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Sheep and cattle disorders reported at abattoirs

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Sheep and cattle disorders reported at abattoirs

Compiled by
Michael Paton
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Northam

By
Veterinary Officers
of Animal Industries
Department of Agriculture
Western Australia

Department of Agriculture
Western Australia
Front cover: AQIS meat inspector recording the presence of a disorder using a computerised system designed for the Meat Inspection Findings Project
Sheep and cattle disorders reported at abattoirs

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IV  SHEEP AND CATTLE DISORDERS REPORTED AT ABATOIRS
Foreword

Meat inspectors at abattoirs record a lot of information about diseases and disorders of sheep and cattle. This information is mentioned briefly in stock health reports that are sent to producers who consign animals to Robb Jetty or E.G. Green abattoirs.

Department of Agriculture veterinarians have compiled information on these disorders and diseases for this publication.

This Bulletin provides information on the cause and appearance of each disorder, its economic significance, and how to treat or prevent it. Producers who need further information should contact a veterinarian.

Producers can use this information to help them improve the health, welfare and production of their stock, for their own and their industry’s benefit. Many stock disorders seen in abattoirs are not encountered by producers in their day-to-day handling and management of livestock.

Some disorders cause economic loss on the farm, for example cheesy gland causes a 4 to 7 per cent loss in clean fleece weight.

Other conditions result in additional costs to the industry as a whole, for example, sheep measles and bladder worm, which increase meat inspection costs. Other conditions such as pink eye or fractures can be painful and distressing to affected animals.

The control of animal disorders named in this Bulletin will benefit both the sheep and cattle industries.

Dr M.D. Carroll
Director General of Agriculture

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Note: Mention of trade names does not imply endorsement or preference of any company’s product by the Department of Agriculture, and any omission of a trade name is unintentional. Recommendations are current at the time of printing.
Sheep disorders
Arthritis

Arthritis is a bacterial inflammation of one or several joints (polyarthritis) in young sheep.

**Cause**

The most common bacterium isolated from infected joints in Western Australian sheep is *Erysipelothrix rhusiopathiae*. This bacterium also causes Erysipelas in pigs. Bacteria enter the blood stream through wounds, usually at marking or shearing, and travel to the joints where they cause inflammation.

**What it looks like**

Animals with acute arthritis show severe lameness, swollen and hot joint(s), and often loss of condition. Chronic arthritis is seen as lameness but no swelling or heat. Lambs are more commonly affected than older sheep.

**Cost**

Losses due to arthritis include culling of affected animals, poor growth rate, possible death and rejection at saleyards of affected sheep and downgrading or condemnation of carcases at abattoirs.
The prevalence of arthritis varies between properties. Robb Jetty abattoir reports an average level of about 1 per cent but some lines have shown up to 27 per cent of lambs affected.

**How to treat it**

Treatment with antibiotics is not usually practical or economical.

**How to prevent it**

Improve hygiene so that bacterial numbers in the environment are minimised and skin wounds are as clean as possible.

**Precautions:**

- Use temporary yards to mark and mules lambs. Use a different paddock each year.
- Use clean, sharp instruments and disinfect before and during use.
- Make up a new batch of disinfectant regularly or when the solution becomes slightly dirty.

Vaccination of ewes against Erysipelas to pass on protection to lambs may be economic if the arthritis problem is severe.

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**GOOD ON YOU, DARL. THAT COPPER BRACELET IS JUST THE SHOT.**
**Bladder worm**

The bladder worm is so-called, not because it is found in the bladder of sheep, but because the worm forms a fluid-filled cyst that looks like a bladder when found at slaughter.

**Cause**

The bladder worm, *Cystercercus tenuicollis*, is the larval stage of the dog tapeworm *Taenia hydatigena*. The adult tapeworm lives in the intestines of dogs, foxes and dingoes, and can be up to 50 cm long. Pastures become contaminated with egg-containing segments of the tapeworm – these resemble grains of rice in the dog’s faeces.

After grazing animals ingest the segments, released eggs hatch into larval stages of the tapeworm. These burrow through the intestinal wall into the bloodstream and pass to the liver where they form fluid-filled cysts. Occasionally, the worms pass through the liver and lodge in other parts of the body including the lungs. The life cycle of the worm is completed when a dog ingests living cysts from the liver or abdominal cavity of a sheep.

**What it looks like**

Generally, infested sheep do not show signs of ill health. In the early stages, heavy infestations may
produce serious liver damage and ill health as the parasites burrow through the liver. Some cysts do not develop fully and only result in a small, pale area on the liver. Others degenerate producing small, soft or hard lumps in the liver. Bladder worm cysts, which can measure 5 cm in diameter and are filled with a watery fluid, contain the worm head.

The adult tapeworm causes no harm to the dog, fox or dingo.

Cost
Organs containing cysts will be condemned at abattoirs. Production losses are possible if a high proportion of lambs are affected.

How to treat it
There is no effective treatment for the parasite in sheep. Dogs can be given an approved worm treatment to kill the tapeworm.

How to prevent it
Several measures will prevent sheep becoming infected:

• Do not feed liver, lungs or intestines of sheep to dogs.

• Treat dogs every two months with an approved tapeworm treatment, such as those which contain the drug praziquantel.

• Boil all sheep meat fed to dogs for 40 minutes or freeze for seven days at -10°C.

• Control foxes and dingoes to reduce paddock contamination with worm eggs.

• Burn sheep carcasses as soon after death as possible.
**Bruising**

A bruise is the result of bleeding in the skin or deeper tissues, especially in muscles of animals. Bruises are rarely seen in live sheep but they are usually visible when sheep are killed and dressed.

**Cause**

A bruise develops when blood vessels are ruptured and blood escapes into surrounding tissues. It is usually caused from hitting or being hit by a hard object on the farm during yarding or transport, and sometimes in the lairage at the abattoir. Sheep in short wool or in poor condition are more susceptible to bruising.

**Cost**

In time, most bruises heal without permanent damage to the animal. Carcasses with bruises that have occurred within a few days of slaughter must be trimmed and downgraded.

In Western Australia, bruising affects less than 1 per cent of slaughtered sheep.

**How to treat it**

Treatment of affected animals is not feasible because they have been presented for slaughter. Prevention is the best option.
**How to prevent it**

Prevent bruising by good management and handling of sheep during the few days before slaughter. Likely causes of bruising on the farm are aggressive yard dogs, misuse of goads (sticks or polypipe) and yards or races with protruding bolts or rails.

If sheep appear to have bruised during transport, consider using a different stock transporter. Use a direct selling system such as on-farm or direct consignment to an abattoir to reduce handling of sheep.
Cheesy gland
(caseous lymphadenitis, CLA, yolk or shearer's boils)

Although cheesy gland is a common disease of sheep in Western Australia, few symptoms of the disease are seen by farmers. Occasionally, an abscess may be cut at shearing or is seen in sheep killed on the farm.

Cause

Cheesy gland affects sheep and goats and is caused by the bacterium Corynebacterium pseudotuberculosis.

The bacteria cause abscesses in the internal organs and lymph nodes.

What it looks like

Cheesy gland abscesses are most commonly seen in the lymph nodes in the shoulder, the flank or under the jaw of sheep. Abscesses are also found in the lungs and occasionally in other organs such as the kidneys, liver or testes.
Cost

In an average unvaccinated flock 35 to 45 per cent of sheep over two-years-old will have cheesy gland, causing about $15 to $20 million in lost wool production in Australia each year. It also causes losses to the Australian sheep meat industry of $10 million in inspection costs, $1 million in condemned carcasses and an unknown figure in trimming and mutton market restrictions.

In an average sheep flock, the cost of cheesy gland will be between 25 cents and 35 cents a sheep each year.

How to treat it

The disease cannot be treated effectively.

How to prevent it

Vaccination is the most effective way to decrease the incidence of cheesy gland. An effective vaccination program starts with two doses given to lambs, ideally six weeks apart. The most convenient way is to give one dose at marking and a second at weaning.

Yearly boosters for mature sheep are essential for protection against cheesy gland. A study has shown that 85 per cent of the spread of the disease occurs following the second and third shearings. Time yearly boosters to provide peak protection at shearing. In general, vaccinate sheep shorn in autumn at the summer drenching. Give spring-shorn sheep a booster when lambs are marked or weaned, or at crutching, depending on the protection against pulpy kidney that needs to be passed from ewes to lambs.

For more detailed information on cheesy gland, see Farmnote No. 54/92 ‘Cheesy gland in sheep and goats’ Agdex 400/653.
Grass seed infestation

Grass seed infestation develops when grass seeds lodge on the sheep and penetrate the skin, resulting in irritation and infection.

**Cause**
Barley, corkscrew, spear, silver and wire grasses can cause severe infestations in sheep, especially in lambs and weaners.

**What it looks like**
As well as accumulating in the fleece and penetrating the skin, seeds may cause damage to eyes, ears, mouth, nostrils, vulva and the skin between the toes. High density of seeds in the fleece irritates the skin and sheep are reluctant to walk. Skin penetration allows bacteria to enter, particularly after dipping, and this may result in infections of tetanus and arthritis.

**Cost**
Although heavy grass seed infestations may cause sheep deaths, grass seeds more commonly cause losses arising from ill thrift and reduced wool, skin and carcase values. The average prevalence of grass seed infestation in lambs slaughtered in Western Australia is about 3 per cent, but whole slaughter lines have been affected.
How to treat it

Treatment of sheep with severe grass seed infestation is difficult and time consuming. Remove all seeds from the eyes, mouth, and from between the toes. Heavy seed infestations are best treated by shearing. Do not plunge or shower dip these sheep until wounds have healed.

How to prevent it

Control of grass seed infestation requires forward planning. Prepare pastures with low seed numbers, at least for young sheep, by heavy grazing or herbicide use before seed set in spring. Late lambing will also help control this problem because of the greater grazing pressure in September and October.
Hydatid disease affects sheep, cattle, goats, pigs, kangaroos, wallabies and humans, and part of its life cycle takes place in dogs, foxes and dingoes. Sheep are the most common species affected. This disease is a human health risk in rural communities, especially in children.

Cause

Hydatid disease is caused by the tapeworm, *Echinococcus granulosus*, which lives in the small intestines of dogs, foxes and dingoes. The adult tapeworm produces eggs which contaminate pastures through the dog’s faeces. Grazing animals may ingest the eggs, which later develop into cysts.

What it looks like

Infected animals show no external signs of infection. Hydatid cysts are found in the liver, although they can also develop in the lungs. The fluid-filled, bladder-like cysts can grow to the size of a golf ball. The fluid contains many thousands of immature tapeworms.

Cost

The human health risk is a major concern with this disease because it can cause death if the cysts are not surgically removed. Hydatid cysts also result in downgrading and rejection of livestock products at abattoirs.
Life cycle of the hydatid tapeworm

The hydatid tapeworm is 5 mm long

Infectious eggs in dog's droppings - tiny sticky eggs can survive in water or dust for months

Dogs eat offal with cysts containing tiny tapeworms

Adult tapeworms in definitive host - the dog. Inside the dog's intestine the adult tapeworms mature in 6-8 weeks to an average length of 5 mm and can lay thousands of eggs which are passed in the dog's droppings.

People can accidentally ingest eggs which are carried by the bloodstream to the liver, lungs, and other organs and develop into cysts which can be fatal

Cysts in intermediate hosts. Grazing animals pick up eggs from contaminated pastures. Cysts form in liver, lung, heart and brain of sheep, cattle, pigs, goats, wallabies and kangaroos.

How to treat it

Infected animals are not usually recognised and therefore are not treated. Prevention is the best option.

How to prevent it

Boil meat and offal fed to dogs for at least 40 minutes or freeze at -10°C for seven days. Commercial heat-sterilised dog foods (canned or biscuits) are safer than meat. Do not let dogs have access to any raw part of a carcase killed on-farm, including kangaroo and feral pig. Tie up or pen dogs when they are not working. Control foxes and dingoes to reduce paddock contamination with tapeworm eggs. Burn carcases as soon after death as possible.

For further information, see Farmnote No. 4/92 'Hydatid disease' Agdex 633.
Nephritis

Nephritis is a term used to describe inflammation of the kidney, causing kidney dysfunction.

**Cause**

Nephritis may be caused by bacteria such as leptospiira, or by poisonous plants, chemicals, fungal toxins, and oestrogenic clovers.

As well as being associated with liver damage, abortion, still births and lamb deaths, leptospiira bacteria occasionally cause nephritis. Cattle and pigs can pass the leptospiira bacteria onto sheep through their urine. If leptospiira nephritis is suspected, avoid grazing sheep in paddocks where cattle and pigs have had access.

Iceplant, sorrel, dock, doublegee and saltbush often cause nephritis. These plants contain high amounts of oxalate, which binds to calcium and forms crystals in the kidney. The crystals prevent normal kidney function and eventually destroy the kidney. Plants usually contain highest levels of oxalate during summer. Sheep will often eat large amounts of these plants after summer rain or shortly after being put into a paddock containing these plants.

Sheep, especially wethers, when grazing cereal stubbles, are prone to developing crystals in the kidney. The crystals can block the passage of urine and lead to kidney damage. Sometimes, when the passage of urine from the bladder is blocked, it can eventually cause the bladder to burst, resulting
in death. This condition is referred to as ‘water belly’.

What it looks like
There may be no obvious signs of nephritis in a mob of sheep. Some severely affected animals may develop ill thrift, show a lack of appetite or die suddenly. Water belly, seen as a distended abdomen, may be evident in wethers.

Cost
A 2 per cent incidence of nephritis is considered high and the cause should be investigated. Usually, affected kidneys will be condemned but price penalties and carcase condemnation are unlikely. There may be small, but unnoticed production losses in affected animals.

How to treat it
There is no effective treatment for severely affected animals, except to ensure that fresh water is available. Use preventive measures to avoid further stock being affected.

How to prevent it
Investigate the cause of the problem. Introduce sheep gradually to paddocks with plants that contain oxalate. A supply of fresh water is also important.

Provision of a calcium lick can help because the calcium will bind the oxalate in the rumen before it reaches the kidney. Calcium also helps to balance the usual high phosphorus content of cereal grain, thus reducing the incidence of phosphorus crystals.

When sheep graze cereal stubbles a salt lick may encourage them to drink and flush out crystals that may develop. An easily prepared homemade mix is of 40 per cent salt and 60 per cent finely ground limestone.
Pneumonia and/or pleurisy

Pneumonia and/or pleurisy affect individual animals occasionally, but outbreaks involving large numbers have occurred in feedlots. Pneumonia is an inflammation of the lungs whereas pleurisy is an inflammation of the membranes that surround the lungs and line the chest cavity.

Cause

Pneumonia and pleurisy may result from viruses, bacteria, fungi, worms, grass seeds, allergic reactions, injuries and poisons. Most cases develop from organisms that are either breathed into the lungs or that are moving in the bloodstream.

Stress will increase the likelihood of an animal developing pneumonia or pleurisy. Lambs are more susceptible than adult sheep.
What it looks like
Symptoms include coughing, open-mouthed breathing, nasal discharge, loss of appetite and fever. Mildly affected animals may show only slightly lowered body weight gains and lowered wool production. Some animals may die if more than 70 per cent of the lungs are diseased and non-functional.

Cost
Pneumonia and pleurisy will reduce wool and meat production, and increase the flock’s susceptibility to other diseases. Carcasses are not usually condemned for this condition, but with pleurisy the chest cavity usually has to be boned out.

How to treat it
Investigation by a veterinarian is recommended if more than about 10 per cent of a flock is showing signs of pneumonia or pleurisy.

How to prevent it
Reducing stress will decrease the risk of pneumonia or pleurisy. Maintaining good hygiene, good nutrition, avoiding over-crowding, exposure to extremes of weather and mixing of different lines of sheep will also help.
Sarcosporidiosis

Sarcosporidiosis is a condition caused by a parasite of sheep, cattle, pigs and goats, with part of its life cycle occurring in dogs, foxes and cats.

**Cause**

This condition is caused by a microscopic protozoan, *Sarcocystis*. Sheep and cattle become infected by ingesting the protozoan eggs that are present in the faeces of infected dogs. Once in the intestine of sheep or cattle, the eggs release sporozoites that invade other tissues, multiply and develop further in the muscles to become the next stage, called sarcocysts.

Dogs become re-infected with the protozoan when they eat muscle or organs from a sheep or cow containing the sarcocysts. The life cycle is completed when the parasite undergoes final development and releases oocysts into the faeces of the dog.

**What it looks like**

Sarcosporidiosis is seen as small, pale streaks in the muscles and organs. The cysts can be microscopic or up to 5 cm in diameter. They are usually found in the oesophagus, heart, kidney and skeletal muscles. Larger cysts are normally found at the base of the oesophagus and in
the heart, and these lesions are recorded by meat inspectors.

Sarcocystis has been associated with loss of appetite, anaemia, staggering and abortion in sheep. Infections are more common in older animals. On rare occasions clinical signs have been reported in cattle infected with sarcocystis. These signs include loss of appetite, anaemia, wasting, excessive salivation and meningitis.

**Cost**

Severe infection can cause production losses. If five or more cysts are seen in a mutton or cattle carcase, it is rejected for export. Carcases with generalised infections are condemned.

**How to prevent it**

The risk of this disease can be reduced by preventing dogs, cats and foxes from eating raw meat, including dead livestock. Boil all meat fed to dogs and cats for at least 40 minutes or freeze at -10°C for seven days.

Do not let dogs have access to any raw part of a carcase butchered on-farm and tie up or pen dogs when they are not being worked to prevent scavenging. Control feral cats and foxes. Where an outbreak has occurred, do not let dogs have access to pastures grazed by sheep and cattle.

**How to treat it**

There is no practical treatment for sarcocystis; prevention being the only option.
Sheep measles
(*Cystercercus ovis*)

Sheep measles are small cysts, about 5 mm long.

**Cause**

Sheep measles cysts are the intermediate stage of a large tapeworm called *Taenia ovis*, found in the intestine of dogs or foxes. Eggs from the tapeworm are passed by the dog onto pasture and if conditions are moist and mild, the eggs may survive for up to a year.

Sheep become infected as they graze pasture containing worm eggs. The eggs then hatch in the intestine to release immature worms that penetrate the wall of the gut and enter the bloodstream. The tiny worms develop in muscles, forming small cysts (measles), each one containing the head of one tapeworm.

Dogs or foxes become infested with the tapeworm by eating sheep meat containing live measles cysts. If an animal dies in the paddock and the carcase remains intact, the cyst will also die after three days.
An adult tapeworm can develop in the intestine of a dog in about two months. Most dogs carry a single worm but sometimes two worms may be present. Each worm can be more than a metre long and is divided into 200 to 300 segments, each containing about 80,000 eggs when mature. The tapeworm may live in a dog for about nine months.

*What it looks like*

Sheep infected with sheep measles will not show any abnormal signs. Most of the cysts break down after three or four months but they leave thick, fibrous lumps that often become calcified and gritty. These lumps are known as measles when scattered through the meat.

Dogs infested with the sheep measles tapeworm will usually show no outward signs of ill health. The tapeworm segments look like grains of rice and may be seen in the dog’s faeces. Other types of tapeworms that are spread by fleas, also have eggs that look like grains of rice.

*Cost*

Sheep measles results in rejection of meat for export. Severe infections may cause production losses. If a person ate a measles cyst, he or she would not develop sheep measles.

*How to treat it*

There is no practical treatment for stock infected with sheep measles.

*How to prevent it*

Several measures can be taken to prevent sheep measles from being transferred to sheep.

*•* Boil meat and offal fed to dogs for at least 40 minutes or freeze at -10°C for seven days. Do not let dogs have
access to any raw part of a carcase butchered on-farm.

- Tie up or pen dogs when they are not being worked to prevent scavenging.

- Treat dogs every two months with an approved worm treatment containing the drug praziquantel.

- Control foxes and dingoes to reduce paddock contamination with tapeworm eggs.

- Burn sheep carcases as soon after death as possible.

**Note:** Tapeworms become adult in the intestine of the dog about six weeks after the cyst is eaten, but for the first two or three weeks of this time, tapeworms are resistant to any form of worm dose. Thus, even if dogs are being dosed every six weeks, some worms may still be laying eggs before the next dosing.
Small fibrotic liver

A small fibrotic liver is smaller and firmer than normal, which indicates the liver has been damaged – usually from poisoning.

Cause

The most common cause of liver damage is lupinosia. This disease is most common in summer and autumn.

Lupinosia is caused by a toxin produced by a fungus (*Phomopsis* spp.) which colonises the dead lupin plant. Toxin produced by the fungus increases during warm moist conditions, therefore summer rain may make the lupin stubble more toxic.

In flocks severely affected by lupinosia a large proportion of the sheep may die and there may be a significant production loss in those that survive.

Another less common cause of small fibrotic liver is facial eczema, which most often occurs in autumn. This disease is also caused by a fungal toxin and occurs sporadically south of Wongan Hills. Major outbreaks with large stock losses can occur in southern coastal areas. Moist and humid weather followed by warm nights and mild days favour growth of the fungus and production of the toxin. The fungus grows on dead
SHEEP

pasture litter of a wide range of grasses and legumes. Lambs and breeding ewes are more commonly affected than wethers or rams.

Other causes of small fibrotic liver include migration of worm larvae, ingestion of heliotrope, and Paterson’s curse plants. Both these plants contain pyrrolizidine alkaloids – compounds that damage the liver.

A trauma such as bruising may also result in a small fibrotic liver.

What it looks like

Often animals suffering these conditions will show no symptoms or just mild weight loss as if feed was running out. Some animals suffering lupinosis may show weakness, loss of condition, and jaundice (yellowing of the gums and eyes). Affected animals may die within a period of two days to several weeks after being put into paddocks containing Phomopsis-infected lupin stubble, and may continue to die after being removed from stubbles.

At post mortem, the liver can be swollen and bright orange/yellow, and the fat of the carcase may be yellow. This is seen in animals that have consumed a lot of the fungal toxin over a short period, for example, within the first two weeks of being put onto a very toxic lupin stubble. In chronic cases, sheep may have shown no obvious signs but at post mortem are likely to have a small fibrotic liver.
Facial eczema can also cause jaundice. Affected animals will show a swelling of the head, and skin damage with many scabs may occur. These are signs that the animal has become highly sensitive to sunlight.

Poisoning with pyrrolizidine alkaloids will cause jaundice, loss of condition, weakness and death. 'Red water' (red urine) may also be seen. This is a symptom of copper poisoning. The high copper levels also contribute greatly to the jaundice which often isn’t a real feature of poisoning by pyrrolizidine alkaloids alone. In Western Australia, most small fibrotic liver cases arising from poisoning by pyrrolizidine alkaloids are from subclinical-type (symptoms are not evident) intoxication.

Cost
Liver damage may lead to losses by culling of affected animals, poor growth rate, possible death and rejection of affected livers at abattoirs.

How to treat it
Specific treatment is not practical but if ingestion of a toxin is suspected, then access to that toxin must be prevented immediately. Give recovering animals easy access to hay and water. Do not give them lupin seed or legume hay because those feeds contain too much protein for the damaged liver to handle.

Remove animals affected by facial eczema from the paddock and provide them with shelter to avoid exposure to sunlight. Give them good quality hay initially, but do not provide them with feed of a high protein content.

How to prevent it
Lupinosis
- Graze stock on Phomopsis-resistant lupins such as Yorrel
and Gungurru, and check stock for signs of lupinosis as the disease may still occur. If the disease occurs, remove the mob onto cereal stubble.

- Graze lupin stubble before cereal stubble because summer rains may cause increased levels of toxicity in the lupin stubble. Do not put hungry sheep onto lupin stubble as they are likely to eat more of the stems than the seed. Feed lupin seed to young stock before putting them into a lupin stubble so they will be more likely to eat the seed rather than stems.

- Do not graze lupin stubbles for long periods. If the amount of seed is low, remove the sheep.

For further information, see Farmnote No. 109/88 ‘Grazing management to minimise lupinosis’ Agdex 430/652

**Facial eczema**

- In New Zealand, where facial eczema is a major problem, fungicides are used to spray paddocks. This is not recommended in Western Australia because the condition seldom occurs.

- Giving doses of zinc to animals that are about to graze an affected paddock has been successful in preventing outbreaks of the disease. However, you should check on correct dosage with your veterinarian because zinc in large doses can be toxic to animals.
Vaccination abscess (inoculation abscess)

Vaccination abscess is a lump or abscess, usually at the site of vaccination.

**Cause**

Vaccination with a dirty needle can cause a bacterial infection. Common sites are muscle of the leg or back.

**What it looks like**

Most lumps or abscesses will only be seen in carcasses and few, if any signs, will be seen by farmers. Occasionally, the lump may be cut at shearing. Sometimes sheep become lame when injected into muscle.

**Cost**

This condition often affects the most valuable parts of the carcase. The affected carcase is trimmed and downgraded, and may lose a quarter to a half of its value, particularly for lambs. In lambs, this is a direct loss to the producer. Abscesses on heads are not downgraded.

About a fifth of lamb lines killed at Robb Jetty have vaccination abscesses. Within these lines about 7 per cent of lambs are affected. Up to 80 per cent of some lines may require trimming.
SHEEP

How to treat it

There is no practical treatment for vaccination abscesses. A cut abscess will heal naturally, if drained and cleaned.

How to prevent it

Vaccinate sheep in the loose skin behind the ear or in the cheek. Change needles used for vaccination after every 100 to 200 sheep. Sterilise needles in disinfectant or methylated spirits after every 40 to 60 sheep.
Actinomycosis (lumpy jaw)

Actinomycosis usually affects the jaw in cattle, hence the name lumpy jaw. Occasionally, the tongue, lungs and intestinal tract can also be affected. The disease is not common.

**Cause**

The bacteria, *Actinomyces bovis*, is a normal inhabitant of the cow’s mouth and infection occurs when the lining of the mouth is damaged by either rough food or emerging teeth. Infection localises in the bone of the jaw, causing problems with feeding and chewing. Infection between animals is not likely and outbreaks are usually confined to small numbers of cattle.

**What it looks like**

Lumpy jaw usually starts as a painless bony swelling of the jaw at the level of the molar teeth. The lump grows at a variable rate, often slowly, and becomes hard and painful. It may burst and discharge a sticky fluid with white or yellow granules. The lesion may then heal and burst again at a later date. If not treated, teeth in the area become affected. Cattle suffering from lumpy jaw have difficulty chewing, lose weight, and usually have to be destroyed.
Cost

Severely affected animals will lose weight and may need to be destroyed. Animals found to be affected at the abattoir are condemned.

*How to treat it*

The disease can be treated with antibiotics. However, treatment is often not successful, especially if the infection is localised in bony tissue. Consult your veterinarian.

*How to prevent it*

There are no specific prevention measures. Preventing access to food likely to traumatisethe mouth may be warranted.
Arthritis

Arthritis is a combination of inflammation and degeneration of the tissues associated with a joint.

Cause
The causes of arthritis are varied and usually affect only individual animals in a herd. If several animals are affected, conduct a full investigation to determine the cause.

The two most common causes of arthritis are infection and trauma. Infectious arthritis is often secondary to infection of the navel at or soon after birth. Wounds, metritis, mastitis or pneumonia may also lead to arthritis.

Trauma usually leads to arthritis in one joint. Chronic or repeated trauma causes damage of the cartilage in the joints and scarring of the joint capsule. As a result, the bone around the joint often becomes overgrown in an attempt to protect the joint. This condition is common in the stifle (knee joint of the hind leg) and hock of old cattle. In young bulls, it may be the result of an inherited weakness.

Calcium and phosphorus deficiency can lead to bones becoming weakened and chronic arthritis. Fluoride poisoning from some rock phosphate
supplements has produced similar problems but this condition is rare.

What it looks like
In its early stages, arthritis is first noticed as lameness. Usually several joints are painful, showing signs of swelling and heat, and there may also be an accumulation of pus. Later, the swelling and pain may subside, but the tissues around the joint and cartilage remain scarred.

Some animals may have arthritis but do not show symptoms.

Cost
Affected animals may show reduced growth and production. Infected animals may need to be slaughtered immediately, while others may be culled at an age younger than normal. If an animal shows several joints are affected, parts of or the whole carcase may be condemned.

How to treat it
Antibiotics are not effective at treating joint infections, so that once arthritis has established, treatment is often unsuccessful.

How to prevent it
Prevention involves providing a clean, dry environment for calving cows, dipping the navel cords of newborn calves with disinfectant, and treating other infections from wounds before they spread to the joints.

Facilities less likely to cause trauma, such as well designed yards, laneways, and crusher will help reduce the incidence of arthritis if trauma is found to be the cause.
Bruising

Bruising is a significant cost for the cattle industry because bruises must be trimmed from carcases for human consumption.

Cause
A bruise develops when blood vessels are ruptured, after hitting or being hit by a hard object during transport and from handling in yards. When bruising takes place, blood escapes into surrounding tissues. Horns cause nearly half of all bruises.

What it looks like
Bruises are difficult to recognise in many live cattle but they are easily seen when the animal is killed and dressed. Bruises appear as a dark discolouration of the meat. A recent bruise will be blood-red whereas an old bruise will be much darker.

Cost
In time, most bruises heal without permanent damage to the animal. Carcases bruised a few days before slaughter must be trimmed and downgraded. Badly bruised carcases may be condemned.

Bruising is estimated to cost the cattle meat industry $30 million each year. The extra labour and time needed to handle
bruised carcases are wasteful costs to the industry.

How to treat it
There is no practical treatment, prevention being the best option.

How to prevent it
Bruising in slaughter cattle can be minimised by good management.

- Ensure good yard design with regular maintenance (remove protruding bolts or rails).
- Take care during transport and avoid overloading trucks.
- Ensure quiet handling, avoid aggressive dogs and do not misuse goads.
- Dehorn young cattle or breed polled cattle.
- Use computer aided livestock marketing (CALM).

In addition, avoid mixing horned and hornless cattle because butchers pay premiums for pens of hornless cattle that have a lower incidence of bruising. The practice of 'tipping the horns' does not eliminate bruising.
Cancer eye

Cancer eye is the common name for a scaly cancer of the eye referred to as a squamous cell carcinoma. A squamous cell is flat and looks like a scale, and a carcinoma is a type of malignant cancer.

Cause

This condition can begin with a papilloma virus causing a small wart on the eye and this grows with exposure to sunlight. Cancer eye is most commonly seen in cattle with non-pigmented (white) skin around their eyes, hence it is most common in Herefords and Hereford cross cattle, and to a lesser extent Ayrshires, Friesians and Simmentals. Cancer eye is more common in cattle more than four years old.

What it looks like

Cancer eye occurs in three places:

- On the eyeball itself, where the white of the eye attaches to the conjunctiva or pink part of the eye.

- On the eyelids, particularly where the eyelids are white.

- On the third eyelid that moves across the eyeball, on the free edge of the eyelid that is exposed to sunlight.
The cancer is fast growing and as it progresses through the eye it develops its own blood vessels. The initial sign is often a small white spot on the eye that grows with time until the eyeball and socket are distorted and the animal blinded.

Cancer eye can quickly spread, particularly if it starts on the eyelids. In a matter of months the cancer can spread into lymph nodes, bones and the lungs.

Cost
Cattle with one or both eyes affected may suffer production losses caused by accidents, poor grazing ability and 'fly worry' of affected eyes.

Cattle with this condition cannot be slaughtered in export abattoirs and in other abattoirs affected cattle may be condemned.

How to treat it
Initial cancer eye lesions will often subside, but others may develop rapidly. Seek veterinary advice. Small lesions can be removed by cauterisation. Larger lesions are treated by surgically removing the affected portion of eyelid or the entire eyeball.

How to prevent it
Careful breeding can limit this disease in a herd. Bos indicus cattle always have pigmented eyelids and a smaller incidence of eye cancer, so cross breeding with these breeds can be a solution. Selection of heifers with pigment around the eyes is also worthwhile.
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Fatty liver

Fatty liver (and kidney) syndrome is most often seen in breeding cows in the last month of pregnancy or shortly after the calf is born. Other names for this syndrome include pregnancy toxaemia or fat cow syndrome.

Cause

Fatty liver syndrome is a metabolic disturbance often associated with an incident that reduces feed intake for a period of time during late pregnancy or early lactation, for example, a displaced abomasum (fourth stomach).

Fatty liver syndrome is commonly associated with twin pregnancies and first-calf heifers. It is usually seen in fat cows or in heavily pregnant cows on poor pasture.

What it looks like

Affected cows will show reduced appetite, lower milk production and the rumen stops functioning. The animal is usually weak and sometimes falls down. The name of the disease comes from the appearance of the liver at post-mortem. The liver is enlarged, yellow or orange, breaks easily and feels greasy to the touch because of the large amount of fat it contains.
Cost

Affected livers can be condemned. The most important consequence of fatty liver is that affected animals often die. If cows are lactating, the calf may lose condition and die.

How to treat it

Affected animals need urgent veterinary attention but often their response to treatment is poor. Cows that have fallen down are unlikely to recover.

How to prevent it

Prevention is best achieved by keeping animals in moderate body condition and by ensuring a continuous feed supply during pregnancy and early lactation.
Granuloma

Granuloma is a general term for a type of lump found in soft tissue. This condition is often caused by the disease actinobacillosis, which usually affects the tongues of cattle, hence the common name wooden tongue.

Other granulomas may be caused by tuberculosis, parasites, fungi, cancer, foreign bodies such as grass seeds, and a number of bacteria. If at slaughter, the granuloma(s) found in your cattle are caused by tuberculosis, you will be notified by the Department of Agriculture.

Cause
The causes of granulomas are numerous and special laboratory examinations are necessary for diagnosis. It is most important that the granulomas are examined to make sure an animal is not infected with tuberculosis.

Cost
Some animals found at slaughter may be condemned if they have tuberculosis, systemic cancer or some other bacterial infection. Animals severely affected by wooden tongue lose weight and may need to be destroyed.
Tuberculosis is now relatively rare in Australian cattle because of the years of work and millions of dollars spent on eradicating the disease. This effort has been necessary to protect Australian export markets and the health of the human population. For these reasons it is essential that granulomas be examined (even if of minor importance themselves) in the continual watch for tuberculosis.

If tuberculosis is diagnosed in the laboratory, you will be contacted by the Department of Agriculture.
Hardware disease

Hardware disease is often seen as an infection or abscess between the first stomach and the diaphragm.

Cause

Hardware disease is caused by penetration of the rumen (paunch or first stomach) by a piece of wire or nail that has been swallowed.

What it looks like

Many cattle develop peritonitis without obvious signs of illness. Some show a transient ill thrift and recover, while others develop chronic wasting and can die. Hardware disease is seen as adhesions of scar tissue in the stomachs and amongst the intestines of the abdominal cavity.

Cost

Affected animals may have reduced weight gains compared with unaffected stock.

How to treat it

Treatment of initial cases involves antibiotics and isolation in a yard. For valuable stock, surgery to remove the wire may be necessary. Your veterinarian should be contacted as soon as you suspect a case. There is no treatment for long-standing cases of hardware
disease and affected cattle will usually become chronic poor performers.

**How to prevent it**

Clearing up after fencing and preventing wire entering from hammer mills will reduce the risks. Magnets administered by mouth have been used overseas to protect against peritonitis caused by wire but they are generally not cost effective in Australian herds.
Healed fractures

Fractures are fairly common in all age groups of cattle. Usually, only individual animals are affected.

**Cause**

Fractures normally result from a trauma that can be caused by slippery floors, fights, rough handling or excessive activity during oestrus. Cattle yards that have sharp corners or bolts and rails projecting into the raceway contribute to the incidence of fractures.

Calcium and phosphorus deficiency can lead to weakened bones that are more likely to fracture. These deficiencies also cause delayed healing of fractures and the fracture becomes surrounded with a mass of fibrous tissue.

**What it looks like**

If a fracture is mild, lameness may be seen for a week or two and then normal function returns. If several animals are showing signs of lameness, particularly at the points of the hips and shoulders, check the handling yards for protrusions.

**Cost**

Mild fractures may result in bruising and tissue damage, leading to trimming at the abattoir. If a fracture is severe, then
the animal may need to be quickly and humanely destroyed.

*How to treat it*

Usually there is no practical treatment for fractures in cattle. Seek veterinary advice for individual cases. However, slaughter is usually the only practical option.

*How to prevent it*

Close observation and maintenance of yards, races and gates is important. Steady handling when mustering, yarding and transporting cattle is essential.
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Hydatid disease

See Hydatid disease in sheep on page 12.

Jaundice

Jaundice is a common symptom of a number of disorders. It is a term given to yellow skin, gums, eyes and internal organs, especially the liver and the fat of the carcase.

Cause

The yellowing of tissues is caused by high levels of a substance called bilirubin in the blood. Bilirubin is produced when the red blood cells die and it is normally metabolised in the liver, becoming part of the bile. Jaundice occurs when the liver is unable to metabolise the bilirubin. This occurs when red blood cells are being destroyed at a greater rate than normal due to bracken fern poisoning, chronic copper poisoning, snake bite or leptospirosis (See Nephritis on page 54).

Bilirubin may also build up in the blood when the bile duct is blocked or damaged from liver disease caused by toxins from blue-green algae, fungal toxins, poisonous plants (Crotalaria, Heliotropium), leptospirosis, and occasionally abscesses, tumours, or lupinosis.

What it looks like

Jaundice is seen as a yellowing of the whites of the eyes, and of the skin and gums. If the liver is
badly affected there may be loss of appetite and weight loss. Pale gums and red urine may also be apparent if the jaundice is caused by a rapid breakdown of red blood cells.

Cost
Cattle with signs of jaundice may suffer considerable production losses. Jaundiced livers will be condemned at the abattoir, and if the carcase fat is very yellow, the whole carcase may be condemned.

How to treat it
There is no specific treatment for jaundice except to provide good quality feed and water. The cause of the jaundice must be determined and rectified. Consult your veterinarian as soon as possible as an early investigation could save large production losses.

How to prevent it
The risk of liver damage can be reduced by preventing access to excess copper, and poisonous plants, including toxic algae, and vaccinating against leptospirosis.
Liver abscess

Liver abscess in cattle is often associated with high grain and low roughage diets, and is seen most frequently in feedlot cattle.

Caution

High grain and low roughage diets cause high acid conditions in the rumen (paunch or first stomach) that can damage the rumen wall. This allows bacteria to move through the blood stream to the liver. Injury to the rumen wall from penetrating grass seed awns is another cause of liver abscess.

What it looks like

In most cases there is no measurable effect on health or weight gains. However, many cattle with large and/or multiple abscesses can suffer ill thrift. Rumenitis and other digestive disturbances are often associated with liver abscesses. These are also caused by high grain and low roughage diets and cause ill thrift.
Cost

The major cost of liver abscess is the condemnation of livers at abattoirs.

How to treat it

There is no practical treatment available.

How to prevent it

The incidence of liver abscesses in cattle can be reduced by increasing the amount of roughage in the diet. Seek advice on ration formulation and the procedure for slowly increasing the level of concentrates when feeding grain to cattle.
Malignancy

Malignancy is a term used to describe tumours or cancers that develop when the cells of a tissue or body organ grow excessively.

Tumours often refer to excessive growth of tissues such as bone or liver, whereas cancers usually refer to excessive growth of cells, such as white blood cells – as in the case of leukaemia. In most situations, tumours develop in individual animals infrequently, however some tumours may affect a number of animals in a herd.

Cause

The cause of most cancers is not known, although several factors have been incriminated including viruses, exposure to certain chemicals, sunlight and low immunity. Cancer eye is the most common tumour of cattle, and is discussed on page 36.

Two other cattle tumours are neurofibroma and bovine leukaemia (bovine viral leukosis). Neuro means nerve tissue and fibroma means fibrous tissue. It is thought that the condition is passed from cow to calf.
Bovine leukaemia is a tumour of the immune system of cattle, caused by a virus that may be spread by biting insects. Not all cattle infected by the virus develop the disease, perhaps because of differences in genetic predisposition. Bovine leukaemia is not common in Western Australia.

**What it looks like**
Most malignancies will be seen as an abnormal growth or swelling of a particular organ or tissue. Neurofibroma is excessive growth of the nerve endings and results in a swelling under the skin. Animals affected with bovine leukaemia show loss of condition and appetite, anaemia and muscular weakness. Sometimes diarrhoea is also present.

**Cost**
Production losses associated with malignancy vary, depending on the type of tumour, but they are rarely significant on a herd basis. Losses occur when part or all of the carcase is condemned.

**How to treat it**
Treatment for cancers is generally fruitless.

**How to prevent it**
Certain cancers can be prevented by reducing or eliminating the risk factors, if they are known. For cancers that are transmitted through an infectious agent, identify and destroy infected animals. Seek veterinary advice.
Metritis

Metritis is an infection of the uterus. In cows it is almost always caused by the persistence of infections acquired at or soon after calving.

Cause

Many different bacteria cause metritis. After calving, the uterus is left with a mix of foetal fluids, blood, mucus and parts of the lining of the uterus. This is known collectively as lochia and is an ideal medium for bacterial growth.

One out of every two cows will have an infection of the uterus after calving, however this decreases to about one in ten after about six weeks. Most of the lochia is expelled by the cow within two weeks of calving.

However, cows that have dietary imbalances, particularly lack of energy, calcium, phosphorus and other minerals, cannot expel the lochia.

What it looks like

Usually few signs of disease are seen in cows. However, if a severe infection has established, feed intake is reduced and cows become lethargic.

Metritis causes infertility. Some infected animals become repeat breeders or they may not be seen to
cycle at all. At the abattoir, the uterus is enlarged and contains foul-smelling fluid and sometimes, pus.

Cost
Metritis can result in a reduction in the overall reproductive performance of the herd. Some animals may require treatment, so consider the cost of veterinary fees and drugs. There are no penalties from the abattoir for metritis.

How to treat it
Treatment involves two steps: removal of the infection in the uterus and the induction of normal oestrous cycling activity. Drugs needed are only available from a veterinarian.

How to prevent it
Prevention involves carrying out a detailed analysis of herd production data, breeding records and diet. It is worthwhile arranging a veterinary examination of all cows that have an abnormal calving, that need assistance, or that suffer from a metabolic disease such as milk fever. An examination will identify the problem and ensure that treatment is given quickly.
Nephritis is inflammation of the kidneys. This is usually caused by a bacterial infection.

**Cause**

The most common bacterial agent causing nephritis is leptospirosis. Plants, especially those containing oxalates, may occasionally cause kidney problems.

**What it looks like**

Leptospirosis can affect virtually all animals including humans. In cattle, the disease can range from being very severe to virtually undetectable. The severe form usually affects younger calves which show symptoms of fever, anaemia, blood in the urine and often death. In older cows there may be weight loss, reduced milk production, fever and abortions. Red-coloured urine, termed ‘red water’, may be seen in some cases.

Most herds in Western Australia have been exposed to leptospiral organisms. Many infections pass unnoticed, but outbreaks can be severe, especially in calves and pregnant or lactating cows. Severe outbreaks probably result from an infection being
introduced to an unexposed or unvaccinated herd.

Cost

In Western Australia there are several cases each year of humans who become incapacitated for weeks, sometimes months, because of infection (see special note on page 56).

In an infected herd, leptospirosis causes an increase in abortions and reduced milk production, and young calves may die if severely infected. Affected kidneys are condemned at the abattoir.

How to treat it

Treatment with the antibiotic, streptomycin, early in the disease cycle gives a good response.

How to prevent it

Vaccination gives the best protection. Vaccinate new stock twice in a six-week period before mixing them with other stock. The vaccines available in 1992 are:

- Coopers Leptovax Lepto Pomona/Hardjo ® (Pitman-Moore)
- Lepto for cattle combined® (CSL)
- Hardjo Pomona Vaccine® (CSL)
- Vaxall Lepto PT® (Arthur Webster)
- Vaxall Lepto HP Vaccine for cattle® (Arthur Webster)
- Vaxicare Lepto HP Vaccine for cattle® (SmithKline Beecham)
- Vetvax Leptavoid Lepto Pomona/Hardjo Vaccine® (Pitman-Moore)
- Coopers Cattlevax Combined Lepto and 5-in-1 Vaccine® (Pitman-Moore)
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Pigs are one of the most common carriers of the disease. Isolate cattle and pigs and prevent seepage from piggeries onto grazing paddocks.

Note: The risk of human infection means farmers must be aware of this disease and if they fall ill they should promptly seek medical attention. Leptospirosis in humans usually takes the form of severe influenza-like illness, fever, headache, loss of appetite and a sensitivity to light. Infection commonly enters through cuts and abrasions. Avoid direct contact with cattle urine by wearing protective clothing including rubber boots.

For further information on leptospirosis, see Farmnote No. 19/90 'Leptospirosis in dairy cattle' Agdex 411/653.
Pink eye

Pink eye is a contagious infection of the eye and the name refers to the pink colour seen in an affected eye. This disease may result in temporary blindness or occasionally, permanent eye damage.

**Cause**

Pink eye is caused by the infectious organisms, rickettsia, mycoplasma and chlamydia. Animals that have recovered from a previous infection may carry the disease for up to 200 days and thus introduce pink eye infection to other animals.

Animals grazing tall, dry feed, such as stubbles, are at a high risk.

Handfeeding, yarding animals, and the presence of flies and dust encourage the disease to spread. Pink eye is most commonly seen in summer. Because the organisms that infect cattle and sheep are different, cattle and sheep can not infect one another.

**What it looks like**

In the early stages the tissues around the eyeball become inflamed and red. The eyelids become swollen, the eyes usually water and affected animals blink more often than normal. Usually, both eyes are affected with pink eye;
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one eye before the other. In contrast, grass seeds usually affect one eye.

After a few days the clear part of the eye (cornea) becomes cloudy at the edges and as this disease develops, the cloudiness spreads to cover the entire cornea. Pus may also develop. The whole eye can become white and the animal blinded, and in severe cases ulcers develop on the edge of the cornea, causing the eyeball to collapse.

Cattle suffering from pink eye lose their appetite, have poor weight gains and have reduced milk production. Sometimes, death by accident may result if an animal is totally blind, for example, by stumbling into a dam and drowning. Hereford cattle are the cattle breed most susceptible to pink eye whereas Bos indicus cattle are much less susceptible.

Cost

Animals suffering from pink eye lose their appetite and have poor weight gains. Sometimes, death by accident may result if an animal is totally blind.

How to treat it

In most cases an animal will recover without any treatment in 10 to 14 days. More severe cases may take up to six weeks to heal. Few animals recover from an infection completely, although after recovering they have an immunity that lasts about a year.

The healing process can be aided by applying antibiotic eye preparations that will also help to reduce the spread of pink eye throughout the mob. Affected eyes are very sensitive to light. Put infected animals in a shed and reduce dust and flies. It is not recommended to yard animals to treat severely affected
individuals. It is best to collect those animals from the paddock during a mob inspection.

How to prevent it

Early detection of pink eye will help to reduce its severity and spread. Isolating infected animals early in an outbreak may reduce the spread. If a mob has pink eye and must be yarded, wet down the yards first to reduce the dust level.
Pneumonia and/or pleurisy

Pneumonia and pleurisy occasionally affect individual animals but outbreaks involving large numbers have occurred in feedlots.

Pneumonia is an inflammation of the lungs whereas pleurisy is an inflammation of the membranes that surround the lungs and line the chest cavity.

Cause
Pneumonia and pleurisy may result from viruses, bacteria, fungi, worms, allergic reactions, injuries and poisons. Most cases develop from organisms that are either breathed into the lungs or that are moving in the bloodstream. Stress will increase the likelihood of an animal developing pneumonia or pleurisy, and calves are more susceptible than adult cattle.

What it looks like
Symptoms are coughing, open-mouthed breathing, discharge from the nose, loss of appetite, fever, low body weight gains and low milk production. If more than 70 per cent of the lungs are diseased and non-functional, the animal may die. Some affected cattle may show no symptoms.
Cost

Pneumonia and pleurisy result in reduced meat and milk production and an increased susceptibility to other diseases. Carcases that show pneumonia or pleurisy are not usually condemned.

How to treat it

Immediate veterinary treatment is recommended for animals that show signs of pneumonia and pleurisy.

How to prevent it

Reducing stress will decrease the risk of pneumonia or pleurisy developing. The incidence of these diseases can be reduced by maintaining good hygiene and nutrition, avoiding overcrowding and exposure to extremes of weather, and by mixing different lines of cattle. Care during transportation to minimise stress will help to reduce the risks of pneumonia.
Rumen injection abscess

Rumen injections may cause an abscess in the wall of the rumen.

Cause
Rumen injection abscess is most often caused by misdirected intra-rumenal worm drenches.

What it looks like
Some cattle may show transient ill thrift, however most recover without serious effects.

Cost
The costs of rumen injection abscesses are unknown but are thought to be small.

How to treat it
Treatment is not usually necessary.

How to prevent it
Use the correct intra-rumenal injection technique – as described in product information pamphlets.
Sarcosporidiosis

See Sarcosporidiosis in sheep on page 18.