

## Suspected *Solanum* spp. poisoning in extensive beef cattle

### Overview

In November 2006, 24% of a breeding cattle mob on arid rangeland south of Alice Springs were poisoned over a five day period (disease incident) after eating 'wild tomato' (*Solanum quadriculatum*) and 'native tomato' (*Solanum ellipticum* var. foothills) (Figure 1).

This disease incident was presented in a case report to the 2007 Townsville Conference of the Australian Cattle Veterinarians<sup>i</sup>.

### Cattle in paddock ... before and during incident

Of the 95 breeder cows and heifers in the paddock, 83 were mainly mature Droughtmaster cows, imported from the semi-arid tropics of Katherine in 2004. The remainder were locally-born three year old Droughtmaster cross heifers. In the three weeks leading up to the disease incident, paddock feed had been abundant, dry, but low quality and there had been a couple of small rainfall events totalling less than 10mm. During the five day disease incident, 23 sick or dead cows were recorded. Sick cows appeared aggressive, depressed or moribund. The age mortality percentage ranged from 43% in eight year old introduced cows to no mortality in three year old introduced or local-bred heifers. The comparatively high percentage of deaths in the six to nine years old cows suggests that absence of grazing experience in weaners on arid rangelands had increased their risk of plant poisoning.

### Necropsy and histopathology

Necropsies were undertaken on five cows; remarkable findings included:

- dry rumen contents with a large green feed component (five cows)
- pin-point, bright reddening or bleeding of the rumino-reticular wall (four cows)
- bright or intense, dark reddening of the proximal (fundic) abomasal mucosa (four cows) (Figure 2)
- pulmonary interstitial emphysema with epicardial haemorrhages (four cows)
- constricted (empty) urinary bladders (two cows).

### Histopathology indicated:

- non-specific tissue changes (consistent with anorexia, dehydration, agonal change and 'shock reaction' in the necropsied cows)
- specific tissue changes that supported the necropsy findings (epicardial haemorrhage; pulmonary emphysema; broncho-pneumonia)
- specific tissues changes that augmented necropsy findings (haemorrhage in the abomasal wall (Figure 3); necrosis and inflammation in the rumen wall (Figure 4).

Histopathology of the rumen wall has not been previously reported for *Solanum quadriculatum* or *Solanum ellipticum* poisoning of ruminants.

### Botanical expertise

A botanist at the NT Herbarium identified pieces of ingested plants from dried rumen contents of four necropsied cows, and plant specimens from two paddock surveys. Out of the seven potentially poisonous plants that were identified, six had been grazed; including *Solanum* spp. plants.

### Historical feeding trial

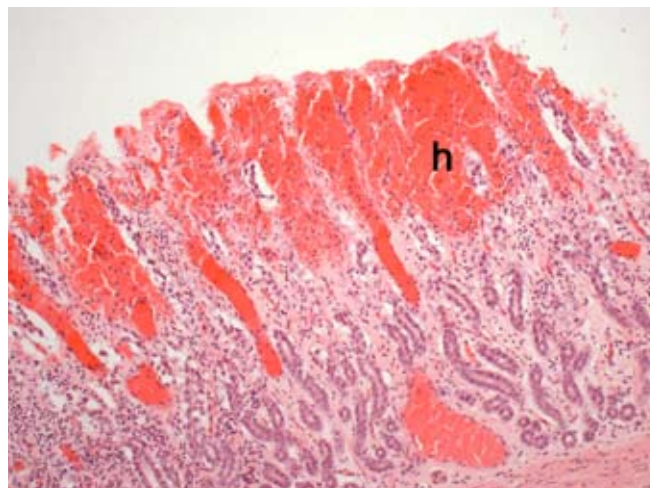
The differential diagnoses focused on the forestomach and abomasal lesions, plus a previous report about cattle deaths in the area. After ruling out infections, parasite infestations, chemical poisonings (urea, arsenic) and other poisonous plants, *Solanum* spp. poisoning was ruled in, based on conditions of plant poisoning in pastoral areas and pathophysiology of a *Solanum* spp. poisoning<sup>ii</sup>. There was also supporting evidence from a historical feeding trial with sheep that were fed *Solanum quadriculatum* in which the reported gross pathology<sup>iii</sup> was notably similar to the disease incident.

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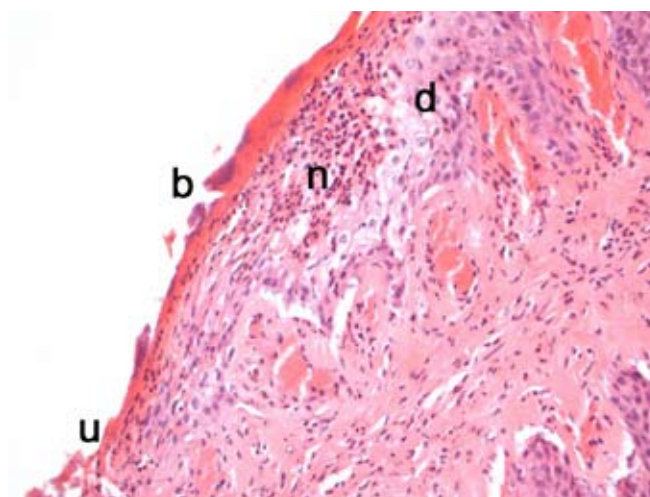
**Figure 1** *Solanum quadriloculatum* (left) and *Solanum ellipticum* var. *foothills* (right)



**Figure 3** Histopathology of abomasal wall (H&E stain)—haemorrhage (h – haemorrhage into the lamina propria of the superficial to mid-level mucosa)



**Figure 2** Gross pathology of abomasum—intense, dark reddening in the fundus



**Figure 4** Histopathology of rumen wall (H&E stain)—necrosis (d – vacuolar degeneration and necrosis of rumen epithelium; n – neutrophil infiltration of areas of necrotic epithelium; b – bacterial colonisation of superficial keratin layers; u – progression from erosion to ulceration)

- i Coventry J and Jerrett I (2007) Suspected *Solanum quadriloculatum* and *Solanum ellipticum* poisoning in extensively-grazed beef cattle in Proceedings of the Australian Cattle Veterinarians 2007, Melbourne & Townsville Conferences, Australian Cattle Veterinarians: pp36-45
- ii Clarke EGC and Clarke ML (1975) Veterinary Toxicology reprinted 1st ed Bailliere Tindall: London
- iii Chippendale GM and Murray LR (1963) Poison Plants of the Northern Territory Commonwealth of Australia, Northern Territory Administration, Animal Industry Branch