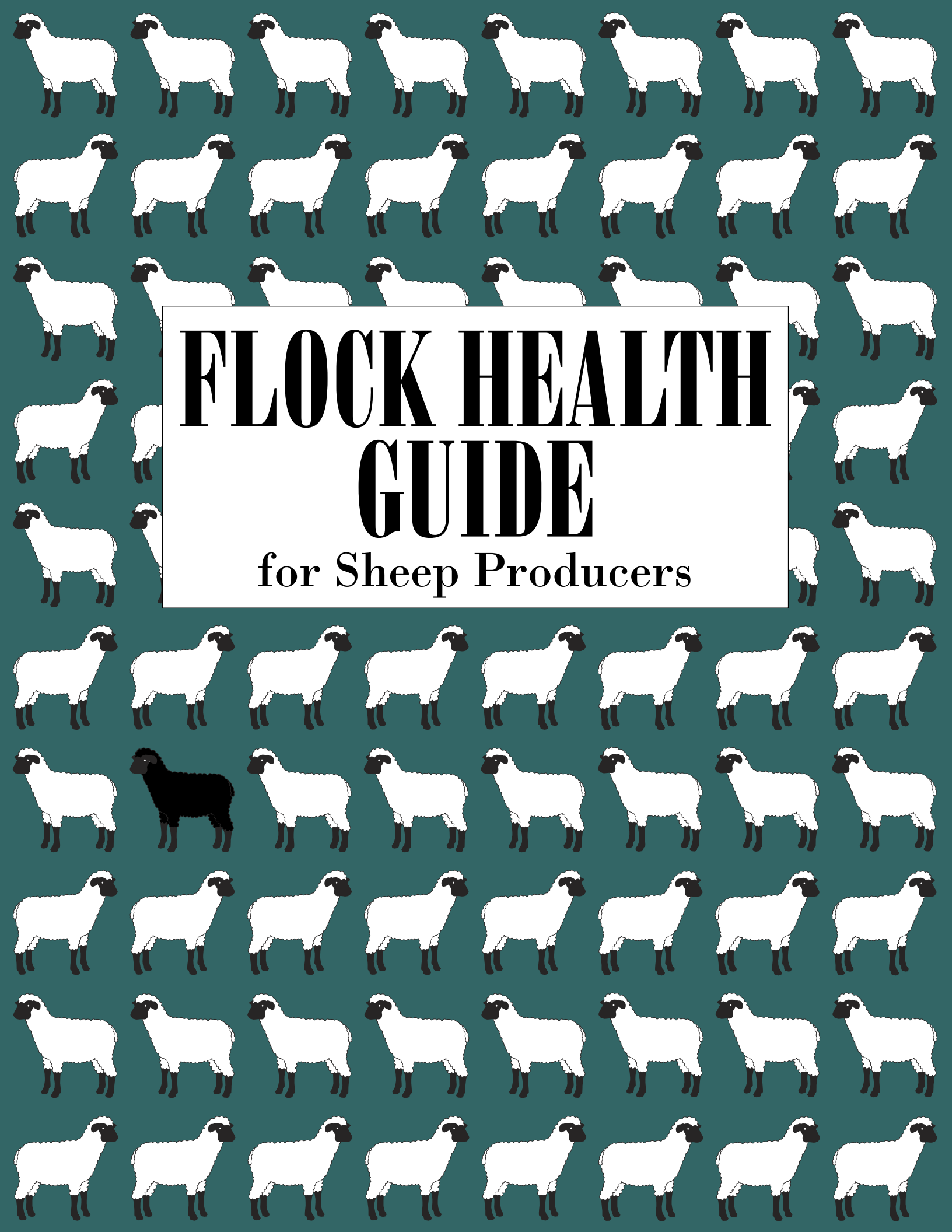

FLOCK HEALTH GUIDE

for Sheep Producers

FLOCK HEALTH GUIDE

FOR BC SHEEP PRODUCERS

Ministry of Agriculture, Food and Fisheries

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FLOCK HEALTH GUIDE

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Section 1 – General Management

INTRODUCTION

This Flock Health Guide deals principally with disease, its prevention, recognition and treatment. However, prevention cannot be overemphasized. Under conditions of good management and nutrition, the recognition and treatment of diseases, which result in economic loss and mortality, should not be of major concern.

The following discussion of management is not intended to be a comprehensive treatment of the topics included. More extensive information can be found in publications listed in the Bibliography.

ECONOMICS

The economics of any operation is a major factor to be considered regardless of the size.

With intensification of production some sheep producers have not employed proper management techniques to keep sheep healthy. Economic losses can occur due to death, poor condition of animals, poor feed conversion, drug and veterinary costs, carcass condemnation, and wasted feed.

Feeding on the ground can cause 30% loss of feed and this is the single biggest cost of production. Feed money can run as high as 50-60% of production costs. Obviously, wasting any feed is very expensive and may make the difference between a viable operation and a hopeless financial situation.

A small flock is usually hampered by a lower level of management because sheep are not the main source of income and therefore, not the main priority.

Input is minimal, mechanization is not feasible, facilities may not be completely adequate, and return per hour is poor. Of course this does not have to be the case if a good effort is made to do the best job with available resources. One just has to realize that a small flock operation is, through necessity, much more labor intensive than larger ones.

Flock operations are most profitable when: sheep are the major source of income on the farm, flock size is 1000-2000 ewes, increased labor can be handled with mechanization and when flocks are raised in a well established sheep area with professional help available.

The most economical way to operate is to provide adequate housing, good clean facilities, proper nutrition, and practical use of available pasture and land. Generally speaking, a good level of management produces a consistent profit, a fair level produces a profit sometimes, while a poor level produces no profit at all. Good management equals the best production levels at the least cost.

FACILITIES

Buildings should incorporate the following desirable characteristics:

- good space to avoid crowding
- protection from wind, rain, snow, heat
- good roof and walls-possibly insulated
- good ventilation (check with professionals)
- draught free
- place to store medication for safe quick access, near quarantine area
- quarantine pens
- storage away from feeding and watering areas
- good clean comfortable lambing area
- adequate area for treating sick animals
- easy to clean pens
- good lighting when needed

Outside corral areas should provide:

- good space to avoid crowding
- good safe corrals and yards
- safe runs, chutes, etc.
- good drainage in feeding and watering areas
- easily maintained and cleaned bunks
- type of bunks that animals cannot get into

- some areas that are covered from bad weather

Sheep should ideally be grouped according to age, stage of lactation, etc., to accommodate their different requirements at various stages of growth and production.

When designing buildings and corrals, consider the people who will be working in these areas. They will do a much better job if conditions for them are favorable. Areas, which are difficult to service, will end up not getting cleaned properly and act as a source of problems.

NUTRITION

Nutritional requirements for sheep are listed in the National Research Council (N.R.C.) literature (see Bibliography). They require water, energy, protein, minerals, salt and vitamins.

Energy is usually the biggest limiting factor in production. Sheep also need lots of protein; even if it is poor quality they can utilize it. They can use all types of forage if managed correctly.

Depending on the feeds available, animals may have to be fed vitamin, mineral & salt supplements. Vitamins A, D, E and K are required, especially Vitamin A. The rument microbes produce adequate B vitamins for normal use.

When feeding salt/mineral supplement it is best to use loose salt, not blocks, as this saves wear on the teeth and may add several extra years on to the productive life of ewes. Loose salt/mineral mix should be provided in a feeder such as that shown in Figure1.2.

Fast changes of feed can cause serious digestive upsets and lower resistance to disease. Feeds should be switched over a 1-2 week period gradually introducing more and more of the new feed while decreasing the old. This allows the animal's digestive system a chance to adjust comfortably.

Sheep need a good clean water source not too far from the feeding area. Long trips between feeding and watering should be avoided. They will not drink adequate water if the quality is poor. They will eat some snow but usually not enough for production needs. Everything should be planned around the water supply for good results. Sheep generally need at least 2 times their dry feed intake in water. If on a high protein diet, high mineral or salt intake, if temperatures are above 20 C, if ewes are in late gestation or lactating they will require an unlimited water supply. Cold temperature will cause decreased water needs unless they are on a high protein diet.

Shaded water is preferred on hot days while heated water is preferred in the winter. Cold water will cause a higher feed requirement. Adequately watered sheep are less likely to stray into water holes and sloughs, which may contain poisonous plants and other trouble areas. Sick sheep will often drink even though they fail to eat.

Mass feeding and watering generally favors the strong and inhibits the weak. This can be partly avoided by grouping animals according to their age, size, stage of gestation, stage of lactation, etc. On the other hand, mass feeding and watering decreases the labor input and stress of handling animals.

HYGIENE

In planning a sheep operation of any kind, sanitation and disease prevention should be primary considerations.

Intensive production leads to higher levels of animal wastes and parasite buildup. Poor sanitary conditions and infective agents accumulate rapidly if not taken into account by the manager. Many diseases may be transmitted through contaminated water and feed sources.

In dry lots, both water and feed should be provided in bunks up off the ground so that animals cannot contaminate the feeding and watering facilities. It has been accepted practice in some flocks to feed on the ground and on snow. Infected ewes can easily contaminate feed in this manner and this is a major means of spreading infections. Poor hygiene levels lead directly to high lamb and ewe losses.

Problem areas such as stagnant water, poorly drained land, and ponds can act as a breeding place for internal parasites, insects, flies, gnats, etc. These can be avoided by fencing them off properly and providing adequate drainage.

Another common source of infection is shearing equipment. It is advisable to keep your own equipment which you can clean and disinfect yourself. It should always be disinfected between jobs. Shearing cuts on animals should also be disinfected right away and a fly repellant used on the wounds. Animals should be placed in a clean area after shearing so that any small cuts will not become infected.

Sick animals should be isolated in a quarantine area to avoid further spread of disease. They can be treated more easily and more often in this way.

When bringing in new animals from outside the flock, isolate them for 3-4 weeks and longer if footrot is suspected. Inspect all feet, trim and disinfect them, and deworm all new animals before adding to the main flock. If a problem starts to surface seek professional help before major problems result. Accurate diagnosis is critical to proper treatment of disease problems.

There should be a properly maintained disposal area on the farm for dead animals and aborted feti. This can consist of a burning pit or animals can be buried and covered with lime. This area should be fenced off properly to keep dogs and other animals out and it should be well drained to prevent any run-off into adjacent ground.

Every effort should be made to determine the exact cause of sheep losses. Proper diagnosis and accurate records of the conditions causing death may help to save other sheep and lambs. Causes of death can be summarized at the end of the year and the major health problems of the flock identified.

PASTURE MANAGEMENT

Sheep tend to stay in small groups and do things as a flock naturally. They prefer to face the wind when grazing and will travel great distances facing this way. They can be very reluctant to move the other way.

It is advisable to keep them spread out in hot weather to avoid crowding together and suffering from too much heat.

Proper pasture management consists of proper: plants and fertilizers, rotating fields if possible, restricted grazing times to stretch out grazing seasons in certain fields, allowing young animals to graze on pasture at the best time, then older ones as the pasture gets poorer, and utilizing all available land by moving water or salt around to draw the sheep into every area.

Alternate grazing with goats or cows can help prevent a buildup of pasture parasites. Electric fences can be very helpful in preventing preferential grazing, resulting in feed wastage.

Early weaning of lambs can accomplish the following:

- ewes make better use of pasture
- severe parasite load in lambs avoided
- less predator losses of lambs
- the flock moves around better if it is all lambs or all ewes
- ewes can be culled or re-bred earlier

LAMB HEALTH

As far as replacement ewe lambs are concerned it is best to raise your own stock and maintain a closed herd. If you must buy from a breeder, make sure you deal with a reputable one who keeps good records. This way you cannot only check the flock and farm conditions, but you can also check all health records before buying.

Purchased lambs should be rested, given fresh water, lightly fed, and allowed to relax before handling or sorting them. After allowing them to settle down for a couple of days, while isolated away from the rest of the flock, they can be treated for parasites, vaccinated, sheared, etc.

Sheep are quite susceptible to stresses such as: weather, shipping, shearing, moving over long distances, and treating with drugs. Any stresses before shipping can be very harmful. Proper handling of lambs just prior to shipping can reduce death loss during and after shipment.

They should be rested and have water and feed restricted to small amounts, but not withheld. Don’t load wet lambs as pneumonia problems will occur. Preferably they should be preconditioned by de-worming and vaccinating them 2 weeks prior to shipping. If shipping in warm weather shear them 3-4 weeks before. Make sure that the truck is not open or draughty and that the exhaust fumes do not have a chance to get into the back.

Lambs being moved from pasture to feedlots should be on a small amount of grain 2-3 weeks prior to the move.

Section 2 – Disease Classifications

DISEASE

Disease can be defined as any state of bodily condition other than normal good health.

DISEASES CLASSIFIED
ACCORDING TO CLINICAL SIGNS

Clinical: Clinical disease is present when many or all of the usual symptoms of a certain disease are seen. These signs will vary with different diseases but in all cases clinical disease involves the complete course of the sickness.

Subclinical: (less than clinical)
Subclinical disease can be present at any time without being noticed because the signs may be very slight. In this situation the disease has a chance to spread because it is hidden from normal detection.

Some animals in a flock can act as carriers of disease by harboring a mild subclinical infection which spreads to the other animals before it is detected. Once the disease has spread to enough animals the obvious clinical condition becomes apparent.

DISEASES CLASSIFIED
ACCORDING TO RATE OF ONSET

Acute: Acute disease refers to one, which develops very abruptly and usually is quite severe. We are talking in terms of hours or days here.

Chronic: Chronic disease refers to one, which develops over a longer period of time and is usually not as severe. We are talking in terms of weeks or months here, sometimes even years.

DISEASES CLASSIFIED
ACCORDING TO DEGREE OF INVOLVEMENT

Local: Local disease affects only one small part of the body and does not readily spread to other areas.

Systemic: Systemic disease affects a large part of the body and sometimes the whole body, including all organs.

DISEASES CLASSIFIED
ACCORDING TO BODY SYSTEMS

Integumentary: Diseases of the skin, hooves and horns.

Central Nervous System (C.N.S.): Diseases of the brain and spinal cord.

Circulatory: Diseases affecting the blood, heart, the blood vessels, the lymphatic system and sometimes, the surrounding tissue.

Respiratory: Diseases of the nostrils, throat and the lungs.

Gastrointestinal Tract (G.I.T.): Disease of the mouth, throat, stomach, intestines, rectum and anus.

Reproductive Tract : Diseases of the sex organs.

Urinary Tract: Diseases of the kidneys, ureters, bladder and urethra.

Musculoskeletal: Diseases of the muscles and the bones. These involve the animal's ability to move about.

DISEASES CLASSIFIED
ACCORDING TO CAUSE

Nutritional: Nutritional diseases are those which are a great result of too little or too much intake of energy, protein, water, vitamins, and /or minerals. It has been suggested that if every animal were to get proper nutrition we could control and possibly eliminate most disease problems.

Metabolic: Metabolic diseases are those which are a result of the body not functioning properly. These are internal chemical upsets, which are not due to infections. Treatment is aimed at restoring the normal chemical balance.

Stress Related:

These diseases are a result of the animal's natural resistance being lowered by physical and emotional pressures. Disease occurs when resistance is at a level where the animal is no longer capable of fighting off germs which are trying to force their way into the body. Any kind of activity which causes animals to get excited and nervous and to run excessively or neglect to eat, drink and rest properly, will lower their resistance to disease. Just about every kind of handling could be considered a stress to some degree, but the key word here is, excessive.

Poisonous:

These diseases are a result of the animals eating poisonous plants or drinking chemicals. Plant poisoning usually happens when animals are grazed on poor pasture and are tempted to seek out weeds and plants that they would normally leave alone. Many of these plants are the first to produce green shoots in the spring and this may be too enticing for the animals. Overgrazing allows weeds and poisonous plants to overpopulate an area.

Animals will sometimes drink or eat chemicals from footbaths, fertilized fields, junk piles, oil dumps, or antifreeze containers. Sometimes chemicals can be improperly mixed into feeds leaving lumps of concentrated material or supplements can simply be overfed at toxic levels.

Another form of poisoning is called photosensitivity. In this situation certain plants are eaten that cause a buildup of chemicals in the body, which are extremely sensitive to rays of the sun. Animals which have eaten these plants will develop serious burns and sores, sometimes even losing areas of skin when exposed to sunlight. The sore areas usually develop in lightly colored or unpigmented areas of the body such as tips of the ears, top of head, back regions, around the anus, vagina, feet and teats. This condition can be quite severe and cause deaths in the flock if not diagnosed and treated properly.

Parasitic: Parasitic diseases are caused by larger organisms, some of which can be seen with the naked eye. They can cause problems internally as well as externally. Internal problems are caused by tapeworms, roundworms, flukes and protozoa (coccidia). External problems are caused by mites, lice, keds and other ticks, flies, bots, etc.

Some of these organisms cause disease by directly robbing the animal of nutrition, while others are blood suckers. Many of them cause problems mainly by bothering the animal to the point where it spends all of its time trying to get rid of the pest and does not look after itself or eat properly. Some of them also introduce germ infections when they bite.

CLASSIFICATION	EXAMPLES
<u>Clinical Signs</u>	
Clinical	Pinkeye
Subclinical	Gastrointestinal roundworms
<u>Speed of Occurrence</u>	
Acute	Enterotoxemia
Chronic	Chronic progressive pneumonia
<u>Degree of Involvement</u>	
Local	Epididymitis
Systemic	Milk Fever
<u>Body systems</u>	
Integumentary	Footrot
CNS	Polioencephalomalacia
Circulatory	White muscle disease (heart)
Respiratory	Pulmonary adenomatosis
GIT	Pasture bloat
Reproductive	Vibriosis
Urinary	Water belly
Musculoskeletal	Erysipelothritic polyarthritis
<u>Cause</u>	
Nutritional	Swayback (copper deficiency)
Metabolic	Pregnancy toxemia
Stress	Pneumonia (shipping fever)
Poisonous	Chronic copper poisoning
Parasitic	Liver flukes
Infectious	Salmonella dysentery
Congenital	Entropion

Table 2.1: Examples of common sheep diseases classified.

It is probably impossible to raise animals without raising some parasites at the same time. Maintaining the parasite load at a minimal level, so that losses and disease are as low as possible, it the main goal. In most cases attempting to completely rid animals of all parasites is not economically feasible, so an acceptable compromise is worked out.

Infectious: Infectious diseases are caused by tiny organisms which invade the body with the ability to cause damage. The organisms can be viruses, bacteria, fungi or protozoa.

For ease of writing we will group these and all similar organisms together and refer to them collectively as “germs”.

All infectious diseases have an incubation period. This is the period between the time that germs enter the body and the time that the actual signs of the sickness are seen (clinical diseases). It usually lasts for one or two weeks.

Animals may be highly contagious during this period, contagious diseases being those which readily spread from one animal to another causing a flock problem. All contagious diseases are infectious although some infections do not spread to other animals and are therefore not contagious.

Most animals with an infectious disease will have a fever at some time, while non-infectious conditions usually do not cause a significant rise in temperature. The use of a rectal thermometer is one very useful method to help differentiate between the two conditions so that appropriate therapy can be used.

Congenital: Congenital diseases occur when there is improper development of the lamb in the womb. Infections, poor nutrition, and poisonous substances eaten by the pregnant ewe can cause these. Also, many are caused by inheritance of undesirable genes. These diseases can be very difficult to control unless a strict breeding and culling program is followed.

Section 3 - Disease Prevention and Treatment

INTRODUCTION

Diseases caused by stress, nutritional imbalances, metabolic upset, poisons and inherited traits can be prevented or corrected by sound management techniques. Namely, by; minimizing excessive pressures on animals, feed properly balanced complete rations, maintaining normal chemical balances in the body, keeping animals away from poor pasture and danger zones, and following carefully planned breeding and culling programs.

Antibiotics, vaccines, antiserums, antitoxins, toxoids, anthelmintics, cocidiostats and insecticides will not work in the above situations. These drugs should be reserved for treating infectious and parasitic diseases only. The latter two classes of disease are by far the most difficult to prevent and control.

Any herd management program should stress prevention as opposed to treating disease when it appears. An ounce of prevention is worth much more than any amount of treatment.

DRUGS

A word of caution about drugs. Before using them, ask for advice. If literature is not available to read, ask a qualified veterinarian for help. When printed material is available, read the manufacturer's labels and package inserts. These will tell you what the product is, how strong it is, what it will and will not do, what side effects may occur, how much to give, when to give it and when not to, how to give it, how to store it, when it expires, and how long it takes for the drug to clear out of an animal's body before shipping to market (drug withdrawal time).

All drugs have a limited shelf life and an expiry date. After this date they are not safe and should be discarded. This should be checked on all bottles and packages especially when purchasing drugs in large quantities.

Different companies use different names for the same drug on the market. These are called "brand names". They can be confusing to say the least, so always look for the actual chemical or generic name of the drug on the package. It is listed as the active ingredient in smaller print. This will not vary no matter what the brand name is, so you can always rely on it.

Before giving any drugs always take a second to read the label on the package, no matter how familiar you are with the product. This simple double check may help you avoid giving the wrong drug, and may even help save an animal's life sometime.

As a final note, remember that no drug will do a good job unless it is used at the right time, at the right dose and in the right set of circumstances.

Careless use of drugs will lead to resistance in the germ population and cause a multitude of problems. Drugs plus good management together will be successful.

Vaccines

Vaccines are made by either killing the germ (killed vaccine or baterin) or treating the germs in such a way that they are still alive but cannot cause an infection (live attenuated). In any case, the basic idea for using a vaccine is to fool the body's immune system (natural resistance) into thinking that a real infection is happening, even though it is not. The animal then builds up protection (antibodies) against this.

Antibodies are chemicals, which are produced whenever a foreign object (anything that normally does not belong) enters the body. This process takes about 1-2 weeks to occur before adequate levels are built up for good protection. The animal retains a high level of antibodies for a variable time after this happens depending on the type of germs involved. Protection may last months or even years in some cases. Eventually it declines so a booster shot is needed every now and then to build up the reserves for future use.

If the real disease germs attempt to invade the body of a vaccinated animal the antibodies act like a wall of protection to destroy them or at least slow them down. Hence, by using vaccines we can build up the body's defenses before

actual disease germs can cause trouble, thereby preventing disease. Prevention is the key word here.

Protection can be provided in two basic ways. One is to be given immunity from the mother (passive maternal antibodies) via colostrum and in some animals across the membranes in the womb. In this case the mother has been vaccinated previously to build up her reserves of antibodies. She passes some of them on to her young and they end up with a supply of ready made protection, which lasts for a few weeks. Once the mother's antibodies have worn off the young animal must start producing its own natural protection. Now it can be vaccinated to stimulate its own active immunity. In summary then, when an animal produces its own antibodies it is building active immunity, when an animal receives antibodies from another source it has passive immunity.

It is extremely important that the young animal is vaccinated at the correct time, otherwise it will be left without any of the mother's antibodies and yet still not have any of its own. At this point the young animal is very susceptible to infection. A veterinarian should be consulted about the correct procedure to follow or refer to the vaccine company's literature.

Vaccines are really the best way we have of fighting viral diseases, because we do not have any practical drugs to treat virus infections. Once a viral disease is present we usually have to let it run its course and provide nursing support for the animal to avoid a secondary bacterial problem. Vaccines are an excellent example of how a strong prevention program can be superior to a more costly treatment schedule.

Antiserums & Antitoxins

Antiserums are serum samples taken from the blood of previously vaccinated or infected animals. The serum contains antibodies, which can be given to sick animals to fight off infections or toxins. This method works immediately because the animal is receiving a ready made supply of antibodies. The protection usually lasts a shorter period of time than with vaccines but affords enough help to get the animal out of trouble. This is a form of passive immunity and is also a form of treatment to be used when disease is already present.

Toxoids

Toxoids are a type of vaccine made from toxins (germ poisons) which have been treated to destroy their ability to poison the body, but they still stimulate the production of antioxins (a type of antibody). This is a long acting form of protection against bacterial toxins, which may accumulate during certain infections.

Antibacterials
(Antibiotics and Sulphonamides)

Antibiotic substances are manufactured by some bacteria to fight off others, which may compete for the same space or food. We can culture the bacteria that produce antibiotics and harvest the chemicals. We can also duplicate these drugs by synthesis in the laboratory changing the original structure slightly to get a stronger and wider range of activity.

Sulphonamides are another class of antibacterials. They were discovered while chemists were producing dyes for colouring wool and silk.

These chemicals either slow down the growth of bacteria or kill them. They are used as a treatment to control bacterial disease causing organisms. They only last for a matter of hours in the body so more must be given on a regular basis until an infection is completely eliminated. The key word here is treatment.

Some antibacterials, such as penicillin, have what is called a narrow spectrum of activity. This means that the drugs will only be useful against very few types of bacteria. In other words, they would work against specific infections or maybe even just one infection. On the other hand, some of them, such as the tetracycline's, have a broad spectrum of activity, which means that they are useful against many different types of bacteria and occasionally against other germs.

Generally speaking external infections are caused by organisms which can be controlled by

narrow spectrum antibacterials. Internal infections are usually caused by organisms which must be controlled with broad spectrum antibacterials. As a rule of thumb, until proper identification of the organisms can be made, a broad spectrum drug can be used to try and cover all bases. This practice is not ideal because it can be wasteful and sometimes even harmful, but until a certain organism is known to be causing the infection, a more specific chemical cannot be used. The broad spectrum one is probably the best to use to at least get some treatment started while samples are cultured and checked for drug sensitivity at a laboratory.

Anthelminitics

These are a variety of drugs used to treat parasites such as roundworms, tapeworms and flukes. They are not totally effective in parasite control unless a good level of management is also present. Drugs alone will not control parasites. A good understanding of life cycles and how parasites spread is required. Professional advice may be needed here as some of these can be hazardous to use.

Coccidiostats

There are drugs used specifically to control and eliminate coccidial infections. The level of management, effectiveness of the drug, price, safety, availability of the drug, etc., will dictate which one to use here.

Insecticides

These drugs are used to treat external infestations due to parasites. A variety of powders, dips, pour on liquids, oils, and pastes are on the market. Some of these are very dangerous to use so great care must be exercised. They can be harmful to animals and to people if proper clothing and protection is not worn. Follow manufacturer's warnings and advice carefully.

ROUTES OF DRUG ADMINISTRATION

Preferably, injection sites should be cleaned with alcohol or a good disinfectant before giving shots. The needle should be cleaned between shots for each animal, especially when a multiple dose gun is used. If only a small number of animals are being injected, a clean separate needle should be used for each one. Above all, if there is *any* doubt about using the following methods, professional veterinary help should be sought. Don't take any unnecessary chances.

Oral:

Drugs are given via the mouth. This may mean medicated feed or water, large pills called boluses, or drenching the animal with liquid preparations.

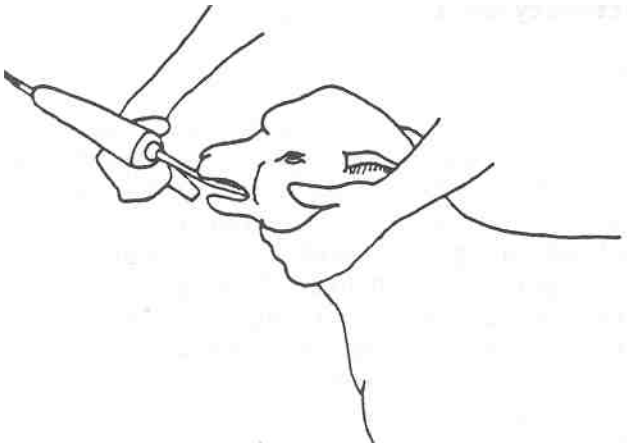

Figure 3.3: Drenching

Subcutaneous (S.C.):
Sub = under; Cutaneous = skin

The injection is given just under the skin. A fold of skin is pinched between the thumb and fingers, then the needle is placed at the base of the fold. The neck area or loose skin behind the forelimb is used.

Intramuscular (I.M.):
Intra = in; muscular = muscle

The injection is given deep into a large muscle in the hind end, shoulder or neck. The latter is preferred in lambs due to the risk of spoiling prime meat in the other areas.

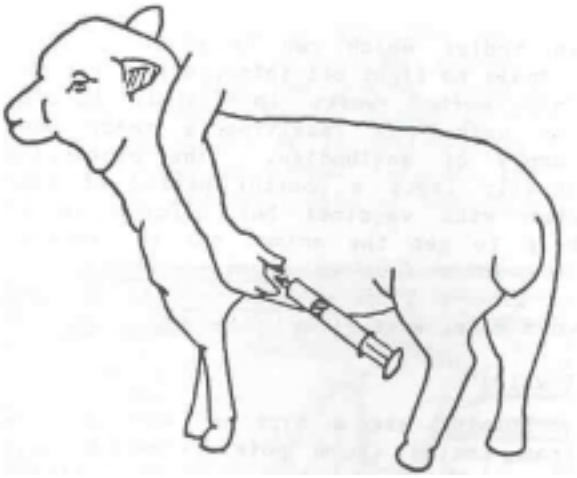

Figure 3.4: Subcutaneous injection

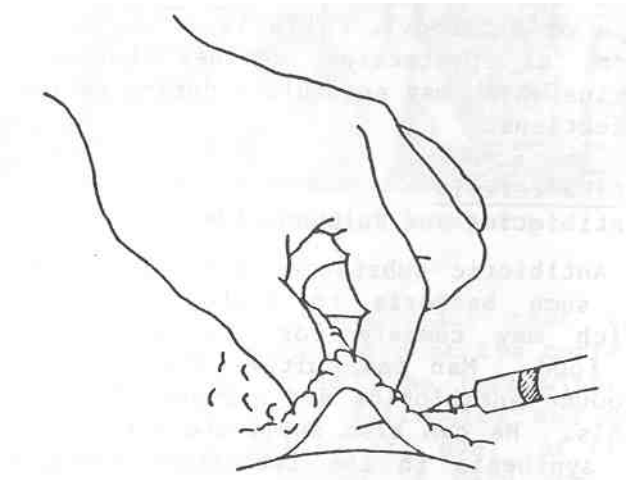

Figure 3.5: Needle is placed at the base of skin fold

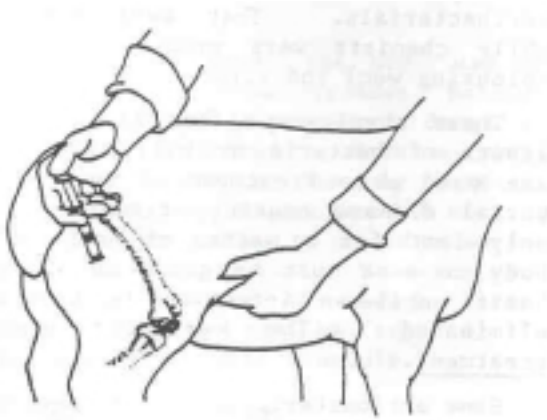

Figure 3.6: Intramuscular injection

Note! When giving subcutaneous (S.C.) or intramuscular (I.M.) injections care should be taken to make sure that the drug is not given in a vein. The drugs given via these routes are designed for that purpose only and if given intravenously (I.V.) could possibly kill the animal. Once the needle is in place properly, the plunger of the syringe should be pulled back slightly, to cause a suction inside. If blood squirts into the syringe and colours the contents red, the end of the needle is in a vein and should be moved out just a little, ¼ of an inch is usually sufficient, then give the injection.

Intravenous (I.V.):

The injection is given directly into a large vein. Usually the jugular vein in the neck is used. Pressure is applied to the vein below the site where the injection is to be given so that it swells up and is easier to see. The needle is introduced into the vein gently, and once inside the wall of the vessel, the plunger is pulled back slightly to cause a suction inside the syringe. If the needle is in the vein properly, blood will squirt easily into the syringe and colour the contents red. The injection may then be given. If blood does not squirt into the syringe when suction is applied the needle is not inside the vein. It must be moved slightly and checked again before giving the shot.

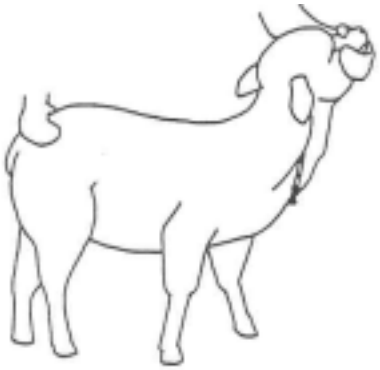

Figure 3.7: Jugular Intravenous Injection

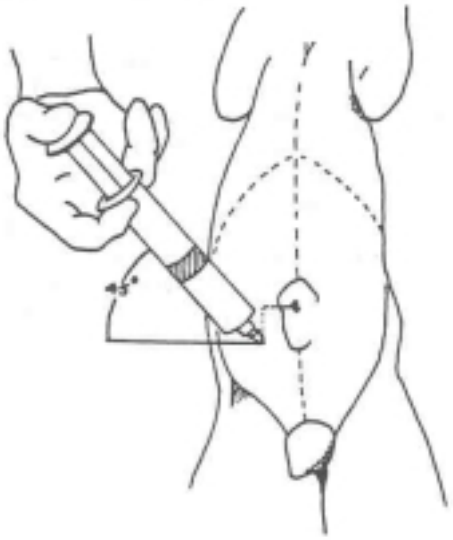

Figure 3.8: Intraperitoneal injection in a young lamb.

Intrauterine (I.U.):
intra = in; uterine = uterus (womb)

This usually involves depositing medication inside the uterus. Cleanliness is very important so that dirt is not introduced. Liquid medication can be pumped in or boluses can be placed in the uterus.

Intramammary:
intra = in; mammary = udder

Medication is inserted into the teat canal and up into the udder after a thorough cleaning with alcohol or a good disinfectant.

Intraperitoneal (I.P.):
intra = in; peritoneal = abdominal cavity

Medication is injected into the abdominal cavity. This method involves a risk of possible serious internal side effects so should be avoided except in a life or death situation.

Section 4 – Guide to Diseases of Sheep

INTRODUCTION

This section is designed to help in identifying specific flock health problems. It is not meant to be read through, but only to be referred to in conjunction with the following tables.

Unfortunately, diseases often elude the simplistic means of diagnosis described here. They seldom exhibit the classical symptoms described in text books. A definitive diagnosis often requires laboratory work. To some extent, this can be done by a local veterinarian, but in many cases whole carcasses or tissue samples will need to be sent to the Veterinary Lab in Abbotsford. This may be done by the veterinarian or the producer himself but in either case it should be realized that diagnosis is extremely difficult when submissions have degenerated badly before arrival at the lab. In some cases, tissues will need to be preserved or frozen before they are shipped.

Producers are often reluctant to make use of services offered by their local veterinarian because of cost. The cost incurred should be carefully weighed against the possible benefit in terms of solving a flock health problem and gaining additional experience. Taking an animal to the local clinic will result in a significant saving over asking the veterinarian to make a farm call. Professional help and accumulated experience (including good records) together with the material presented in this section will make the diagnosis of common flock health problems much more accurate and minimize the costs of disease.

USING THIS SECTION

First, on the basis on the animal's age and sex, establish a preliminary diagnosis using the following tables. Each table is organized on the basis of primary symptoms. When there is more than one possibility on this basis, refer to the secondary symptom and the age sub-group for each disease.

Expanding descriptions of the diseases follow the tables in alphabetical order. Having narrowed the range of possible diseases using the tables, now read their descriptions to determine which one most accurately portrays the problem. Before drawing any conclusions on a final diagnosis, also consider the other diseases listed. If the problem can be identified with confidence, consider the remedy and prevention information given. Consult a veterinarian concerning the availability and dosages of suitable drugs.

Although 52 specific diseases are described, some less common ones have not been included. Whenever doubt exists about the accuracy of a diagnosis, seek professional help.

Table 4.1:

DISEASES OF YOUNG LAMBS

Symptoms			Age
Primary	**Secondary**	**Disease**	**Subgroups**
depression	weakness	Starvation	birth-2wks.
	tight breathing	Pneumonia	
inverted eyelids	watery eyes	Entorpion	newborn
Uncoordination	hindquarters	Swayback	birth-4 mos.
	arching neck	Polioencephalomalacia	
rubbing	itching	Keds	
scabs on mouth and nose	scabs on ewes udders	Soremouth	
scours	dark feces	Coccidiosis	1-4 months
	yellow-gray feces	Colibacillosis (enteric)	birth-6 wks.
	mucus in feces	Salmonella dysentery	
	watery feces	Gastrointestinal roundworms	
stiffness	swollen joints	Chlamydial polyarthritis	1-8 mos.
	following scours	Colibacillosis (septicemic)	2-6 wks.
	joints not swollen	Erysipelothritic pooyarthritis	birth-4 mos.
	weakness	White muscle disease	birth-3 mos.
sudden death	convulsions	Enterotoxemia (Pulpy kidney)	1-6 mos.
swollen abdomen	loss of appetite	Liver abscess (newborn)	newborn
tight breathing	fever	Pneumonia	

Table 4.2:

DISEASES OF OLDER LAMBS

Symptoms			Age
Primary	**Secondary**	**Disease**	**Subgroups**
conjunctivitis	watery eyes	Pinkeye	
coughing	nasal discharge	Lungworm	
depression	lameness circling	Lactic acidosis Listeriosis	4 mos. – mature
distended rumen	grazing legumes	Pasture bloat	
fecal worm segments		Tapeworms	
uncoordination	neck arching	Polioencephalomalacia	4-12 mos.
jaundice	sudden death	Chronic copper poisoning	post weaning
lameness	above hoof between digits stench	Foot Abscess Foot Scald Foot rot	
nasal discharge	sneezing coughing	Nasal bots Lungworm	
poor performance	condemned livers scours distended abdomen	Liver abscess (feedlot) Gastrointestinal roundworms Liver flukes	4 mos.-mature
rectum inverted		Rectal prolapse	
rubbing	itching	Keds	
scabs on lips and nose		Soremouth	
stiffness	swollen joints	Chlamydial polyarthritis	1-8 mos.
swelling around wound	fever	Malignant edema	
tight breathing	fever	Pneumonia	

Table 4.3:

DISEASES OF PREGNANT AND LACTATING EWES

Symptoms			Age
Primary	**Secondary**	**Disease**	**Subgroups**
abortion	weak lambs fever fetal edema	Enzootic abortions Salmonella abortion Vibriosis Listeriosis (uterine)	2-3 yrs. +
depression	grinding teeth sweet breath uterine discharge	Milk fever Pregnancy toxemia Retained afterbirth	post-partum pre-partum
dystocia	tight cervix	Ringwomb	
everted uterus		Uterine prolapse	post-partum
everted vagina		Vaginal prolapse	pre-partum
muscular weakness	grinding of teeth	Milk fever	pre or post-partum older ewes
udder lumps udder firm	udder hot, blue consolidated entire udder	Mastitis Hard udder syndrome Mammary engorgement	

Table 4.4:

DISEASES OF RAMS

Symptoms			Age
Primary	**Secondary**	**Disease**	**Subgroups**
straining	edema	Water belly	
swollen testicles		Epididymitis	

Table 4.5:

DISEASES OF ADULT SHEEP

Symptoms			Age
Primary	**Secondary**	**Disease**	**Subgroups**
coughing	nasal discharge	Lungworms	
depression	bloat	Lactic acidosis	
	circling	Listeriosis	
emaciation	abscesses	Caseous lymphadenities	2 yrs. +
	difficult breathing	Chronic progressive pneumonia	2 yrs. +
	bottle jaw	Gastrointestinal roundworms	
	bottle jaw	Johne's disease	2 yrs. +
	swollen abdomen	Liver flukes	
excitability	grinding teeth	Grass tetany	
fecal worm segments		Tapeworms	
jaundice	sudden death	Chronic copper poisoning	
lameness	above hoof	Foot abscess	
	between digits	Foot scald	
	stench	Foot rot	
nasal discharge	sneezing	Nasal bots	
	coughing	Lungworm	
	shallow breathing	Pulmonary adenomatosis	2 yrs. +
rubbing	itching	Keds	
swelling of wounds	fever	Malignant edema	
swollen abdomen	bottle jaw	Liver flukes	
swollen left side		Pasture bloat	
tight breathing	fever	Pneumonia	

CASEOUS LYMPHADENITIS

Also Called:
pseudotuberculosis, jaw abscess

Affecting:
adult sheep, generally over two years of age

Occurrence:
up to 15% of adult sheep in a flock may be affected

Symptoms:
large abscesses below the jaw, on the cheeks over the jaw joint or in front of the shoulders; when broken these abscesses exude thick greenish-grey pus emaciation with or without obvious abscesses; in the later stages breathing may become difficult

Cause:
the bacterium Corynebacterium ovis

Diagnosis:
symptom; laboratory culture and identification of Corynebacterium ovis from Abscess exudate

Remedy:
cull and slaughter

Prevention:
1. open abscesses with a cut on the bottom side, squeeze out pus into a rag and scour inside of capsule with iodine - destroy rags by burning and disinfect equipment
2. do not allow abscesses to break on their own – this will only permit spread of the disease through superficial cuts on other sheep
3. when shearing, always shear sheep with abscesses last – shearing wounds are often infected by contaminated shearing equipment

Also Consider:
Johne's disease, chronic progressive pneumonia

CHLAMYDIAL POLYARTHRITIS

Also called:
stiff lamb disease (not to be confused with white muscle disease)

Affecting:
lambs 1-8 months of age, particularly on entering feedlot

Occurrence:
sporadic but may affect 25-30% of lamb crop

Symptoms:
stiffness or lameness in 1 to 4 limbs; swelling of joints; fever (41-42^{o}C); conjunctivitis; loss of appetite; arched back

Cause:
a Chlamydial micro-organism

Diagnosis:
symptoms; laboratory culture and identification of Chlamydia from joint fluid

Remedy:
intramuscular administration of oxytetracycline (e.g. liquamycin) isolation of affected animals

Prevention:
avoid situations where lambs are crowded into corrals and other facilities which have become heavily contaminated with manure and wet bedding, disinfect navels of newborn lambs

Also consider:
Erysipelothritic polyarthritis, colibacillosis (septicemic, white muscle disease, lactic acidosis

CHRONIC COPPER POISONING

Also Called:
no other common name

Affecting:
sheep of all ages beyond weaning

Occurrence:
usually sporadic but up to 20% of flock may be affected

Symptoms:
jaundice/anemia; accelerated breathing; dark coloured urine; weakness; sudden deaths after shipping, handling or other stress

Cause:
the gradual accumulation of copper in the liver from rations containing in excess of 10 parts per million copper followed by sudden release into the blood; low molybdenum levels (less than 1 ppm) may accentuate the problem

Diagnosis:
symptoms; laboratory measurement of elevated liver and kidney copper levels

Remedy:
reduce dietary copper levels; drench daily with a solution containing 100 mg ammonium molybdate and 1 gram sodium sulphate in 20 cc of water for a period of 3 weeks

Prevention:
feed test to verify that the daily copper intake is 5-10 ppm of the daily feed intake

Also consider:
toxicity due to other substances such as lead, nitrates, insecticides, etc., liver flukes

CHRONIC PROGRESSIVE PNEUMONIA

Also Called:
maedi, lunger disease

Affecting:
sheep 2 years of age and older

Occurrence:
1-2% of mature ewes per year

Symptoms:
gradually increasing difficulty in breathing; rapid, shallow breathing; declining physical condition

Cause:
a slow-acting virus (retrovirus)

Diagnosis:
symptoms; laboratory evidence of lung consolidation

Remedy:
isolate and destroy individual animals, which exhibit chronic respiratory problems with declining conditions score

Prevention:
avoid mixing adults of unknown disease status with an established, healthy flock

Also Consider:
pulmonary adenomatosis, pneumonia, lungworm

COCCIDIOSIS:

Also Called:
black scours, hemorragic diarrhea, coccidial dysentery

Affecting:
lambs 1-4 months of age

Occurrence:
severe outbreaks can affect 10-15% of the lamb crop

Symptoms:
scours (diarrhea) usually dark in colour, occasionally blood-stained, lamb stands with back arched; coccidial oocysts in fecal samples

Cause:
protozoa of the Eimeria genus

Diagnosis:
symptoms; laboratory identification of Eimeira oocysts in feces

Remedy:
oral treatment with sulfonamide (e.g. Sulmet); separate affected animals from remainder of flock; destroy bedding contaminated by affected animals

Prevention:
1. keep waters and feeders free of fecal contamination
2. yards should be well drained to prevent puddling

Also Consider:
salmonella dysentery, colibacillosis, gastrointestinal roundworms

COLIBACILLOISIS (enteric)

Also Called:
E. coli infection, scours

Affecting:
lambs up to six weeks of age but those 2-3 days of age are more commonly affected

Occurrence:
severe outbreaks can involve 10-15% of young lambs

Symptoms:
scours (diarrhea) usually yellow to yellow-gray in colour; lamb stands with back arched; loss of appetite; dehydration

Cause:
the bacterium Escherichia coli

Diagnosis:
symptoms; laboratory isolation of virulent strains of E. Coli from the intestines

Remedy:
early treatment with oral antibacterials such as sulfonamide (e.g. Sulmet) or nitrofuran (e.g. Furacin); separate lamb(s) and ewe from rest of flock; administer electrolytes; destroy bedding contaminated by infected lambs

Prevention:
1. disinfect the navels of newborn lambs
2. clean out and lime lambing, claiming and mixing pens before lambing; re-bed with clean shavings or straw; consider changing to a new lambing area midway through lambing

Also Consider:
starvation, salmonella dysentery, coccidiosis

COLIBACILLOSIS (septicemic)

Also Called:
colibacillary arthritis

Affecting:
lambs 2-6 weeks of age

Occurrence:
can involve 5-10% of young lambs

Symptoms:
stiff limbs; movements incoordinated; head deflected to one side; vision may be impaired; fever (41-42 C); later convulsions; this form of colibacillosis usually follows the occurrence of at least a few cases of colibacillary scours (see Colibacillosis-enteric)

Cause:
the bacterium Escherichia coli

Diagnosis:
symptoms; laboratory isolation of virulent strains of E. coli

Remedy:
intramuscular oxytetracycline (e.g. Liquamycin) or chloramphenicol (e.g. Chlormycetin, Rogarmycin); isolate affected lamb(s); destroy bedding contaminated by infected lambs

Prevention:
1. snip and disinfect the navels of newborn lambs
2. clean out and lime lambing, claiming and mixing pens before lambing; re-bed with clean shavings or straw

Also Consider:
erysipelothritic polyarthritis, chlamydial polyarthritis; white muscle disease; lactic acidosis

EXTEROTOXEMIA

Also Called:
enterotoxemia of suckling lambs, milk colic, overeating disease, pulpy kidney

Affecting:
lambs 1-6 months of age; most commonly the fastest growing single lambs which are most aggressive in their eating habits

Occurrence:
sporadic; the disease is extremely infectious but not contagious (from lamb to lamb)

Symptoms:
convulsions and sudden death in the fast growing lamb

Cause:
the bacterium Clostridium perfringens type D (formerly called Clostridium welchii Type D)

Diagnosis:
symptoms; identification of epsilon toxin in intestine or blood; isolation of C1. Perfringens

Remedy:
none

Prevention:
1. vaccinate ewes 2-4 weeks before lambing with a seven-way (Heptavax, Tasvax-7) or eight way (Covexin-8, Coopavax-8) clostridial vaccine
2. vaccinate lambs between 5 and 7 weeks of age

Also Consider:
pneumonia, chronic copper toxicity

ENTROPION

Also Called:
inverted eyelids

Affecting:
lambs at birth

Occurrence:
sporadic, may affect 2-5% of newborn lambs

Symptoms:
watery eyes; conjunctivitis; eyelids (usually lower but occasionally upper) rolled inwards such that lashes irritate eyeball

Cause:
genetic

Diagnosis:
symptoms only

Remedy:
revert eyelid to normal position and make cut with sharp scissors perpendicular to lid, relieving tension; apply topical antibiotic (e.g. mastitis treatment)

Prevention:
identify ram or ewe family line responsible; do not use their offspring as replacement stock

Also Consider:
pinkeye, chlamydial polyarthritis, colibacillosis (septicemic), pneumonia

ENZOOTIC ABORTION

Also Called:
chlamydial abortion, EAE (enzootic abortion of ewes), ovine viral abortion

Affecting:
pregnant ewes, particularly those 2-3 years of age

Occurrence:
an initial outbreak may involve up to 20% of ewes but in subsequent years only 5% may be affected

Symptoms:
abortions, stillbirths in last month of pregnancy and weak lambs

Cause:
a Chlamydial micro-organism

Diagnosis:
symptoms; laboratory isolation of Chlamydia from placentas, fetuses or uterine discharges

Remedy:
intramuscular administration of oxytetracycline (e.g. Liquamycin); isolation of affected animals

Prevention:
1. isolate ewes which abort
2. remove aborted membranes and fetus and either submit for examination or destroy along with contaminated bedding
3. thoroughly clean out facilities following an outbreak of abortions
4. submit membranes, fetus and placenta for verification of cause
5. a vaccine is available but quite expensive

Also Consider:
listeriosis (uterine), salmonella abortion, vibriosis and abortions produced by non-specific causes such as trauma, simple reproductive failure and pregnancy toxemia

EPIDIDYMITIS

Also Called:
ovine brucellosis

Affecting:
sexually mature rams; mainly affecting older animals

Occurrence:
in flocks having less than ten rams only a single ram is usually affected

Symptoms:
swelling and tenderness in one, but sometimes both testicles

Cause:
the bacterium Brucella ovis

Diagnosis:
symptoms; laboratory examination of semen; isolation of Brucella ovis

Remedy:
the inflammation may last 2 to 5 weeks, but the infection may persist for years; infected rams should be culled

Prevention:
1. purchase only virgin rams (ram lambs)
2. infection spreads from ram to ram when they sequentially breed the same ewe- therefore, be sure any new rams introduced into the flock are clean

Also Consider:
caseous lymphadenitis abscess

ERYSIPELOTHRITIC POLYARTHRITIS

Also Called:
stiff lamb disease (not to be confused with white muscle disease)

Affecting:
lambs up to four months of age but most commonly those 1-6 weeks old

Occurrence:
sporadic but may affect 5-10% of lamb crop; infecting newborn lambs through the umbilicus and young lambs through castrating and docking wounds

Symptoms:
slow developing, prolonged lameness in one or all four limbs with little or no swelling of the joints; depression; loss of appetite

Cause:
the bacterium Erysipelothrix insidiosa, the same as that which causes swine erysipelas

Diagnosis:
symptoms; laboratory isolation of E. insidiosa from joint fluid

Remedy:
early treatment with penicillin; late treatment is rarely successful

Prevention:
1. always disinfect the navels of newborn lambs
2. avoid lambing, docking and castrating in areas heavily contaminated from previous use; clean out, lime and re-bed these areas before re-using

Also Consider:
chlamydial polyarthritis, white muscle disease, lactic acidosis, colibacillosis (septicemic)

FOOT ABSCESS

Also Called:
digital suppuration

Affecting:
sheep of all ages

Occurrence:
rarely more than 10% of a flock are affected; will often affect only a single digit (toe)

Symptoms:
lameness without the characteristic stench of foot rot; swelling and redness above the hoof; pussy exudate from sinus opening

Cause:
the bacteria Sphaerophorus necrophorus and Corynebacterium pyogenes

Diagnosis:
symptoms only

Remedy:
separate affected animals; drain pustules; trim hooves; treat with intramuscular penicillin and with application of topical antibiotic onto cleaned tissue

Prevention:
1. cull chronically affected animals
2. trim hooves regularly
3. prevent infected animals from contaminating pastures
4. control of foot rot

Also Consider:
foot rot, foot scald

FOOT ROT

Also Called:
contagious foot rot

Affecting:
sheep of all ages

Occurrence:
widespread in BC, often affecting over half of all animals in a flock; very contagious

Symptoms:
lame and limping sheep; misshapen hooves which, when trimmed, emit a characteristic stench

Cause:
the bacteria Fusiformis nodosa (now called Bacteroides nodosus), Sphaerophorus necrophorus (now called Fusobacterium necrophorum) and, often, several other species

Diagnosis:
symptoms; laboratory identification of B. nodosus in smears of degenerating hoof tissue

Remedy:
separate affected animals; trim all hooves to expose any pockets of infection; foot bath in 12% zinc sulphate; repeat trimming and footbathing bi-weekly

Prevention:
1. cull chronically affected animals and animals with broken or deformed hooves
2. trim hooves regularly to prevent formation of pockets where infection can establish
3. prevent infected animals from contaminating pastures
4. a foot-rot vaccine (Clovax) is available which may afford some degree of protection when superimposed upon good management

Also Consider:
foot scald, foot abscess

FOOT SCALD

Also Called:
benign foot rot

Affecting:
sheep of all ages

Occurrence:
usually affects only a few animals in a flock

Symptoms:
lameness without the characteristic stench of foot rot; infection is confined to the skin between the digits

Cause:
a strain of Fusiformis nodosus which is not as infectious as that causing foot rot

Diagnosis:
symptoms only

Remedy:
topical application of antibiotic cream; intramuscular penicillin

Prevention:
isolate affected animals

Also Consider:
foot rot, foot abscess

GASTROINTESTINAL ROUNDWORMS

Also Called:
nematode gastroenteritis, gastrointestinal parasitism

Affecting:
sheep of all ages

Occurrence:
persistent, causing loss of efficiency on a flock-wide basis, especially in high-moisture areas

Symptoms:
anemia, lack of growth and diarrhea in lambs; loss of condition in mature sheep; bottle jaw

Cause:
up to ten different species of Helminth roundworms which parasitize the stomach or small intestine

Diagnosis:
symptoms; laboratory identification of Helminth eggs in fecal samples

Remedy:
dosing of whole flock with an anthelmintic such as levamisole (Tramisol, Ripercol) or thiabendazole (TBZ, Thiabenzole, Omnizole)

Prevention:
1. de-worm flock routinely;
a) in dry interior regions, deworm 1-3 weeks after lambing with thiabendazole then again in the fall when sheep come in off pasture with levamisole
b) in moist south coastal areas, de-worm through the pasture season with thiabendazole; de-worm again at the end of the pasture season with levamisole
2. where possible, sheep which have been de-wormed should be changed to a “clean” pasture which has been unused for grazing for a period of time which will vary according to local conditions of temperature and humidity (see Stocktalk, October, 1981)

Also Consider:
1. for lambs-undernutrition, cocidiosis, damage from pneumonia
2. for ewes-undernutrition, Johne’s disease, caseous lymphadenitis

GRASS TETANY

Also Called:
hypomagnesemia, grass staggers

Affecting:
sheep of all ages although susceptibility increases with the age of the animal; lactating ewes on fast growing pasture are particularly susceptible

Occurrence:
sporadic, but in the extreme, 20% of a flock might be affected

Symptoms:
excitability; irritability; twitching muscles; grinding teeth; convulsions

Cause:
magnesium deficiency

Diagnosis:
symptoms; laboratory measurement of low plasma magnesium levels

Remedy:
early subcutaneous injection of a calcium gluconate – magnesium sulphate solution; distribute the administration over 4-6 sites

Prevention:
flock should have access to mineral containing magnesium

Also Consider:
milk fever, enterotoxemia

HARD UDDER SYNDROME

Also Called:
hard udder

Affecting:
lactating ewes generally over two years of age

Occurrence:
may affect 5-10% of ewes

Symptoms:
udder with a hard, shelved internal lump often extending in a trunk down to the teat canal, no inflammation, no fever

Cause:
unknown

Diagnosis:
symptoms; proteinaceous deposits in mammary alveoli

Remedy:
none

Prevention:
cull repeat cases

Also Consider:
mastitis, engorgement

JOHNE'S DISEASE

Also Called:
paratuberculosis

Affecting:
sheep over a year of age

Occurrence:
sporadic; may affect 1-10% of a flock

Symptoms:
weight loss in a mature sheep with a good appetite; soft feces; bottle jaw; anemia

Cause:
the slow developing bacterium Mycobacterium paratuberculosis

Diagnosis:
symptoms; laboratory identification of M. paratuberculosis in lining of intestines

Remedy:
isolate and destroy individual animals which fail to thrive with the rest of the flock

Prevention:
Johne's disease spreads primarily through fecal contamination therefore:
1. keep feeders and waterers free of fecal contamination
2. clean out bedding and lambing areas frequently and spray down with creolin or phenolic disinfectants
3. avoid overcrowding

Also Consider:
saseous lymphadenitis, chronic progressive pneumonia, pulmonary adenomatosis, gastrointestinal roundworms

KEDS

Also Called:
sheep tick

Affecting:
sheep of all ages

Occurrence:
periodically parasitizing the entire flock

Symptoms:
itching; rubbing; presence of keds in the fleece

Cause:
the common sheep ked Melophagus ovinus

Diagnosis:
symptoms only

Remedy:
dust flock with 1% rotenone or spray with carbaryl, coumaphos, lindane or ronnel; a veterinarian may prescribe fention (Spotton)

Prevention:
inspect and eliminate keds on sheep being introduced into a ked-free flock

Also Consider:
mites; lice (both eliminated by dusting or spraying)

LACTIC ACIDOSIS

Also Called:
grain overload, grain engorgement, founder, laminitis

Affecting:
weaned lambs and adult sheep having access to grain

Occurrence:
sporadic, affecting only those animals having accidental access to grain or animals unaccustomed to consuming significant quantities of grain

Symptoms:
loss of appetite, depression, weakness, diarrhea, lameness (founder), bloat

Cause:
excess production of lactic acid from grain by rumen micro-organisms

Diagnosis:
history (access to grain); symptoms; laboratory findings of acidic rumen fluid and urine, high blood levels of lactate and blackening of rumen papillae.

Remedy:
administer buffer solution orally (Rumenlax, Carmalax); administer oral penicillin or oxytetracycline (Terramycin)

Prevention:
1. control the possibility of accidental access to grain storage sites
2. adapt animals over a 7-10 day period to the consumption of grain – gradually increase the allotment in 3-4 steps

Also Consider:
pasture bloat, pneumonia, pregnancy toxemia, and enterotoxemia

LISTERIOSIS (encephalitic)

Also Called:
circling disease

Affecting:
sheep of all ages but feedlot lambs 4-12 of age are most susceptible

Occurrence:
may affect 5-10% of feedlot lambs, especially those being fed silage

Symptoms:
depression; fever (40-41^{o}C); weakness; incoordination, circling, loss of appetite, facial paralysis-drooping eyelid or ear on one side; neck may flex away from affected side; animal may lean or push on stationary objects; nasal discharge

Cause:
the bacterium Listeria monocytogenes

Diagnosis:
symptoms; laboratory identification of L. monocytogenes from brainstem

Remedy:
Early intramuscular administration of chloramphenicol (Chlormycetin, Rogarmycine); late treatment may kill the bacteria but irreversible brain damage might have been done; isolate affected animals; destroy bedding and any dead animals by burning or burying

Prevention
Avoid overcrowded and contaminated feedlot situations; risk is high when silage is fed

Also Consider:
Pneumonia, poliencephalomalacia

LISTERIOSIS (uterine)

Also Called:
listeric abortion

Affecting:
ewes in fourth and fifth months of pregnancy

Occurrence:
up to 20% of ewes may abort in a severe outbreak; most common when silage is being fed

Symptoms:
abortion with no nervous signs (see Listeriosis – encephalitic)

Cause:
the bacterium Listeria monocytogenes

Diagnosis:
symptoms; laboratory identification of L. monocytogenes from uterine discharges

Remedy:
intramuscular treatment of aborted ewes with chloramphenicol (Chlormycetin, Rogarmycine); isolate aborted ewes; clean up and burn bedding contaminated with aborted fetus and membranes; handle this material with gloved hands as Listeria may also infect humans

Prevention:
clean out and lime lambing, claiming and mixing pens before lambing; re-bed with clean shavings or straw; maintain sanitary conditions in areas where pregnant sheep are bedded; risk increases when silage is fed

Also Consider:
enzootic abortion, salmonella abortion, vibrio abortion, pregnancy toxemia, accidental abortion

LIVER ABSCESS (feedlot lambs)

Also Called:
rumenitis – liver abscess complex

Affecting:
feedlot lambs to slaughter

Occurrence:
up to 50-75% of the livers from a group of slaughter lambs may be condemned

Symptoms:
asymptomatic except for depressed weight gains and feed efficiency

Cause:
the bacterium Sphaerophorus necrophorus (formerly Fusiformis necrophorus); the same bacterium involved in foot rot

Diagnosis:
symptoms; abscesses in liver evident upon slaughter

Remedy:
none since problem is not obvious until slaughter

Prevention:
liver abscesses area sequel to rumenitis (inflammation of the lining of the ruemen) which can result from lactic acidosis, soremouth virus, consumption of contaminated water or timber milk vetch

Also Consider:
lactic acidosis, caseous lymphadenitis

LIVER ABSCESS (newborn lambs)

Also Called:
hepatic necrobacillosis

Affecting:
newborn lambs up to 10 days of age

Occurrence:
5-10% of newborn lambs may be affected in severe cases

Symptoms:
loss of appetite; swollen abdomen

Cause:
the bacterium Sphaerophorus necrophorus (formerly Fusiformis necrophorus); the same bacteria involved in foot rot

Diagnosis:
symptoms; laboratory isolation of Sph. Necrophorus from livers

Remedy:
early treatment with penicillin-streptomycin (Pen-Strep, Derapen)

Prevention:
1. snip and disinfect the navels of newborn lambs
2. clean out and lime lambing, claiming and mixing pens before lambing; re-bed with clean shavings or straw
3. clean out and lime claiming pens after each use

Also Consider:
starvation, pneumonia, colibacillosis

LIVER FLUKES

Also Called:
fascioliasis, liver rot

Affecting:
grazing sheep of all ages especially those grazing damp pastures in warm weather

Occurrence:
may easily affect half of a grazing flock

Symptoms:
distended abdomen, painful when manipulated; loss of condition; anemia; bottle jaw

Cause:
in BC, the trematode fluke Dicrocoelium dendriticum has most commonly been identified

Diagnosis:
symptoms; laboratory identification of trematode eggs in fecal samples; flukes evident in liver at slaughter

Remedy:
consult your veterinarian on the availability of suitable treatments (e.g. dioxanide, rafoxanide, hexachlorophene)

Prevention:
aimed at reducing the population of snails which serve as intermediate hosts:
1. drain areas where stagnant water accumulates or fence these areas off
2. apply a molluscicide (snail-killer) to the pasture (e.g. a solution of 1 lb. copper sulphate dissolved in 12 gallons of water)

Also Consider:
gastrointestinal roundworms, Johne's disease, caseous lymphadenitis

LUNGWORMS

Also Called:
parasitic pneumonia, verminous pneumonia, husk

Affecting:
sheep of all ages from 2 months

Occurrence:
persistent, causing loss of efficiency on a flock-wide basis, especially in high-moisture areas

Symptoms:
bronchitis; persistent coughing and nasal discharge; loss of condition

Cause:
up to 3 species of Helminth roundworms which parasitize the lungs

Diagnosis:
symptoms; laboratory identification of lungworm eggs in fecal samples; adult worms in bronchi at post-mortem

Remedy:
dosing of whole flock with the anthelmintic levamisole (Tramisol, Ripercol)

Prevention:
de-worm flock every year in the fall with levamisole

Also Consider:
pneumonia; chronic progressive pneumonia, pulmonary adenomatosis

MALIGNANT EDEMA

Also Called:
gas gangrene

Affecting:
sheep of all ages

Occurrence:
sporadic, infecting individuals through shearing, docking, castrating wounds

Symptoms:
rapidly spreading, painful soft swelling around a wound; depression; high fever ($41.5^{o}C$)

Cause:
the bacteria Clostridium chauvoei and Clostridium septicum

Diagnosis:
symptoms; laboratory identification of causative organisms in fluid from swelling

Remedy:
intramuscular treatment with penicillin-streptomycin (Pen-Strep)

Prevention:
1. always disinfect the navels of newborn lambs
2. avoid lambing, docking, castrating and shearing in areas that have become heavily contaminated with manure; clean out, lime and re-bed these areas with fresh shavings or straw before re-using
3. vaccinate with seven-way (Heptavac, Tasvax-7) or eight way (Coopavax-8, Covexin-8) clostridial vaccine:
   a) ewes – 2-4 weeks before lambing
   b) lambs – at 5-7 weeks of age

Also Consider:
blackleg

MAMMARY ENGORGEMENT

Also Called:
meaty udder

Affecting:
ewes of all ages in first week post-partum

Occurrence:
may affect 10-15% of ewes

Symptoms:
entire rudder is firm (meaty) and apparently engorged with milk; condition disappears if lamb is allowed to nurse

Cause:
failure of mammary gland to "let down" milk; probably a hormonal imbalance

Diagnosis:
symptoms only

Remedy:
1. intramuscular administration of oxytocin, although this rarely successful
2. allow lambs to continue nursing in an attempt to stimulate "let down"
3. lambs may require supplementation for a few days to two weeks

Prevention:
none

Also Consider:
mastitis, hard udder syndrome

MASTITIS

Also Called:
blue bag

Affecting:
lactating ewes

Occurrence:
usually no more than 5% of ewes

Symptoms:
coagulated milk; swollen inflamed udder, usually only one half; fever (40-41^{o}C); depression; udder may turn blue and detach

Cause:
usually the bacterium Staphylococcus aureus but sometimes Pasteurella haemolytica or other bacteria

Diagnosis:
symptoms; laboratory identification of causative organisms

Remedy:
isolate affected ewes; administer penicillin-streptomycin IM; cull affected ewes

Prevention:
1. examine all udders before breeding, cull any with hard lumps
2. thoroughly examine the udders of all potential purchases; ewes with lumps may be carriers

Also Consider:
hard udder syndrome, mammary engorgement

MILK FEVER

Also Called:
hypocalcemia

Affecting:
ewes during the last month of pregnancy or the first two weeks of lactation

Occurrence:
usually less than 10% of ewes are affected but in serious outbreaks, 30% may be involved; older ewes are most susceptible

Symptoms:
ewes go down or may walk with stiff gait; grinding of teeth; muscular tremors' muscular weakness

Cause:
low blood level of calcium

Diagnosis:
symptoms; measurement of low blood calcium level; favorable response to administration of calcium gluconate

Remedy:
immediate subcutaneous or, preferably, intravenous administration of calcium gluconate

Prevention:
1. feed test to assure adequate calcium in ration, mineral supplementation may be necessary
2. calcium levels can be increased by increasing the proportion of alfalfa or clover in the forage
3. calcium:phosphorus ratio should be in the 2:1 to 5:1 range
4. adequate vitamin D is required to permit calcium utilization

Also Consider:
pregnancy toxemia, pneumonia

NASAL BOTS

Also Called:
nasal myiosis, sheep nasal fly disease, head grub

Affecting:
sheep of all ages

Occurrence:
widespread, may affect 80% of a flock

Symptoms:
affected sheep stamp their feet, shake their heads, sneeze, rub their noses on the ground; pussy nasal discharge; difficult nasal breathing

Cause:
the larvae of the fly Ostrus ovis

Diagnosis:
symptoms; examination of internal nasal area for Oestrus ovis larvae

Remedy:
a veterinarian may prescribe the use of an organosphosphate insecticide such as fenthion (Spotton)

Prevention:
none

Also Consider:
lungworm, pneumonia

PASTURE BLOAT

Also Called:
bloat

Affecting:
sheep of all ages consuming succulent forage containing more than 50% legume (alfalfa, clover)

Occurrence:
sporadic, but an outbreak may involve 5-10% of a flock

Symptoms:
rapid distention of the rumen showing up on the animal's left side immediately being the last rib; affected sheep may kick at their abdomen; difficult breathing

Cause:
formation of foam in the rumen as a result of consuming legumes

Diagnosis:
symptoms; history of grazing area or feed; stable foam in rumen at post-mortem

Remedy:
drench with antifoaming agent such as dioctol (e.g. Bloat Guard) or vegetable oil; try to pass a 3/8 – ½ inch stomach tube to release the foam; although it is possible to puncture the rumen with a trochar behind the last rib to release the foam, the chances of developing peri-tonitis from this procedure make it a last-ditch alternative

Prevention:
1. when grazing pastures with a high legume content, animals should have access to the forage day and night -–the risk of bloat is much greater when animals enter such a pasture with an empty stomach
2. it is possible to feed poloxalene daily as a preventative measure when problems are anticipated
3. avoid introducing animals to legume pastures which are growing rapidly after rain or heavy dew

Also Consider:
lactic acidosis

PINKEYE

Also Called:
follicular conjunctivitis, contagious ophthalmia, kerato-conjunctivitis

Affecting:
sheep of all ages; lambs are more susceptible than adults

Occurrence:
may spread to affect 50% of a group of feedlot lambs; very contagious

Symptoms:
watery eyes; clouding of the cornea; the white of the eye becomes pink; blindness; corneal ulcers

Cause:
a Chlamydial micro-organism (previously called Rickettsia)

Diagnosis:
symptoms only

Remedy:
application of chlortetracycline (Aureomycin) ointment to affected eyes; isolate affected animals

Prevention:
avoid situations where dusty feeds and feedlots predispose to infection by damaging the surface of the eye

Also Consider:
entropion

PNEUMONIA

Also Called:
enzootic pneumonia, bacterial pneumonia, pasteurellosis, shipping fever

Affecting:
sheep of all ages although lambs from two weeks to six months of age are most susceptible

Occurrence:
related to environmental and management stress (e.g. humid barn with poor ventilation, shipping stress, abrupt changes in weather); a moderately severe outbreak may result in loss of 25% of lamb crop

Symptoms:
fever (41-42^{o}C; normal lamb temperature is 38-40^{o}C), weeping eyes; shallow (tight) breathing, depression, loss of appetite

Cause:
the bacteria Pasteurella haemolytica or Pasteurella multocida

Diagnosis:
symptoms; laboratory evidence of lung consolidation; isolation of causative organisms from lungs at post-mortem

Remedy:
treat affected sheep with a broad-spectrum antibiotic such as oxytetracycline (e.g. Liquamycin) and separate from the rest of the flock

Prevention:
1. close up sources of drafts where flock is bedding down
2. improve ventilation in barn to reduce humidity without introducing ground-level drafts

Also Consider:
enterotoxemia, pinkeye, colibacillosis (septicemic), lungworms, chronic progressive pneumonia, pulmonary adenomatosis

POLIOENCEPHALOMALACIA

Also Called:
polio, cerebrocortical necrosis

Affecting:
sheep of any age but feedlot lambs are most susceptible

Occurrence:
sporadic, usually affecting only single, but at most, a few lambs

Symptoms:
uncoordinated movements; head arching backwards; kicking, paddling or stiffening of legs when lying down; convulsions, blindness

Cause:
unknown but probably related to vitamin B_1 (thiamine) metabolism

Diagnosis:
symptoms; post-mortem evidence of grey matter necrosis; favorable response to B_1 treatment

Remedy:
early treatment with vitamin B_1 (thiamine) intramuscularly

Prevention:
since cause is unknown, prevention is not practiced

Also Consider:
listeriosis, enterotoxemia, lead poisoning

PREGNANCY TOXEMIA

Also Called:
ketosis lambing sickness, twin lamb disease, sleepy sickness

Affecting:
ewes late in their second and subsequent pregnancies

Occurrence:
up to 20% of ewes over three years of age may be affected

Symptoms:
ewe becomes very sluggish; loss of appetite; incoordinated movements; weakness; blindness in later stages; smell of acetone on breath (sweetbreath); urine strong smelling and dark in colour

Cause:
lack of sufficient energy intake late in pregnancy; body fat is mobilized and toxic ketones are formed

Diagnosis:
symptoms; history; urine ketone test

Remedy:
1. immediate and early drenching with propylene glycol (not ethylene glycol), glycerol or ketomalt
2. intravenous glucose
3. intravenous glucocorticoid hormones (e.g. Fluocort), these treatments are effective in only about 50% of cases
4. in a valuable animal, abortion by caesarian section

Prevention:
beginning 6-8 weeks before lambing gradually increase energy intake of pregnant ewes by feeding some grain as well as introducing better quality forage; avoid having ewes too fat in mid-pregnancy

Also Consider:
pneumonia, caseous lymphadenitis, Johne's disease, milk fever

PULMONARY ADENOMATOSIS

Also Called:
pulmonary carcinoma; jaagsiekte

Affecting:
adult sheep over two years of age

Occurrence:
sporadic; may occur in 1-2% of affected flocks

Symptoms:
chronic shallow, rapid breathing; frequent coughing; copious nasal discharge when head is down; emaciation

Cause:
probably a Herpes virus causing tumors on the lung

Diagnosis:
symptoms; laboratory evidence of grey-blue nodules throughout lungs

Remedy:
isolate and destroy individual animals which demonstrate chronic respiratory problems with declining condition score

Prevention:
avoid bringing mature ewes into an established flock in order to maintain freedom from this disease

Also consider"
chronic progressive pneumonia, pneumonia, lungworm, nasal bots

RECTAL PROLAPSE

Also Called:
no other common name

Affecting:
mainly feedlot lambs but occasionally adult sheep

Occurrence:
sporadic

Symptoms:
the end of the rectum everts (turns inside-out) and protrudes out of the anus

Cause:
either a weakness in the rectal attachments or increased abdominal pressure due to coughing, straining, overfilling of rumen or excess abdominal fat

Diagnosis:
symptoms only

Remedy:
cut a piece of ¾ inch (ID) plastic pipe about 6 inches long and cut a groove around the pipe at about the middle; insert the pipe through the prolapse and anus so that the groove lies just outside the anus; install a rubber castrating ring around the prolapse so that it lines up with the groove in the pipe; the everted portion of the rectum will shed in 2-3 weeks

Prevention:
it is widely believed that the risk of rectal prolapse is increased when tails are docked too closely

Also Consider:
vaginal prolapse, uterine prolapse

RETAINED AFTERBIRTH

Also Called:
retained placenta

Affecting:
Ewes after lambing

Occurrence:
1-2% of post-partum ewes

Symptoms:
ewes fail to pass the afterbirth within 24 hours after lambing followed by infection and foul smell, depression, fever

Cause:
uterine fatigue after a difficult lambing; insufficient calcium an/or hormonal imbalance

Diagnosis:
symptoms only

Remedy:
administer long acting penicillin to help control infection; intramuscular oxytocin to contract uterus and expel placenta

Prevention:
adequate levels of selenium in the ration may prevent some cases

Also Consider:
depression due to milk fever or pregnancy toxemia

RINGWOMB

Also Called:
no other common name

Affecting:
ewes, especially ewe lambs, before lambing

Occurrence:
may affect 2-5% of ewes in a flock in a given year

Symptoms:
water bag or broken membranes appear but no further progress is made in lambing within 4 hours; on palpation only one or two fingers will pass through the hard ring of muscle which is the cervix

Cause:
probably a hormonal imbalance

Diagnosis:
symptoms only

Remedy:
1. administer penicillin
2. if possible, make sure lamb is in proper position for lambing; engage one or two feet in the cervix and leave for two hours
3. if no progress is made apply pressure to cervix with the fingers for up to 30-40 minutes
4. if no progress is made, take ewe to veterinarian and have a caesarian performed

Prevention:
avoid feeding moldy hay

Also Consider:
failure to lamb due to improper presentation

SALMONELLA ABORTION

Also Called:
paratyphoid abortion

Affecting:
pregnant ewes in last six weeks of gestation

Occurrence:
usually less than 10% of ewes are affected but in severe outbreaks up to half the flock may be involved

Symptoms:
abortion during last six weeks of pregnancy; prior to aborting, ewe may have fever of 41-41.5^{o}C; diarrhea; depression; loss of appetite; weak infected lambs may be born alive, aborted lambs are septicemic and edemic

Cause:
several non-host specific Salmonella bacteria

Diagnosis:
symptoms; laboratory isolation of Salmonella from vaginal discharge, fetus, placenta or maternal feces

Remedy:
treatment of live lambs with oral nitrofurazone (e.g. Furacin); treatment of ewes with oxytetracycline (e.g. Liquamycin)

Prevention:
1. do not permit waterers and feeders to become contaminated with feces, the source of Salmonellae
2. isolate ewes which abort
3. remove aborted membranes and fetus and either submit for examination or destroy along with contaminated bedding
4. submit membranes, fetus and placenta for verification of cause

Also Consider:
listeriosis (uterine), vibriosis, enzootic abortion and abortions produced by non-specific causes such as trauma, reproductive failure and pregnancy toxemia

SALMONELLA DYSENTERY

Also Called:
salmonellosis

Affecting:
lambs of all ages

Occurrence:
may affect 30% of the lamb crop

Symptoms:
diarrhea (scours); mucous and sometimes blood in the manure; fever (41-42 C); lamb stands with back arched; loss of appetite; dehydration

Cause:
the bacterium Salmonella typhimurium or Salmonella arizonae

Diagnosis:
symptoms; laboratory isolation of causative organisms from feces, lymph nodes or blood

Remedy:
early treatment with oral antibacterials such as sulfonamides (e.g. Sulmet) or nitrofurazone (e.g. Furacin); administration of electrolytes; isolate affected animals; destroy contaminated bedding

Prevention:
1. clean out and lime lambing, claiming, mixing and feeding areas and re-bed with clean shavings or straw
2. do not allow animals to become over-crowded in contaminated facilities

Also Consider:
colibacillosis (enteric), coccidiosis

SOREMOUTH

Also Called:
contagious ecthyma, orf, scabby mouth, contagious pustular dermatitis

Affecting:
sheep of any age but lambs on creep or in feedlot are most susceptible; shepherds can also be affected, most commonly with pustules on the hands and forearms

Occurrence:
severe outbreaks may involve 50% of the lamb crop; the incidence in adult sheep is sporadic and of low incidence

Symptoms:
in lambs, pustules and scabs on the lips, mouth, nostrils or eyelids; in the adults, pustules and scabs on the udder above the hoof

Cause:
the contagious ecthyma poxvirus

Diagnosis:
symptoms only

Remedy:
isolate affected animals, remove scabs and treat wounds with antibiotic cream or gentian violet; if lambs are infected, vaccinate all lambs with orf vaccine, available from Canadian Co-operative Wool Growers' outlets

Prevention:
vaccinate lambs but not before two months of age

Also Consider:
ulcerative dermatosis and sheep pox have not been identified in BC.

STARVATION

Also Called:
early lamb mortality for unknown reasons

Affecting:
newborn lambs – birth to 10 days of age

Occurrence:
may account for half of all pre-weaning lamb deaths

Symptoms:
lamb stands with back arched, head down, sunken sides

Cause:
lack of milk from ewe

Diagnosis:
symptoms; stomach found empty on post-mortem examination

Remedy:
1. check ewe's udder for:
   a) wax blockage of teats – strip out wax plug
   b) mammary engorgement – leave lamb with ewe but supplement with bottle
   c) mastitis or hard udder – foster or bottle feed lamb
2. check ewe's behavior in accepting lamb:
   a) is ewe rejecting lamb? - stanchion ewe and help lamb to nurse
   b) is ewe rejecting lamb in favor or its twin? – remove favored lamb for 2-3 hour periods to see if ewe will accept the starved lamb
   c) is ewe the real mother of the starved lamb? – make sure the correct match has been made
3. check lamb's ability to find teat and suck – help lamb to nurse for a day or two
4. check for blockage of lamb's anus with meconium (first manure) – clean lamb's anus

Prevention:
routinely strip ewe's teats and check udder at birth; assist lamb with first nursing and regularly check points 2-4 above

Also Consider":
pneumonia, colibacillosis, white muscle disease

SWAYBACK

Also Called:
enzootic ataxia

Affecting:
lambs from birth to 4 months of age

Occurrence:
sporadic; usually affecting less than 5% of lambs

Symptoms:
uncoordination of hindquarter movements; in mild cases this might only be seen when lamb is running; ewes with crimpless wool or black wool losing colour are indicative of the same problem

Cause:
lack of available copper in the diet of the pregnant ewe – this may infer low copper levels and/or high molybdenum and sulfate levels in feeds

Diagnosis:
symptoms; laboratory evidence of low copper levels in liver

Remedy:
copper supplementation may arrest development of the problem but will not correct the damage already done; daily copper intake should be 5-10 ppm of total daily dry matter intake

Prevention:
1. have forages analyzed for copper and molybdenum
2. feed a salt/mineral mix which will provide 5-20 mg copper per day to the breeding flock, depending on feed analysis results

Also Consider:
starvation, pneumonia, gastrointestinal roundworms

TAPEWORMS

Also Called:
monieszíasis, thysanosomiasis

Affecting:
lambs but occasionally mature sheep

Occurrence:
sporadic

Symptoms:
tapeworm segments in feces

Cause:
the tapeworm Moniezia expansa

Diagnosis:
symptoms; adult worms in the intestinal tracts of slaughter lambs

Remedy:
oral lead arsenate niclosamide or dichlorophene (e.g. Teniatol)

Prevention:
since it is felt that tapeworm parasitism is seldom of economic importance, prevention is not practiced

Also Consider:
gastrointestinal roundworms

UTERINE PROLAPSE

Also Called:
prolapse of the uterus, womb or lamb bed

Affecting:
ewes after lambing

Occurrence:
sporadic

Symptoms:
eversion of the entire uterus with its attached cotyledons

Cause:
Three commonly cited possibilities:
1. loss of tone in the uterine muscles possibly due to calcium or hormonal deficiency
2. straining during a difficult lambing resulting in loss of abdominal attachments
3. straining after lambing due to an everted uterine horn or retained placenta

Diagnosis:
symptoms only

Remedy:
scrupulous cleaning of the everted uterus and replacement to its natural position; insertion of antibacterial bolus; administration of oxytocin (ref. TV Vet Sheep Book, Bibliography)

Prevention:
none

Also Consider:
rectal prolapse, vaginal prolapse

VAGINAL PROLAPSE

Also Called:
prolapse of the cervix

Affecting:
ewes, and particularly ewe lambs in late pregnancy

Occurrence:
may affect 5% of ewe flock

Symptoms:
cervix everts through vulva

Cause:
mechanical – overloading of the abdominal or pelvic cavities due to:
1. small capacity – particularly in ewe lambs
2. excess fat
3. large fetus
4. distended rumen from feeding low quality roughage

Diagnosis:
symptoms only

Remedy:
early reversion of the vagina and installation of a bearing retainer; the longer the cervix remains everted, the more difficult it will be to replace it; cull affected ewes

Prevention:
1. do not breed ewe lambs which are less than 75% of their expected mature body weight
2. do not allow pregnant ewes to become over-fat
3. feed good quality roughage with grain late in pregnancy – reduce bulk by increasing quality

Also Consider:
rectal prolapse, uterine prolapse

VIBRIOSIS

Also Called:
vibrionic abortion

Affecting:
pregnant ewes in the last month of gestation

Occurrence:
usually 20-25% of ewes are affected by in severe outbreaks as many as 70% may be involved

Symptoms:
abortions in last month of pregnancy; aborted fetuses may have subcutaneous edema

Cause:
the bacterium Vibrio fetus intestinalis

Diagnosis:
symptoms; laboratory identification of Vibrio fetus in uterine exudate, cotyledons or fetal stomach

Remedy:
none

Prevention:
1. isolate ewes which abort
2. remove aborted membranes and fetus and either submit for examination or destroy along with contaminated bedding
3. thoroughly clean out and disinfect facilities after an outbreak of abortions
4. submit membranes, fetus and placenta for verification of cause
5. vaccinate

Also Consider:
enzootic abortion, salmonella abortion, listeriosis (uterine) and abortion produced by non-specific causes such as trauma, simple reproductive failure and pregnancy toxemia

WATER BELLY

Also called:
calculosis, urinary calculi, urolithiasis

Affecting:
rams and wethers; most commonly those in feedlot

Occurrence:
sporadic, usually occurring in no more than 2% of feedlot males

Symptoms:
straining to urinate with back arched or sides pumping; loss of appetite; water retention (edema) in the area between back legs and belly; abdominal enlargement; animal may kick at his belly

Cause:
a stone, formed in the bladder, blocking the urethra (urine tube)

Diagnosis:
symptoms; post-mortem findings of urine in abdominal cavity or calculus (stone) in urethra

Remedy:
often, the stone is lodged in the urethral process, the hair-like projection at the end of the penis; evert the penis and examine this process; if a stone is seen, snip off the end of the process with the stone in it, the animals will now likely urinate; apply antibiotic ointment to the process and administer an intramuscular dose of penicillin-streptomycin (Pen-Strep, Derapen)

Prevention:
1. animals should have free access to loose salt or salt-mineral mix to encourage water consumption
2. make sure that abundant, fresh, clean water is available
3. rations should have a calcium:phosphorus ratio of 2:1 to 5:1

Also Consider:
pasture bloat, lactic acidosis

WHITE MUSCLE DISEASE

Also Called:
nutritional muscular dystrophy, stiff lamb disease

Affecting:
lambs from birth to three months of age

Occurrence:
usually affects only 1-5% of lamb crop and is most frequently seen in sturdy, well-doing lambs

Symptoms:
sudden death may occur when the heart muscle is affected; otherwise lamb will stand with back arched, neck compressed, will walk with a stiff gait

Cause:
selenium deficiency

Diagnosis:
symptoms; laboratory measurement of low selenium levels in blood, liver or kidney; post-mortem identification of lesions in skeletal or cardiac muscle

Remedy:
intramuscular injection of a selenium vitamin E preparation (e.g. Dystosel, E-Sel)

Prevention:
feed test and if feeds are low in selenium:
a) offer a mineral mix containing selenium to the flock
b) administer a selenium –vitamin E preparation to ewes 2-4 weeks before lambing

Also Consider:
pneumonia, erysipelothritic polyarthritis, chlamydial polyarthritis, colibacillosis (septicemic); lactic acidosis

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