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# Chronic ill thrift 429 in elk

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*Some veterinarians in Otago and Southland have observed that chronic ill thrift in elk is relatively common. Characteristically, affected elk or elk-crosses show weight loss or ill thrift over a period of months, often with loose faeces or scouring. Comprehensive treatment can be successful if begun early but it has little effect in established cases.*

We could find only one short article published about chronic ill thrift in elk.<sup>1</sup> To try to throw some light on the condition, we have prepared this review of all cases of unthrifty elk or elk-crosses received by the Invermay Animal Health Laboratory in 1988. The data is supplemented by observations based on our clinical experience of unthrifty elk and elk-crosses.

## Results

In 1988, the laboratory received 40 cases of ill thrift in elk or elk-crosses. There were 70 cases in deer of all breeds.

Elk and elk-crossbred deer are likely to constitute less than 10% of the farmed

deer population, but they represent 57% of the cases of unthrifty deer presented to the laboratory for investigation. Elk and their crosses are more valuable individually than red deer, and this will have favoured their selection for investigation, but nevertheless we feel that elk and elk-crosses are significantly over-represented in ill thrift cases.

In most of these elk and elk-cross cases, the history was of progressive intractable weight loss, and affected deer were known by practitioners as 'wasting' or 'fading' elk. Although scouring is said to be common in unthrifty elk in the field, it was noted in the history in only six of 40 cases. Details of management and treatments given were seldom provided.

Samples from unthrifty elk were submitted at all times of the year, but peaked in August when there were nine cases, more than twice the number in any other month. Cases occurred throughout Otago and Southland.

The laboratory received more than twice as many hind cases (25) as stag cases (12). The age of affected deer ranged from 7 months to 10 years and in 57% of outbreaks, a single animal was affected. Other outbreaks involved from two to 15 deer or from 2% to 100% of the herd.

### Pathology and parasitology

A thickened abomasal wall was the most commonly reported necropsy finding (in five of 15 deer necropsied).

Evidence of abomasal parasitism was the most common histological finding (in five of 14 deer examined). Faecal egg counts were high (> 500 egg) in only two of 33 deer tested. In two of the three cases in which abomasal worm counts were carried out, however, worm counts were high. In one case, there were 40,400 *Ostertagia* and 4,400 *Trichostrongylus* in the abomasum, and in another, 1,600 and 9,000 respectively.

Based on gross and histological examinations, a diagnosis of uterine fibroma was made in one hind and bronchopneumonia in one weaner. Brain histology in four cases showed no significant abnormalities.

### Clinical pathology and trace element assays

Haematology was carried out in only seven cases, and it usually showed an inflammatory leucogram (five cases) and sometimes anaemia (four cases).

Chemistry tests showed consistently low albumin and total protein levels (< 29 and < 55 g/l respectively) indicating possible gastroenteric loss of protein. Pepsinogen levels were high (1.1-9.9 g/l) in 30% of 10 cases, indicating abomasal damage possibly as the result of parasitism.

Serum copper levels were variable but marginal or low (< 8 mmol/kg) in 44% of 18 cases. Liver copper levels were also variable but marginal or low (< 95 mmol/kg) in 70% of 10 cases. In two of the three

cases with a history of fragile bones, liver copper assays were carried out and were low (57 and 72 mmol/kg).

Selenium status was infrequently measured. Blood glutathione peroxidase levels were low (< 2 ku/l) in 20% of 10 cases, but liver levels were adequate in all three cases tested (> 450 nmol/kg).

Vitamin B12 levels were measured in six serum samples and one liver sample and were marginal to low by sheep standards (< 370 pmol/l and < 220 nmol/kg respectively).

### Bacteriology and serology

In one unthrifty scouring weaner deer, enteric yersiniosis was diagnosed by the isolation of *Y. pseudotuberculosis* from intestinal samples. Otherwise bacteriology tests were negative.

Serological tests for Johne's disease and leptospirosis (in five and two cases respectively) were negative.

### Specific diagnoses

There were 10 cases in which at least one of the signs of abomasal parasitism (nodular abomasal mucosa, histological evidence of abomasal parasitism, high abomasal worm counts or elevated pepsinogen levels) occurred.

Other specific diagnoses were made in one case each. These were uterine fibroma, enteric yersiniosis and bronchopneumonia.

### Discussion

A review of 40 cases of weight loss in elk and elk-cross deer in 1988 suggested that there are tendencies for the condition to occur in winter more often than in other seasons; in hinds more often than in stags and in purebred elk more often than in crossbred-elk. These cases were referred to Invermay Animal Health Laboratory by veterinary practitioners, but they may not be representative of the disease pattern in the field.

The role of parasitism was impossible to assess in many cases because either insufficient history was given or insufficient or inappropriate samples were provided or both. Laboratory findings suggested that abomasal ostertagiasis contributed to the ill thrift in a proportion of cases, but the species of nematode involved was not identified. In our experience, elk and elk-crosses appear to require more anthelmintic treatments than red deer, especially as adults. They may be more prone to gastrointestinal parasitism.

Levels of copper and selenium were low in some cases. Hypocuposis and hyposelelenosis are causes of ill thrift in cattle. However, there are no copper and selenium response trial data to determine meaningful reference values for deer. Hypocuposis is a cause of bone fragility in cattle and sheep and it has been associated with bone fragility in deer. In the two cases described here in which fragile bones were noted, the low

liver copper levels may have been significant.

Low serum B12 levels (by sheep standards) have been reported in deer which showed no weight gain response to vitamin B12 supplementation.<sup>2</sup> Therefore, sheep reference ranges should not be used in deer. The study showed one liver vitamin B12 level in the marginal range for sheep and cattle, but the significance of this is not known.

On histological examination of the brain of four deer, there was no evidence of the spongiform encephalopathy which has been linked to a 'wasting elk' condition in North America. Clinical signs of this condition are weight loss, behaviour changes and sometimes excess salivation and tooth grinding.<sup>3</sup>

We have observed that most unthrifty elk or elk-crosses are mature hinds although bulls post-rut may also be affected. The problem tends to occur on high quality ryegrass clover pastures in spring and autumn. Supplementation with high quality lucerne hay appears to prevent diarrhoea and ill thrift from developing.

### Early cases respond well

The response to treatment of elk and elk-cross deer which are unthrifty and/or scouring depends on the stage to which the condition has progressed. Early cases often respond well. More advanced cases may have to be treated several times and severe cases often die in spite of treatment.

In our experience, treatment which has been successful in some cases consists of various combinations of the following: copper supplementation in oral or injectable form, 3-weekly administration of ivermectin at double or triple the cattle dose rate (therefore selensised drench should not be used), injection of longacting oxytetracycline and vitamins, and supportive therapy for scouring animals.

Management changes are just as important as medication. The animals should be removed from pasture and provided with lucerne hay and other forms of roughage until they return to normal.

### References

- 1 Bringans, M 1987: Wapiti Health. *Deer Farmer*, November 1987: 44.
- 2 Clark, R G, Burbage, J, Marshall, P, McD, Waller, T, Wallace, D 1986: Absence of a vitamin B12 weight gain response in two trials with growing red deer (*Cervus elaphus*). *New Zealand Veterinary Journal* 34: 199-201.
- 3 Williams, E S, Young, S 1982: Spongiform encephalopathy of Rocky Mountain Elk. *Journal of Wildlife Diseases* 18: 465-471.

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