

## **POST VELVETTING DEATHS IN STAGS**

**I H Walker, A Middelberg**



### **1. INTRODUCTION**

Velvet removal from stags two years and over is a common and routine procedure carried out by many veterinarians who service deer farming clients. It is an important source of income to the farmer and an essential procedure in good deer farm management. Losses from such a routine are not generally anticipated but this paper outlines some post-velvetting deaths which occurred during the past season in Central Hawkes Bay, and steps undertaken to investigate this issue both locally and elsewhere.

### **2. VELVETTING PROCEDURE**

The most common procedure employed by our practice is to sedate the stags to be velvettted, apply local anaesthetic to the antlers by either a nerve block or infiltration around the base of the coronet, apply a tourniquet and then remove the velvet just above the coronet.

#### **2.1 Sedation**

This is achieved usually by intramuscular injection into the gluteal region with a hand-held or pole syringe using a 2%, 5% or 10% xylazine solution at a rate of 0.25 - 0.6 mg/kg liveweight.

Intravenous top-ups are sometimes given using a 2% xylazine solution.

The dose rate given is estimated so that the stags are either standing or will just go into sternal recumbency.

#### **2.2 Local anaesthetic**

- a. Injection of 2% lignocaine at the emergency of the zygomatico-temporal nerve and the infratrochlear nerve on each side of the skull, or
- b. subcutaneous infiltration of local anaesthetic at the base of the pedicle.

**2.3** Tourniquet application to control haemorrhage involves stretching a piece of flexible rubber one and a half to two times around each pedicle and tucking in the free end to secure it.

**2.4** Velvet removal is done with a meat saw once the animal is not feeling any pain.

- 2.5 Tourniquets are removed after a few minutes and the stags are walked from the shed back to the recovery paddock. Any stags that do not stand up readily are given 2-3 mls yohimbine hydrochloride ("Recervyl") intravenously to reverse the effects of xylazine.
- 2.6 The veterinarian generally leaves the property at this stage having given the farmer suitable instructions for the care of the stags until they have fully recovered (see Appendix).

Stags intended for velvetting are generally run into the yards or shed from the paddock only a short time before the pending arrival of the veterinarian. Attempts at pre-anaesthetic starvation have in the past been found to be impractical, often resulting in velvet damage and undue stress to the stag.

### 3. POST VELVETTING DEATHS

- 3.1 A number of deaths of stags velvetted by this practice have occurred in the past season during a period twelve to twenty-four hours after the velvetting procedure. Stags have been observed in the evenings apparently fully recovered, yet found dead the next morning.

The following summary is from five stags referred for investigation by clients in sufficient time to enable thorough examination.

#### 3.2 Gross post mortem findings:

- a) The stags have been found in either sternal or lateral recumbency with no obvious signs of haemorrhage from the stag nor is there any evidence of struggling in the paddock.
- b) The only gross post mortem features are:
- (i) areas of endocardial haemorrhage;
  - (ii) large amounts of froth in the trachea, bronchi and bronchioles;
  - (iii) colour of carcass good.

#### 3.3 Histopathology:

- a) No significant findings in brain, liver, kidney or intestine;
- b) Heart - mild agonal interstitial haemorrhage

- c) Lungs - generalised oedema;
  - wider than normal interlobular septa, with severe infiltration of degranulated eosinophils;
  - eosinophils are also present perivascularly, in bronchiolar walls and in some alveoli.

The pathological findings of pulmonary oedema and degranulating eosinophils is considered by pathologists to be consistent with a diagnosis of hypersensitivity, the cause of which is speculative.

However, these findings also posed a number of questions.

- (i) What is the significance of the histology?
- (ii) Is the apparent hypersensitivity of any significance?
- (iii) Are lungworm burdens of any consequence?
- (iv) Were the deaths recorded a 'one-off' situation or were other properties experiencing the same problem?
- (v) Was there a procedural or management strategy which had to be addressed?
- (vi) What should or can we do about the problem?

#### **4. FURTHER INVESTIGATIONS**

##### **4.1 Histology**

To try and establish the significance of the lung histology, lung samples were collected from 18 two-year-old stags at the local deer slaughter premises according to the following regime.

- (a) Stags which had been develvetted less than twenty-four hours prior to slaughter.
- (b) Stags which had been develvetted ten days prior to slaughter.
- (c) Stags which had velvet which was not removed prior to slaughter.

A histological examination of the eighteen lung sections was performed to establish:

- a) Histological parameters of "normal" lung
- b) Any histological differences that there may be between healthy deer before and post velvetting

The following parameters were measured:

- (a) Peribronchiolar eosinophils
- (b) Peribronchiolar mononuclear wbc.
- (c) Interstitial eosinophils

- (d) Interstitial mononuclear wbc.
- (e) Alveolar eosinophils
- (f) Alveolar macrophages
- (g) Alveolar RBC's
- (h) Interstitial oedema
- (i) Interstitial neutrophils
- (j) Alveolar oedema
- (k) Alveolar neutrophils
- (l) Alveolar/Interstitial granulomata
- (m) Alveolar/Interstitial parasites

A semi-quantitative scoring technique was devised, with the data obtained being suitable for a chi-square analysis.

The lung from only one animal slaughtered ten days post velvetting showed an eosinophilia of the same severity as the animals which died in the field after velvet removal. However, the general level of eosinophilia in the lungs from those animals which had been velvetted prior to slaughter was not significantly greater than those which were not.

The study showed no obvious difference between healthy deer pre- and post-velvetting, but it did show that oedema and large numbers of eosinophils are an unusual finding.

#### **4.2 Parasitology**

The faecal lungworm larvae count of a mob of spikers in which there was a death, was monitored. The faecal larval count ranged from 2-49 larvae per gram, with a mean of 9.7 larvae per gram.

With lungworm burdens, histologically one tends to find eosinophils with only a few showing any degranulation. The degranulating eosinophils were more pronounced in the lungs of the dead stags than could be attributed to lungworm burdens.

#### **4.3 Survey of veterinary practices**

A survey of eleven practices was undertaken to see if other practices were experiencing the problem of post-velvetting stag deaths and secondly to establish any detail available on deaths recorded, and whether any pattern of occurrence was evident.

**TABLE 1.**

<b>SURVEY DATA</b>	
Practices surveyed	: 11
Estimate of total number of spikers which had spikes removed on client properties	: 9795
Estimate of spiker deaths	: Number unknown but deaths have occurred
Estimate of total number of stags velvetted on client properties	: 17256
Total number of deaths recorded of adult stags	: 30

i.e. average 1.74 per 1000 adult stags velvetted

**TABLE 2.**

<b>METHOD USED FOR VELVETTING</b>	
<b>(% of total no. adult stags velvetted)</b>	
Crush and local analgesia	2.9%
Crush and sedative	0.0%
Crush and local and sedative	2.2%
Sedatives only	1.5%
Sedative and analgesia	93.4%

**TABLE 3.**

<b>SEDATIVES USED FOR VELVETTING</b>	
"Rompun" only	33.2%
"Thiazine" only	64.3%
"Fentaz" only	0.0%
"Fentaz" and "Rompun"	1.16%
"Fentaz" and "Thiazine"	1.35%

Detail available on deaths of stags from the survey was fairly scant. Very few had been autopsied and presumptive diagnosis of death was made by the practitioner concerned. Diagnoses included:

- septicaemia/toxaemia
- physical injury
- suffocation
- bloat and/or regurgitation of rumenal contents with inhalation pneumonia
- stress/shock
- haemorrhage

Time of death ranged from one to three hours to several days.

Age of stag varied from two to more than twelve years old.

All stags which had died post-velvetting had received xylazine and local anaesthetic, and some had "Recervyl" as well.

Three practices reported deaths in yearling stags following spike removal, a procedure normally carried out by the farmer and of which there is no detail available.

It is also apparent from two practices that the incidence of deaths has increased markedly in this last season. In both cases this increase was several fold and over a large number of stags.

It is likely from the variation in loss rate between practices, that some farmers do not report deaths to the veterinarian. Further, this survey does not include losses experienced by farmers who perform their own velvetting.

**4.4** As a consequence of the post-velvetting deaths, we completely reviewed and discussed velvetting procedures and also the various farm management strategies employed on the properties involved.

Factors involved included:

- (i) Pre-velvetting treatment - this encompassed pasture conditions, levels and types of supplementary feeding, farm fertilizer history, climatic conditions at the time.
- (ii) Velvetting treatment, including drugs used and dose rates, procedures during velvetting, and discussion based around the differential diagnosis of deaths in these circumstances.
- (iii) Post-velvetting care including the degree of sedation of stags as they return to the paddock, the possibility of future haemorrhage after tourniquet removal, the degree of supervision required of these stags. There are occasions when stags appear more depressed than normal the day after velvetting but subsequently recover. Are these stags afflicted with the same problem, but do not quite die?

We also investigated the possibility of some common genetic background in the stags of which we had breeding histories.

5.           **CONCLUSIONS**

It is our feeling that we are dealing with some form of delayed hypersensitivity as a consequence of xylazine administration, probably to a product of xylazine metabolism. We assume that there are very small amounts of xylazine left in tissues of deer after more than five hours, as is the case with sheep and cattle. Deaths during the period of twelve to twenty-four hours post-velvetting do not support an anaphylactic type reaction to xylazine per se, but perhaps to a metabolic product or a carrier agent or metabolic product of such a carrier agent.

The other very important factor is that deaths have only occurred in animals which have had xylazine. Some stags have had either local anaesthetic or "Recervyl" as well, but we have had a death in a yearling stag that only had xylazine and nothing else, and which demonstrated the histological findings which I have described.

It is also patently obvious that more information is needed to either validate or negate these findings.

**Acknowledgments:**

Dr R Thornton of Animal Health Laboratory, Palmerston North.

**Appendix:**

**Copy of a letter given to all deer clients**

Veterinary Services (H.B.) Ltd  
PO Box 503, Waipukurau  
Ph. 89 060

**INSTRUCTIONS TO FARMERS FOLLOWING VELVETTING OF STAGS**

Following the de-velvetting of stags, the farmer should check that:

1. All tourniquets have been removed from the pedicles before the stag leaves the shed.
2. Stags are returned to a recovery paddock as soon as possible. This should be clean pasture with no creeks, drains or dams to which the animals have access until fully recovered from the anaesthetic.
3. If the stags sit down they are in a normal sitting position and not lying on their sides.
4. Stags should be made to stand up at regular intervals and to move around.

It is the farmer's responsibility to keep the stags under continuous surveillance until they have fully recovered from the anaesthetic. Factors which indicate the animal is still under the effects of the anaesthetic drug include:

1. Unsteadiness on their feet and uncoordinated gait.
2. Lolling of the tongue out the side of the mouth.
3. Excessive saliva coming from the mouth.
4. Excessive periods of lying down.
5. Stag appears bloated.

The stag will have recovered from the anaesthetic when he is grazing normally, has a coordinated gait, and whether sitting or standing the head is above the shoulder of the stag.

If the farmer is in any doubt about a stag during the recovery period, he should contact the attending veterinarian immediately.

**Signed:** .....  
Veterinarian