

A simple method for collecting urine samples from male cattle

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Abstract. A harness arrangement made from heavy duty plastic, velcro strips and absorbent cloth allowed the collection of spot samples of urine from 36 steers confined in individual feeding pens. Clean samples of up to 50 mL were collected from all steers on each sampling day without operators being present at all times.

Introduction

The collection of urine samples from cattle is required in many nutritional studies to determine metabolism and excretion of nutrients. In studies where animals are continually housed in pens, partial and total collection of urine is possible using a number of surgical and non-surgical techniques. Total urine collection from large numbers of steers grazing pastures is very difficult without the use of expensive, sophisticated equipment (Siebert *et al.* 1978; Betteridge and Andrewes 1986). The numbers of animals that can be sampled is small and close supervision is required to ensure the equipment is not dislodged and is functioning correctly.

Spot sampling of urine can be carried out on grazing cattle but usually requires that the cattle be mustered and confined during sampling. Samples are then usually collected from steers restrained in a pen or race by operators holding or positioning containers under the pizzle of the steer until they urinate. This method can only be carried out on a small number of animals at a time, as the chance of missing samples increases with an increased number of animals.

This paper describes a harness used to collect subsamples of urine from up to 36 steers at a time, in a combined pen and grazing study.

Materials and methods

The steers from which urine samples were required were part of a Meat and Livestock Association, Queensland Department of Primary Industries and University of Queensland jointly funded project: 'Developing profitable strategies for increasing growth rates of cattle grazing tropical pastures, DAQ 100.' The components of this project conducted on Brigalow Research Station received approval from the Tropical Beef Centre Animal Ethics Committee (approval number TBC 35).

Briefly, this project involved feeding different, known amounts of either a protein meal or grain ration to individual steers on a daily basis within groups of 36 weaner beef steers grazing tropical pastures. Urine samples were required twice weekly, 2 or 3 times throughout each 6-month feeding period. These samples were subsequently used for the analysis of allantoin:creatinine ratios, which indicate the level of rumen microbial activity.

Each group of cattle used during the 4, 6-month feeding periods of the experiment contained 36 steers. Different groups of steers were used for each of the feeding periods. During each feeding period, the liveweights of the steers in each feeding period varied between 150 kg at the start of feeding to about 420 kg at the end. All steers grazed pastures containing buffel (*Cenchrus ciliaris*), Rhodes grass (*Chloris gayana*) and seca stylo (*Stylosanthes scabra* cv. Seca). Steers were mustered and yarded each morning before being drafted into individual pens and fed a supplement. On days when urine samples were required, steers were individually confined in a small raceway where the sampling harnesses were put on the animals before they were placed in feed pens. The harnesses were checked periodically over the next 3–5 h and removed once samples were obtained. All harnesses were removed before animals were returned to the paddock. All animals were re-mustered in the afternoon to be placed back into their feeding pens, and any from which urine samples were not collected in the morning had harnesses placed on them.

The design and materials used in the production of the harness are shown in Figure 1. All straps were double stitched to the heavy-duty polythene plastic, with the velcro tape double stitched to the straps.

Results and discussion

Using this sampling harness, clean urine samples were collected from 36 steers within a 12-h period. Application of the harness took about 1 min per animal, increasing the time steers were confined before being placed in their feeding pens by 15–20 min. The time required to obtain a sample varied from immediately after the harness fitting to 7 h later, with some animals requiring a second application of the harness during the afternoon feeding period before a sample was collected.

Correct application of the harness was essential for the collection of an uncontaminated urine sample, and for normal behaviour of the animal. Incorrect positioning of the harness, where the absorbent material was not directly under the pizzle of the steer resulted in urine either running off the harness or only a small amount being collected. Contamination of the sample with material from the pen floor also occasionally occurred, especially on animals with liveweights over 400 kg, when the harness was not placed centrally under the animal. This contamination was reduced through the use of a light, porous material covering the heavy absorbent cloth.

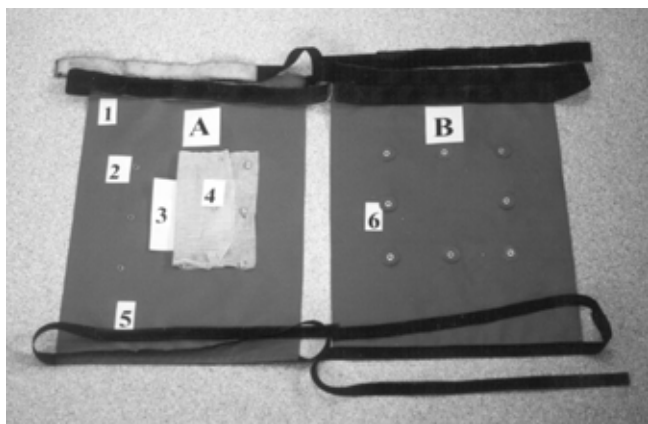


Figure 1. Urine collection harness showing A top side of harness: 1, thick male and female velcro strips on the flank strap; 2, 12 mm press studs; 3, absorbent washable heavy cloth; 4, absorbent, washable, light cloth; 5, narrow male and female chest strap; and B underside of harness: 6, reinforced backing of press studs.

The tension of the flank strap was very important in its affect on animal behaviour. Where the strap was too loose, the animal was able to kick the strap apart causing the harness to hang off the steer. If the straps were drawn too tight, the animal responded by bucking or lying down.

The use of washable heavy-duty plastic and absorbent cloths allowed multiple uses of the harnesses during one collection period. The velcro straps allowed the harnesses to be removed very quickly once samples were collected or if animals were behaving poorly.

Recommendations

The use of this harness is restricted to collecting spot samples of urine from animals with limited movement. The size of the absorbent cloth does not allow the collection of total urine output. However, where small samples of urine need to be collected from a number of animals in a short period of time, this harness has proven successful in the collection of clean samples easily and cheaply.

Acknowledgments

The development of this harness occurred as a requirement within a Queensland Department of Primary Industries, Meat and Livestock Association and University of Queensland joint project. These organisations are thanked for their financial assistance.

References

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Received 13 November 2002, accepted 12 June 2003