Updated clamping

A practical alternative to rubber rings for the castration of lambs

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CONFIDENTIAL

V. Molony, B. Eadie, B. Falconer

Project managed and sponsored by

EADIE·BROS·&CO·LTD·

Selkirk, Scotland brian@eadiebros.co.uk

Updated Castration and Tailing Clamp

1. Clamping is a *skilled operation.*
2. All *Clamping methods are slow* because they involve a short, high intensity crushing of the chords leading to **each** testicle in turn.
3. Although it is usually a permitted method internationally, *its use is minimal on sheep because of these skill and speed factors.*

Professor V Molony *is internationally renowned through the papers he has published over 50 years, on animal pain, and for the various studies he has conducted on castration and tailing methods. Most national and international husbandry standards reference Molony's work.*

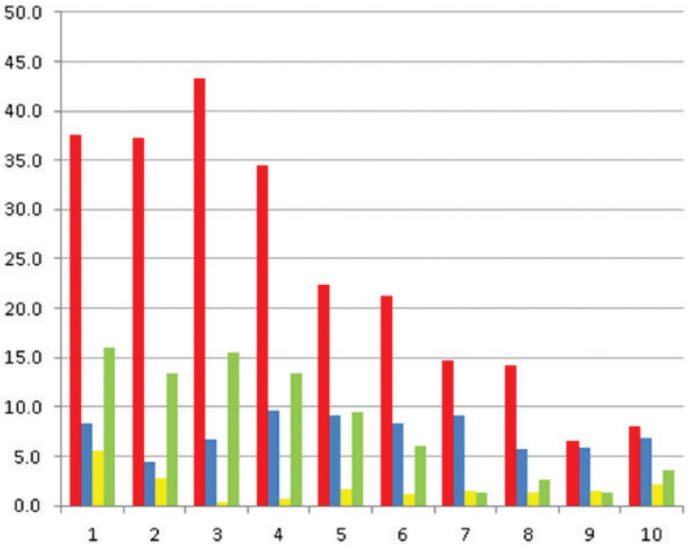
The 'Novel Clamp' is his concept and he has a current patent application. **The Molony Clamp** crushes across the whole scrotum or tail and is left on the animal to complete the removal of the required 'appendage'.

The official trial of these new Molony Clamps was conducted by the Scottish Rural University (formerly SAC) in Edinburgh, under UK Home Office rules, with excellent results.

Brian Eadie, a graduate engineer and creator of many patented products covering several industries is looking to manufacture the Novel Clamp for commercial agricultural use. His most successful inventions have been improved but necessary products for poultry and livestock. He has completed three business sales to global market leaders, since 1990, and all associated with products which make difficult jobs easier and more practical for farmers.

Brian Falconer, is a passionate practical and theoretical Graduate Engineer. Co-opted by Brian Eadie to design the new application system, he describes himself as a tinkerer and problem solver, adept at both analysing and solving problems (mathematically or otherwise) and then putting a solution into practice (with extensive hands on engineering skills).

Novel Clamp: official trial results



60 min time course of mean REQ scores (10 x 6 min bins)

Conventional RR and small sRR + Local Anaesthetic n = 8 (*Molony et al. 2012*)

Compared with the Combined and Novel clamp methods from this study, n = 6

- Standard RR
- Combined method
- Novel clamp
- sRR +LAn

The applicator used in these trials was a modified Burdizzo/Nipper. The Clamps included hand made products by Prof Molony and injection moulded products by Brian Eadie.

The following Abstract summarises the official trial, and the conclusions have been underlined.

Technical contribution: a more humane alternative to rubber rings for castration of older lambs (Ovis aries).

V Molony[1], SBM Prater[1], J Donbavand[2], B Eadie[3], JE Kent[1], and CM Dwyer[2].*

[1] Royal (Dick) School of Veterinary Studies, University of Edinburgh, Edinburgh EH25 9RG, UK.
[2] Animal and Veterinary Sciences, Scotland's Rural College, Roslin Institute Building, Easter Bush, Midlothian EH25 9RG, UK.
[3] Eadie Bros and Co. Ltd, Beechwood, Philiphaugh, Selkirk, TD7 5LU, UK.

Running title: *A humane alternative for castration of lambs*

Abstract:

The objective of this study was the welfare problem of severe pain suffered by lambs when castrated with tight rubber rings without effective local anaesthesia.

Quantitative assessment of pain-related behaviour, after castration with a novel clamp around the neck of the scrotum, was compared with that after castration by the combined method and with previous assessments of the effects of rubber ring castration with and without simultaneous injection of local anaesthetic.

Two groups of six lambs, 7-8 weeks of age, were castrated and pain-related behaviours were recorded for 60 minutes. Castration wounds were assessed every 2-3 days for 24 days.

Average active pain-related behaviour scores for lambs in each group were: clamp **18.8**; combined **73.1**, compared with **239.5** for rubber ring castration and **85.1** for rubber ring castration with simultaneous injection of local anaesthetic. The first clamp and necrotic scrotum were shed, spontaneously after 20-24 days and before any rubber rings used for the combined method. No consistent differences in the severity of the castration wounds were found between the two groups.

It was concluded that, castration with this novel clamp can be more humane than conventional rubber ring castration.

It remains to be determined if this method can be developed to permit farmers to carry it out quickly and easily under field conditions. If this can be achieved and if the method were to be accepted as sufficiently humane, un-anaesthetised lambs could be castrated without suffering more than the brief pain of clamp application.

Project to develop a commercial farm system

Managed by **Brian Eadie** and sponsored by **Eadie Bros & Co Ltd**

Start March 2019

Key requirements for farm use

Clamp

1. Light
2. Biodegradable
3. Healthy
4. Quick to load into the Applicator

Clamper

1. Light, single handed
2. Powerful
3. Controllable
4. Quick operation

Progress in 4 months to 30th June 2019

Clamp

1. < 12 grams
2. Biodegradable – 18 months – still researching
3. Anti-bacterial additive (Silver based)
4. Symmetrical, load to Clamper either way round – researching stack dispensing

Clamper

1. Single handed but currently oversized. Professional tool under development
2. Hydraulically powered for necessary 100kgs force
3. Finger trigger control to close, with separate lever to release. Redesigning to combine
4. Speed of operation under development but aimed at ringing time or max of 50% longer

Farm tests

Clamp on scrotum

Scrotum shed, clean wound

Next steps

UK Trials on basic product performance have reached final review stage, with only one more test of a hand unit to run mid July. No further lambs will be available until Spring 2020 in the UK, therefore trial facilities and support will be sought from other parts of the World.

The Clamper

Development of a production 'head' which can be powered in a variety of ways depending on farm size, will be completed by the end of August 2019.

Development of the 3 alternative power units (hydraulic-electronic, hydraulic, and mechanical) will take another two months, to end of November; hopefully no later.

The Clamp

This is being refined in conjunction with the Clamper to act as one cooperating system. It will be quickly loaded, and firm and 'healthy'. Environmental issues are being addressed by the consideration of materials and material additives, including any improved medical properties we can embed.

Dimensions and profile will be studied further too but these have been refined over the last few months already. Packaging for farm use will be optimised, possibly with some form of dispensing unit for rapid loading. Meantime they will be loaded manually until the industry demands a higher level of automation. Production tooling will be manufactured, and additional machines purchased for production.