the entire flock resulted.

This case is included to point out that the incomplete history, complicated by the post mortem lesions, resulted in a mistaken diagnosis. If a complete history had been obtained, including the feeding ration, this condition could have been conquered almost immediately with but little loss of life. Since the diagnosis was incorrect, this farmer lost many lambs unnecessarily.

Since this experience we have been even more careful in obtaining all of the information, including the ration that the animals are receiving. Often when the problem seems to be impossible, a close examination of the ration will reveal discrepancies that, when corrected, will aid in alleviating the condition.

We have included here a practitioner's view of parasitism, sore mouth, enterotoxemia, pregnancy disease, diarrhea of lambs, and pneumonia. Mention has also been made of some individual cases which at the time were problems.

This was not meant to be a scientific discourse on sheep diseases, but merely a consolidation of ideas and problems that can and do occur when sheep become an integral part of a practice.