

Lead poisoning in livestock

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Introduction

Poisoning by toxic chemicals can cause serious stock losses. Historically, lead and arsenic have been the most common causes of inorganic chemical poisoning in farm animals.

It is many years since arsenic was used in sheep and cattle dips or as a herbicide and arsenic poisoning of livestock is now uncommon. However, old products discarded in the farm rubbish tip or forgotten in the farm shed can still cause occasional problems.

Lead is quite a different story as various sources of lead are present and in daily use on most farms. Lead is a persistent chemical in the environment and in stock. It should be taken into account during any on-farm risk assessment for persistent chemicals.

Remember that people, particularly children, can be at risk from lead poisoning as well as farm livestock and other domestic animals.



Figure 1. Lead from broken batteries is easily available to stock.

Lead sources

Old lead acid batteries are the most common cause of lead poisoning in livestock. Battery cases become brittle over time and are easily broken by inquisitive cattle. The lead and lead salts that they contain are easily accessed and readily eaten by stock. One broken tractor battery was reported to have fatally poisoned 28 cattle over several weeks, though a small number of sick animals recovered. Another 200 cattle in the same paddock were unaffected.

Skimmings and 'slag' taken from molten lead during attempts to recover the metal from old batteries are also highly toxic to stock (as well as exposing the operators to health risks).

Other causes of lead poisoning in stock include: licking and eating lead based paint from old paint tins, buildings or other painted materials; eating ashes left after burning old painted materials; eating linoleum; and drinking sump oil. Silage contaminated by lead shot, automotive grease and oil filters, caulking, putty and even access to leadlight windows have also caused fatal lead poisoning in stock.

Other risk factors

Cattle are at most risk of lead poisoning because they are very inquisitive and commonly 'taste test' new finds – including old batteries, flaking lead paint, sump oil, ashes and just about any other potential lead source they come across.

Lead and other heavy materials tend to lodge in the reticulum (fore-stomach) of ruminant animals. This provides a reservoir from which lead can continue to be absorbed into the bodies of cattle, sheep and goats.

Lead in old paint pigments is finely ground and quite soluble. Lead previously exposed to acid conditions in batteries and silage is also more easily absorbed from an animal's gut than clean metallic lead and thus presents a higher poisoning risk.



Figure 2. This weaner was found comatose and died shortly after.

Lead poisoning risks can increase during drought. Hungry stock may develop a depraved appetite (pica), particularly if also suffering trace element or mineral deficiencies. Hungry stock are also more inclined to breaking into 'no-go' areas, such as around farm sheds or the farm rubbish tip where there is some residual feed, or stock may be held in house paddocks to make feeding easier. Less pasture cover makes it more likely that stock will find hazards such as old batteries.

Symptoms

Often the first sign of lead poisoning is finding dead stock – often near a fence or some other obstacle. Where affected animals are observed they show signs of central nervous system damage. They generally cease grazing and appear very dull and unresponsive. They are often blind and may walk aimlessly, including into fences and other obstacles, before becoming comatose and dying.

In some cases these symptoms are accompanied by muscle twitches that may be more obvious around the face, ears and eyelids but can involve any area of the body. Paralysis of the tongue, circling and 'star-gazing' are also reported in some cases.

Immediate veterinary advice should be sought for any livestock showing nervous signs. Lead poisoning can cause symptoms similar to those of other diseases affecting the nervous system including some plant poisonings, PE (polioencephalomalacia) and metabolic diseases like low blood magnesium (hypomagnesaemia or grass tetany).

An accurate early diagnosis is vital to help prevent continuing losses and to determine the appropriate treatment for sick animals.

Diagnosis

Diagnosis of lead poisoning is based primarily on a history of access to lead and the clinical signs. Post-mortem examination will usually reveal lead particles in the reticulum of affected ruminants.

Lead poisoning can be confirmed by testing tissue samples (liver or kidney) taken at post-mortem or by testing blood from live animals. NSW Department of Primary Industries will pay the cost of testing up to 6 samples from suspected lead poisoning cases to help field veterinarians to confirm their diagnosis.

Animals that have had an abnormal lead intake will show elevated blood lead levels for some weeks before they slowly fall to near normal levels. Lead levels in the liver and kidney of survivors can remain elevated for many months. Animal tissues containing elevated lead levels are not acceptable for human consumption (see 'Chemical residues' below).

Treatment

The treatment of stock affected by lead poisoning is often unsuccessful. Animals in the early stages of poisoning are more likely to respond than those that are seriously affected. However, the outlook is poor for any animal that has ingested a large amount of lead from sources such as old batteries, lead paint or other forms of lead that are more readily absorbed from the gut.

All treatments should be carried out in accordance with veterinary advice. Injections of thiamine hydrochloride (vitamin B1) can reduce the effects of lead on the central nervous system. Drenching with small amounts of magnesium sulfate (Epsom salts) may also help to reduce absorption of lead from particles held in the reticulum of cattle, sheep and other ruminants. These relatively low-cost treatments may improve the survival rate of clinically affected animals.



Figure 3. Particles of battery lead in the reticulum of a fatally poisoned weaner.

More intensive treatment options are available, including injections to increase the rate with which lead is eliminated from the body. However, these options are unlikely to be cost-effective for commercial livestock.

Chemical residues

Stock exposed to abnormal lead intake must not be slaughtered for human consumption until animal health authorities are confident that their tissues meet food standards. Unacceptable lead levels can persist for many months in the liver and kidney of stock that have recovered from lead poisoning.

Some exposed animals that did not show signs of poisoning may also have eaten enough lead to cause tissue residues so slaughter restrictions initially apply to the affected mob. These restrictions are usually confirmed in a written agreement between the stockowner and their local Rural Lands Protection Board stock inspector.

Blood tests can be used to separate unaffected animals from those with a recent abnormal lead intake. Testing usually allows the majority of the mob to be released from slaughter restrictions. Blood samples should be collected within three weeks of the last exposure to lead in order to ensure that all affected stock are identified. Samples can be stored by the collecting veterinarian or laboratory for later testing. The stockowner is responsible of the cost of testing.



Figure 4. Remove old batteries to reduce the risk of lead poisoning.

Preventing problems

Prevention is the best cure. Stock are expert at finding old batteries, lead-based paint, sump oil and similar poisoning risks in the farm rubbish tip or around the machinery shed. It is essential that these areas are well fenced and managed to prevent stock access.

Batteries powering electric fences and other farm equipment also need to be secured from stock. Where possible, remove any old batteries from your property by taking them to an approved recycling facility. Make sure that any broken battery cases and spilled contents are also removed.

Check for these hazards before putting stock onto new country and by 'scouting ahead' when droving stock.

Other poisoning risks

While checking for lead poisoning hazards, consider reviewing the security of other farm areas that offer potential stock poisoning risks – including chemical stores, chemical handling areas, spray gear and stores of treated seed grain. Ensuring that stock remain isolated from these hazards will reduce the risk of loss from accidental poisonings as well as keeping them contaminant free.

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