Bracken poisoning in cattle

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The ingestion of bracken fern causes the death of numbers of young cattle in the South-West of Western Australia every year. Early experimental work in the United Kingdom demonstrated that bracken contained an anti-Vitamin B1 factor called thiaminase which was thought to be the cause of the poisoning, but later work indicated that a bone marrow poisoning, not yet chemically identified, was responsible.

The damage to the bone marrow tissues leads to a reduction in the number of white blood cells (necessary for protection against infection) and thrombocytes (necessary for blood clotting). At the same time there is an increase in the fragility of the capillaries or small blood vessels.

SYMPTOMS
Dullness and lack of appetite are followed by discharges from the nose and mouth. Later there is fever with small pin-point haemorrhages under the skin. Ulceration of the bowel with sloughing of the bowel lining and internal bleeding are usually present and blood is seen in the droppings.

Post-mortem examination shows bleeding under the skin and possibly in the heart, lungs and intestines. The bowel may contain clots of blood and may show signs of gastro-enteritis with sloughing of the lining.

Death may occur from simple internal bleeding but, as will be explained later, the animal may suffer from septicaemia due to its inability to deal with secondary infections.

TREATMENT
The effect of simple bracken poisoning in cattle is very similar to that of X-radiation, and previous knowledge of this type of damage in man gave rise to some experimental work on treatment in cattle. Evans and others carried out trials of a substance, DL-batyl alcohol which occurs naturally in very small quantities in bone marrow, spleen, liver, aorta and red blood cells. It is found also in concentrates of the liver oil of the Greenland shark.

Synthetic batyl alcohol given by slow injection into the bloodstream and supported by treatment with antibiotics and sulpha drugs, raised the recovery rate from about one in four to three in four, but the cost of the treatment (about £10 per animal) is likely to limit its use.

Another treatment consists of injections of live bone marrow cells. These act as a graft, migrating to the bone marrow where they multiply and replace the bracken-affected tissues.

HAEMORRHAGIC SEPTICAEMIA
This disease, which is also known as Pasteurellosis, is caused by Pasteurella germs which may be present in the lung tissues of normally healthy animals without causing ill-health. When an animal's resistance is lowered however, the Pasteurella organisms can multiply rapidly, resulting in fever, salivation, increased rate of breathing and pneumonia which is often fatal.

It was suggested that bracken poisoning, by causing bowel damage, could facilitate
the entry of Pasteurella organisms into the tissues. As a means of preventing the infection, calves in the Bridgetown, Manjimup and Pemberton districts were commonly given injections of killed Pasteurella vaccine.

As mentioned earlier in this article, bracken poisoning affects the bone marrow and destroys the white blood cells which protect the body by their constant battle against invading germs. It is now thought that it is the bone marrow damage, rather than the damage to the bowel lining which is responsible for the frequent association between bracken poisoning and haemorrhagic septicaemia.

Animals vaccinated with Pasteurella vaccine will usually exhibit increased resistance to Pasteurella infection, and may escape or recover from the pneumonic condition. They may succumb however, to internal haemorrhages caused by the advanced stage of bracken poisoning.

Antibiotics and sulpha drugs, which may give good results in the treatment of Pasteurellosis are ineffective in the case of simple bracken poisoning.

**VACCINATION PROBLEM**

For some unknown reason, a number of calves vaccinated in the Manjimup area during 1959, were seriously affected by Pasteurella vaccination. Similar trouble has been reported from overseas, prior to the West Australian experience.

Within a few minutes, or occasionally up to two hours, after vaccination with as little as 1 cc. of the vaccine, some of the animals showed considerable distress. Un easiness, followed by slobbering, increased breathing rates, and stamping with signs of abdominal pain were the usual preliminary symptoms. Affected animals may cough up froth from the lungs and eventually go down gasping for breath and showing a blue colouration of the normally pink membranes of the mouth and tongue.

Prompt treatment by injecting 1 to 2 cc. of 1:1,000 Adrenaline intramuscularly is usually effective. Probably 5 cc. injected under the skin would be equally effective.

**Precautions.**

- The recommended dose of vaccine was formerly 5 cc. with 10 cc. given ten days later. *This has now been reduced to 1 cc. followed by 3 cc. a week later.*
- Try a test batch of say five animals, to observe the reactions, before going ahead with the vaccination of larger numbers.
- Preferably treat in small batches so that treatment with Adrenaline can be applied quickly if necessary.
- Try to vaccinate when the weather is cool. Hold the animals in a shady spot before and after vaccination.
- Do not disturb animals unnecessarily for about two hours after vaccination. During this time, a close watch may be necessary although, it is generally experienced that the more severe cases occur early, that is within about half an hour.

**SUMMARY**

Bracken fern poisoning is due to a toxic principle in the fern causing bone marrow damage. Treatment at the present time is uneconomical.

Mild cases of bracken poisoning are probably widespread and the use of Pasteurella vaccine helps to prevent affected animals from contracting Pasteurellosis in their weakened state.

Some animals are allergic to Pasteurella vaccination and precautions and treatment are outlined.