

A LIVER BIOPSY TECHNIQUE FOR USE IN RED DEER

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Introduction

Liver biopsy is a technique which has been used in domestic species of livestock since Dick (1944) first described the procedure for obtaining liver samples from live sheep. Despite the ease with which the technique can be performed in most species, it is not used routinely by the majority of veterinary practitioners. The reasons for this are not immediately apparent but could relate to the seemingly small sample of liver which is obtained. It is important for the profession to realise that both trace element analyses and histology can be carried out on a sample weighing only 20 - 100mg, providing care is taken with the material after collection. Copper estimations can be performed on samples weighing less than 100mg, with most of the atomic absorption spectroscopic units available in N.Z. By using the biopsy technique sufficient numbers of specimens can be collected to give an accurate assessment of the trace element status of a flock or herd, together with other appropriate samples and the clinical history.

Various modifications to the original technique have been reported, including insufflation of the peritoneal cavity with oxygen (Donald et al., 1984). However, to be of any value to the practising veterinarian the technique has to be simple, safe and repeatable.

This paper describes a technique used successfully on 10 red deer (Cervus elaphus), three times at monthly intervals.

Materials and methods

Ten red deer stags, 9 months of age and with a mean body weight of 95.7 kg, were held in pens and fed ensilaged pasture for a period of 2 months whilst undergoing a programme of copper depletion and repletion. As a consequence it was necessary to measure their liver copper levels at intervals during this trial. Initially a laparotomy had to be carried out to determine the position of the liver in a recumbent deer and the best site for entry of a biopsy needle through the skin.

Biopsy procedure

Animals were immobilised using 1.5 - 2.5ml of 2% xylazine hydrochloride (Rompun, Bayer) injected intramuscularly and then were positioned in lateral recumbency on their left side, with an assistant holding the head if necessary. The point of entry had been decided upon to allow access to the ventral lobe of the liver when the animal was in this position. This was located by positioning fingers in the last three intercostal spaces, slightly above the mid-way point between sternum and vertebral column (Fig 1.). A small stab incision was made at this point, through the skin over the third last intercostal space. The biopsy needle (Fig 2.) was introduced via the incision and advanced through the muscle and

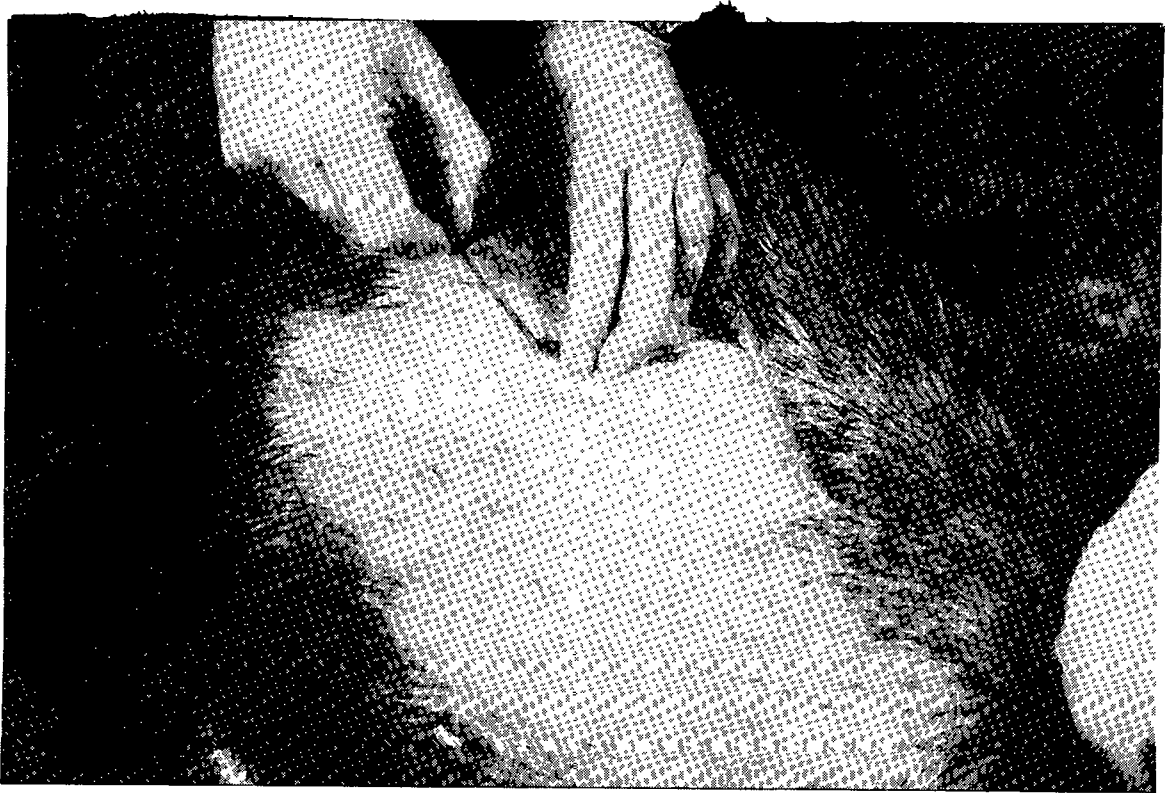


Fig 3. Direction of entry of the biopsy needle.

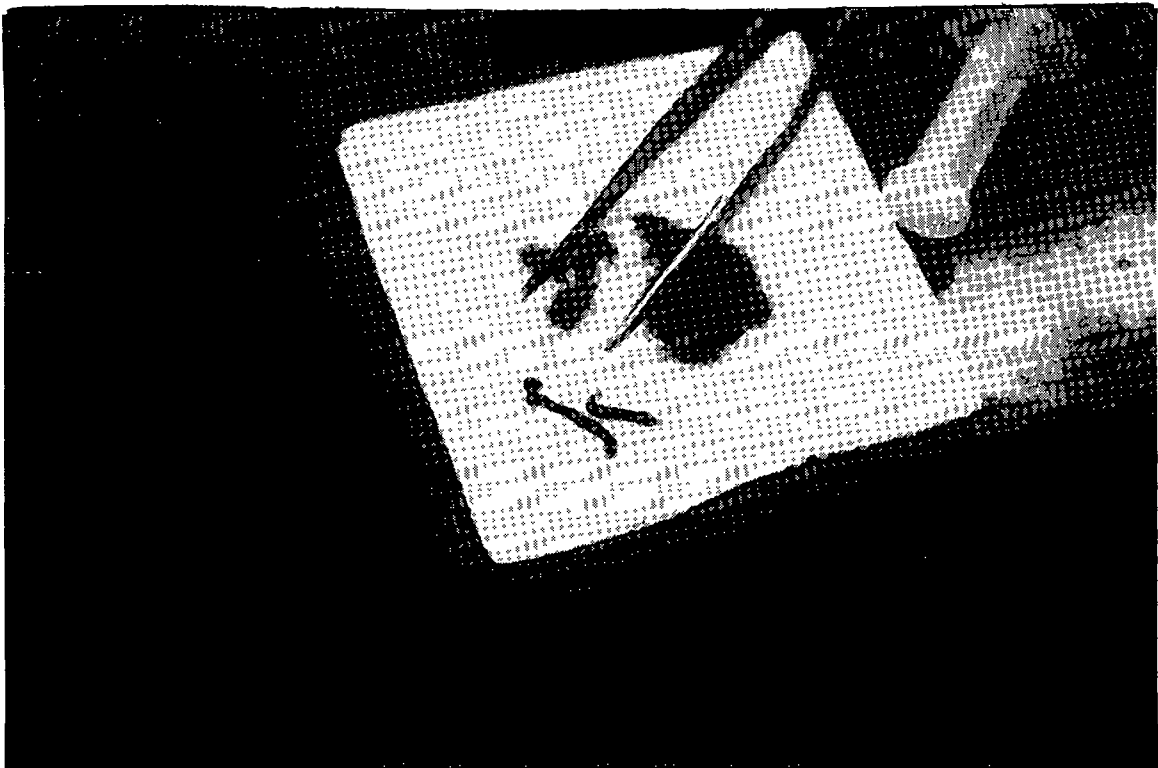


Fig 4. Biopsy sample size.

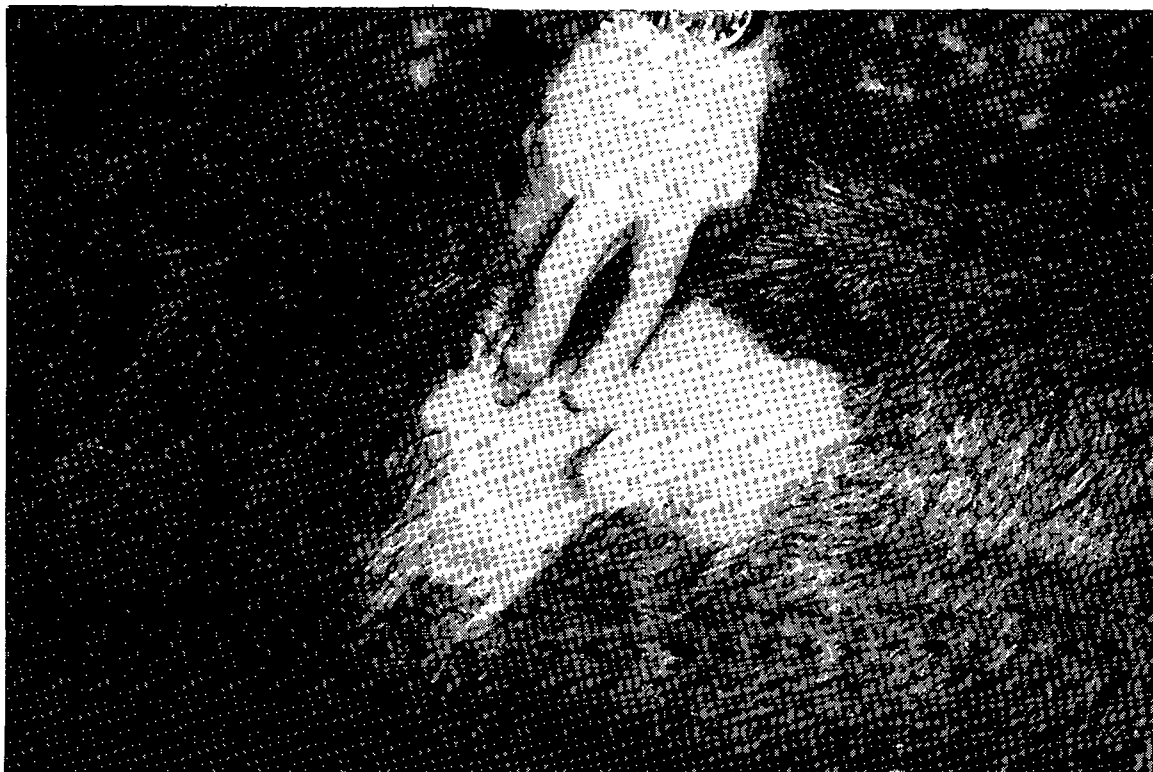


Fig 1. Point of entry for the biopsy needle.
(anterior on the right of Fig.)

BIOPSY NEEDLE

Cannula - extern. diam - 4.05mm
- intern. diam - 3.20mm

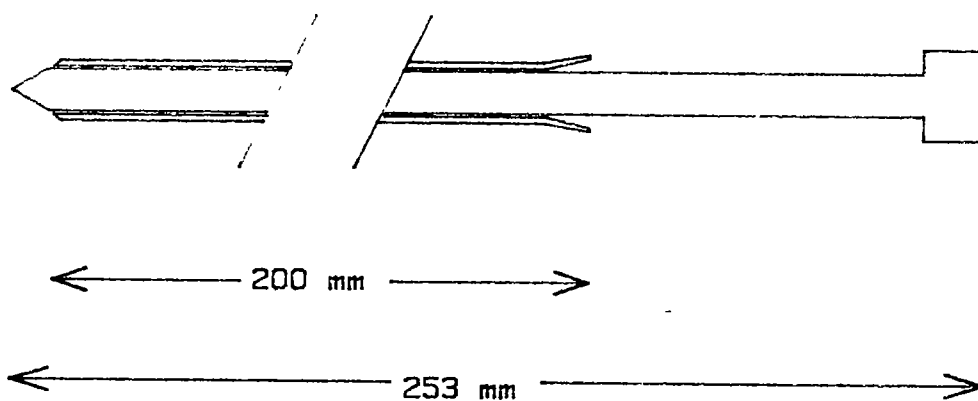


Fig 2. Dimensions of the biopsy needle.

underlying tissues. At this point the internal stylet was withdrawn and the cannula advanced at an angle of approximately 45 degrees (Fig 3.), towards the vertebral column. Contact with the liver surface could be verified by the relatively high rigidity of this organ. Penetration into the liver was achieved by using a rotating movement of the cannula. The liver of the deer felt almost granular on penetration, and this created an effect which was sometimes audible. A luer syringe was then attached to the external end of the cannula and held in position whilst the instrument was withdrawn. Application of negative pressure was found to be inadvisable due to the entry of mesentery into the tube and its subsequent appearance at the site of the incision. The sample of liver was then removed from the cannula and placed on absorbent material to drain off excess fluid (Fig 4.) before being transferred to a labelled container. Acid washed vacutainer tubes proved to be ideal storage containers for these samples. After the biopsy sample had been obtained the animals were given an antibiotic cover and allowed to recover from the xylazine in their pens.

Results

The mean fresh weight of 10 liver samples obtained from stags by using this technique was 250 mg. (SD = 88.3 mg). Standing position was regained within 2 hours. Furthermore no post-operative complications were noted, there were no fatalities, and apart from a depression in feed intake for a period of 12 hours after surgery, appetite remained normal.

Discussion

The technique described here for obtaining liver samples from live red deer is safe, repeatable and inexpensive. In addition the tissue samples which can be obtained are suitable for trace element analyses or histological processing.

References

- Dick, A.T. (1944). Aspiration biopsy of the liver in sheep. *Aust. Vet. J.* 20: 1298 - 303.
- Donald, G.E., Paul, D.R., Langlands, J.P. (1984). Liver biopsy as a technique for assessing copper status in sheep. *Aust. Vet. J.* 61: 121 - 122.