Techniques to improve when castrating, tail docking and mulesing lambs

By Vanessa Lai

Introduction

Lamb marking practices have long been a controversial issue of animal welfare. Procedures performed at lamb marking are mostly preventative measures against fly strike. Lambs with shorter tails and less wool around the perineum, tail and breech accrue fewer dags, which attract flies. More specifically, studies have been conducted on levels of pain and distress caused by castration, tail docking and mulesing. Results of these studies have led to further investigation into lowering the levels of distress caused by these practices. Behavioural responses, cortisol levels and results of an electroencephalogram (EEG) measured unpleasant experiences, often suggestive of pain. Alternate ideas such as breeding short tailed sheep, devoid of wool on the head, legs, belly breech and tail have also been explored.

Study 1 (Heath et al, 1999)

The aim of study 1 was to consider the effects of tail docking 1 day old lambs, with respect to behavioural indications of pain immediately after the procedure, and long-term performance to slaughter. Ten sets of twin lambs were used for the study. One lamb of each set was docked and the other was handled for the same amount of time. They were then returned to their mothers and their behaviour observed every five minutes for the next 180 minutes. Lambs that were tail-docked were more vocal than the lambs that were handled. The study concluded tail docking altered the behaviour of the lambs significantly, and the pain and distress associated with it was most acute during the 30 minutes immediately following the procedure.

Study 2 (Bruce et al, 1999)

Study 2 tested the effect of injections of lignocaine (local anaesthetic) into the scrotal neck or testes, on plasma cortisol levels. Prior studies have shown that the rubber ring method of castration and docking of lambs causes plasma cortisol levels to rise, which is an indication that the animal is experiencing pain. Fiftyone lambs were given one of six treatments:

1. Control handling (control)
2. Local anaesthetic injection into scrotal neck (control)
3. Local anaesthetic injected into testes (control)
4. Ring castration and docking
5. Local anaesthetic injection into the scrotal neck five to ten seconds before ring castration and docking
6. Local anaesthetic injection into the testes 5 to 10 s after ring castration and docking

Blood samples were taken before and several times at regular intervals after the procedure and plasma cortisol concentrations determined. Results were disappointing, showing that injections of lignocaine 5 to 10 s before or after castration and docking did not effectively abolish the cortisol response, as did injections to these areas 15 to 20 min before the procedure.' Treatment 5 was more effective than treatment 6, with a cortisol response 43% lower than in ring castration and docking alone. This study suggested that, in situations where elimination of distress was not practicable, an injection of lignocaine 15 s before ring application would significantly reduce distress caused by castration and docking.

Study 3 (Barnett et al, 2000)

Study 3 explored the possibility that pain could be measured using changes in EEG of lambs. Ninety-eight 3- to 4-week-old lambs were given one of seven treatments:-

1. Castration
2. Tail Docking
3. Mulesing
4. Tagging
5. Sham shearing
6. Formalin injection to induce lameness
7. Handling

EEG was recorded for 15 minutes before, during and after the treatment. Results suggested that mulesing produces a pain response similar to that induced by chronic lameness, during and after the treatment. Castration and docking produce a pain response similar to mulesing, at the time of treatment, though not following the treatment.

Practical implications

These studies emphasise the need to develop better techniques of castration and docking, focussing on the welfare of lambs. For the moment, farms should use the most practical method that produces the least indication of pain. For example, surgical castration (spermatic cords torn) causes a significantly larger cortisol response than ring castration (Mellor and Stafford, 2000). Injection of a local anaesthetic into the scrotal neck 15 to 20 minutes before the ring is applied eliminates the cortisol response. Since it is not practical to handle lambs such a long time before the treatment, it is suggested that an injection 10 to 15 s before treatment will reduce the amount of pain sufficiently. Time and cost may discourage farmers from exploring this option. Countries where use of local anesthetics by farmers is illegal will have to resort to the least painful method not involving local anesthetics.

A breeding goal has been developed to improve the welfare of sheep. Traits described in the introduction (Figure 1)* should eliminate the need for tail docking and mulesing (Bray et al, 1999), and reduce the occurrences of fly strike. This animal would be genetically docked, crutched and mulesed, so that it could cope without the aid of physical and chemical treatments. Indeed the welfare of the animal would be improved because generalised animal handling would be considerably reduced.

Further studies

Pain levels in animals have always been, and always will be, difficult to assess in animals. Behavioural responses, plasma cortisol concentrations and EEG are some of the measurements that have been studied. Results of one study have not always confirmed the results of another. If possible, a study should be designed to measure pain levels by testing a combination of stress levels, instead of only one. Eventually it would be ideal to discover a less controversial way to evaluate pain perception.

Further studies should be conducted to see if the "model" breed of sheep (Figure 1) is feasible. Ideally it would be desirable to cross breed by trial and error until this breed has been developed, but this is most likely physically impractical. Perhaps with further advances in genetic technology, it will be possible to genetically design and produce the "perfect" sheep that will satisfy the economic and practical obligations of the farmer, as well as meeting the standards of animal welfare. In the meantime, farmers concerned with animal welfare should draw on studies already conducted to improve their methods of husbandry.

References

Barnett JL, Hemsworth PH, Jongman EC and Morris JP. EEG changes in 4-week-old lambs in response to castration, tail docking and mulesing. *Australian Veterinary Journal* 2000;78:339-343

Bray AR, O'Connell D and Scobie DR. A breeding goal to improve the welfare of sheep. *Animal Welfare.* 1999;8:397-406

Bruce RA, Dinniss AS, Mellor DJ, Stafford KJ, Ward RN. Acute cortisol responses of lambs to castration using a rubber ring and/or castrating clamp with or without local anaesthetic. *NZ Veterinary Journal.* 1997;45:114-121

Bruce RA, Gregory NG, Mellor DJ, Stafford KJ, Sutherland MA, Todd SE and Ward RN. Acute cortisol responses of lambs to ring castration and docking after the injection of lignocaine into the scrotal neck or testes at the time of ring application. *Australian Veterinary Journal*. 1999;77:738-741

Heath HL, Hill J and Notman AB. Welfare of the neonate lamb immediately after tail-docking. Proceeding of the British Society of Animal Science 1999 p108

Hodgson JC, Fleetwood-Walker SM, Mellor DJ, Molony V and Wood GN. Effects of local anaesthesia and intravenous naloxone on the changes in behaviour and plasma concentrations of cortisol produced by castration and tail docking in young lambs. *Research in Veterinary Science*. 1991;15:193-199

Holmes RJ, Lester SJ, Mellor DJ and Ward RN. Cortisol responses of young lambs to castration and docking using different methods. *NZ Veterinary Journal.* 1991;39:134-138

Kent JE, Molony V and Robertson IS. Changes in plasma concentrations of cortisol in lambs of three ages in the first three hours after three methods of castration and docking. *Research in Veterinary Science.* 1993;55:246-251

Mellor DJ and Murray L. Effects of tail docking and castration on behaviour and plasma cortisol concentrations in young animals. *Research in Veterinary Science*. 1989;46:387-391

Mellor DJ and Stafford KJ. Acute castration and/or tailing distress and its alleviation in lambs. *NZ Veterinary Journal*. 2000;48:33-43