Agnote

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'Swainsona' Poisoning in Cattle and Horses

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INTRODUCTION

Some species of *Swainsona* plants are known to cause poisoning in livestock. Seven species of *Swainsona* cause sporadic poisoning in livestock in inland areas south of the Tropic of Capricorn, in all Australian states. Some of these *Swainsona* species are commonly known as 'Darling Pea' or 'Poison Pea'. In Central Australia, *Swainsona* poisoning is caused by the plant *Swainsona canescens* (see Figure 1). For simplicity, henceforth we will refer to *Swainsona canescens* as 'Swainsona'.

Figure 1. A mature *Swainsona canescens* plant

'Swainsona' is a stout-stemmed, erect plant, 30+ cm tall with numerous hairy leaflets, purple pea-shaped flowers and 10-cm long woolly pods. This plant tends to grow from August to October in heavy sanded areas where seasonal flooding occurs, especially after winter rains. 'Swainsona' may poison both cattle and horses. They are more likely to eat it when its growth is abundant while alternative feed is scarce. Horses especially selectively graze 'Swainsona'.

CLINICAL SIGNS OF 'SWAINSONA' POISONING

'Swainsona' poisoning is caused by swainsonine, an indolizidine alkaloid poison in the plant. Clinical signs of poisoning develop after ingestion of swainsonine, which acts in two ways:

- Blocks the enzyme mannosidase, which causes the build-up of abnormal complex sugars in body cells.
- Interferes in the normal production of enzymes, hormones and immunoglobulins.

The central nervous system is particularly sensitive to the toxic effects resulting from the build-up of abnormal complex sugar. Depending on the animal species and the amount eaten, clinical signs of 'Swainsona' poisoning may become evident within two to six weeks and progress to a chronic or fatal stage after eight weeks. The clinical signs of poisoning may first be noticed as loss of condition followed by nervous signs. This was demonstrated in feeding trials using cattle and horses at the Arid Zone Research Institute, Alice Springs in 1978 (also see Table 1).

After four weeks of ingestion, clinical signs of poisoning may be reversed if access to 'Swainsona' is prevented for a couple of months. This is consistent with a case reported in 1980 by a Government veterinary officer, when

1000 head of cattle were moved after grazing for four weeks in an area of ‘Swainsona’ growth and where no cattle died subsequently.

Although some clinical signs of poisoning may be reversed after six to eight weeks of ingestion of ‘Swainsona’, other neurological and behavioural changes may persist because of permanent cell damage. At this stage, the damage may result in a long-term reduction in fattening and breeding efficiency in cattle and a reduction in riding safety in horses.

DIAGNOSIS OF ‘SWAINSONA’ POISONING

Diagnosis is usually based on a history of grazing on ‘Swainsona’, clinical signs and laboratory testing of blood and post-mortem tissue samples. Tissue samples should include the kidney, liver, pancreas, lymph nodes and most importantly the brain, in formalin.

Table 1. Clinical signs of ‘Swainsona’ poisoning

Period of consumption	Cattle	Horses
Two weeks	Cattle appear able to graze for a couple of weeks before clinical signs appear.	Paddling gait, hypersensitivity to touch, tremor, forced respiration.
Four weeks		Loss of condition.
Six weeks	Paddling gait, hyper-excitability, loss of condition, charge when approached.	Depression, incoordination, head pressing, hind-leg dragging, front leg high-stepping.
Ten weeks	Depression, incoordination, some deaths, animals that survive are poor in condition.	Recumbency and death.
Suspected long-term (Reference 4)	Infertility, abortion.	Emaciation, difficulty in eating, lowered head, ventral swelling, apparent blindness, walking in circles.

‘SWAINSONA’ POISONING VERSUS BIRDSVILLE DISEASE

The signs of ‘Swainsona’ poisoning in horses resemble those of mild Birdsville disease (i.e. ‘Indigofera’ poisoning) (see *Agnote* K9, Birdsville Disease). Horses with suspected ‘Swainsona’ poisoning may have had access to both *Swainsona canescens* and *Indigofera linnaei* plants. To assist with disease diagnosis, Table 2 lists the differences between ‘Swainsona’ poisoning and Birdsville disease.

Table 2. 'Swainsona' poisoning compared to Birdsville disease

Feature	'Swainsona' poisoning	Birdsville disease
Species affected	Horses and cattle.	Horses only.
Plant analysis	*Swainsona canescens* plant identified in the area/or stomach of affected stock.	*Indigofera linnaei* in the area and/or in the stomach of affected horses.
Time of year	Late winter to early summer - especially after flooding.	Summer - especially after early rains.
Post-mortem changes	Microscopic changes seen in post-mortem tissues.	No typical post-mortem tissue or blood changes.

CONTROL

Both cattle and horses become addicted to 'Swainsona'. Even in the presence of alternative feed they will continue to eat the plant. If management takes control measures before stock have eaten 'Swainsona' in large quantities over a long period of time, the clinical signs of early 'Swainsona' poisoning may be reversed.

The following are practical control measures:

- **Monitor heavy-sanded, flood-prone country** as it favours 'Swainsona' growth.
- **Fence off** areas of country that support large expanses of 'Swainsona' growth.
- **Monitor stock** grazing near areas of 'Swainsona' growth.
- **Shift susceptible stock** away from areas of 'Swainsona' growth.
- **Withhold cattle** from sale/slaughter for a month if they have grazed large amounts of 'Swainsona'.
- **Carefully assess horses** before riding if they have grazed large amounts of 'Swainsona'.

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