MEAT RESEARCH REPORT

AMT
AUSTRALIAN MEAT TECHNOLOGY

Meat Research Report No. 1/94

Removal of Bonedust During Beef Carcase Sawing

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June 1994

J.M. Green, Regional Manager
Australian Meat Technology Pty Ltd

C. Giarrusso, Quality Assurance Manager
T. Egan, Plant Engineer
M.C. Herd Pty Ltd, Geelong

Australian Meat Technology Pty Ltd
ACN No. 059 733 425
P O Box 530
CANNON HILL QLD 4170

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Summary

A spray water kit fitted to a splitting saw is very effective in removing bonedust from beef carcases.

With this system there is very minor residual bonedust on the carcase, and less than with the normal practice, when carcases are washed after inspection and trimming. The system is being used for 40 to 400 kg dressed-weight carcases and has been in operation at a Victorian domestic abattoir since July 1993. Cold, potable water is used - 8 litres per carcase - but 45°C water would also be satisfactory.

The additional spray water system is also effective in cleaning the carcase's inside surface. The result is that no further internal washing is required. If any contamination is present (e.g. from a burst paunch), this must always be trimmed.

Water consumption in the final carcase wash has been reduced by over 50% since the spray system was installed. Elimination of the final carcase wash is considered a realistic objective for a works which can demonstrate a high standard of sanitary dressing backed up by a Quality Management Program.

The system is well suited to hot boning where sides are boned direct from the slaughter floor.

The spray water kit and splitting saw used in this research were supplied by Jarvis ANZ Pty Ltd.

The Spray System

The spray system requires the following components (refer to Figure 1).

Abattoir to Supply

- Isolating valve (cold or 45°C water supply)
- Solenoid valve (capacity 40 L/min at 500 kPa)
- Hose (3-4 metres)

Purchase from Jarvis ANZ Pty Ltd

- Forward spray jet kit (5 spray nozzles)
- Bracket
- Rectangular tubes
- Rear spray jet (1 spray nozzle)

The spray jet components are of welded construction for compact design. The rear spray jet must aim directly at the cutting position. Jarvis recommends that the saw is used in a horizontal position but this is not always possible and depends on the operators (who are of different height) and the design of the operator's platform. Abattoirs must be prepared to make a slight modification to the direction of this nozzle to suit the actual operation. A typical modification is shown in Figure 2.

With this spray water arrangement, nearby operators or inspectors are not affected by the spray system when used on carcases in the range of 40 to 400 kg dressed weight. Some installations may, however, need to consider shielding the vicinity of the saw.

The solenoid valve is located above rail height. The existing lubricating water supply is retained unmodified. The spray water kit is engineered and manufactured for a neat installation and does not affect routine maintenance, cleaning or band saw replacement.

An optional spray nozzle, pipe and bracket are also supplied by Jarvis. In our trials, this was not fitted and was not considered necessary. This nozzle may, however, assist sawdust removal if the results from rear spray and forward spray do not achieve optimum results.

FIGURE 1: SPRAY WATER SYSTEM FITTED TO JARVIS CARCASS SAW

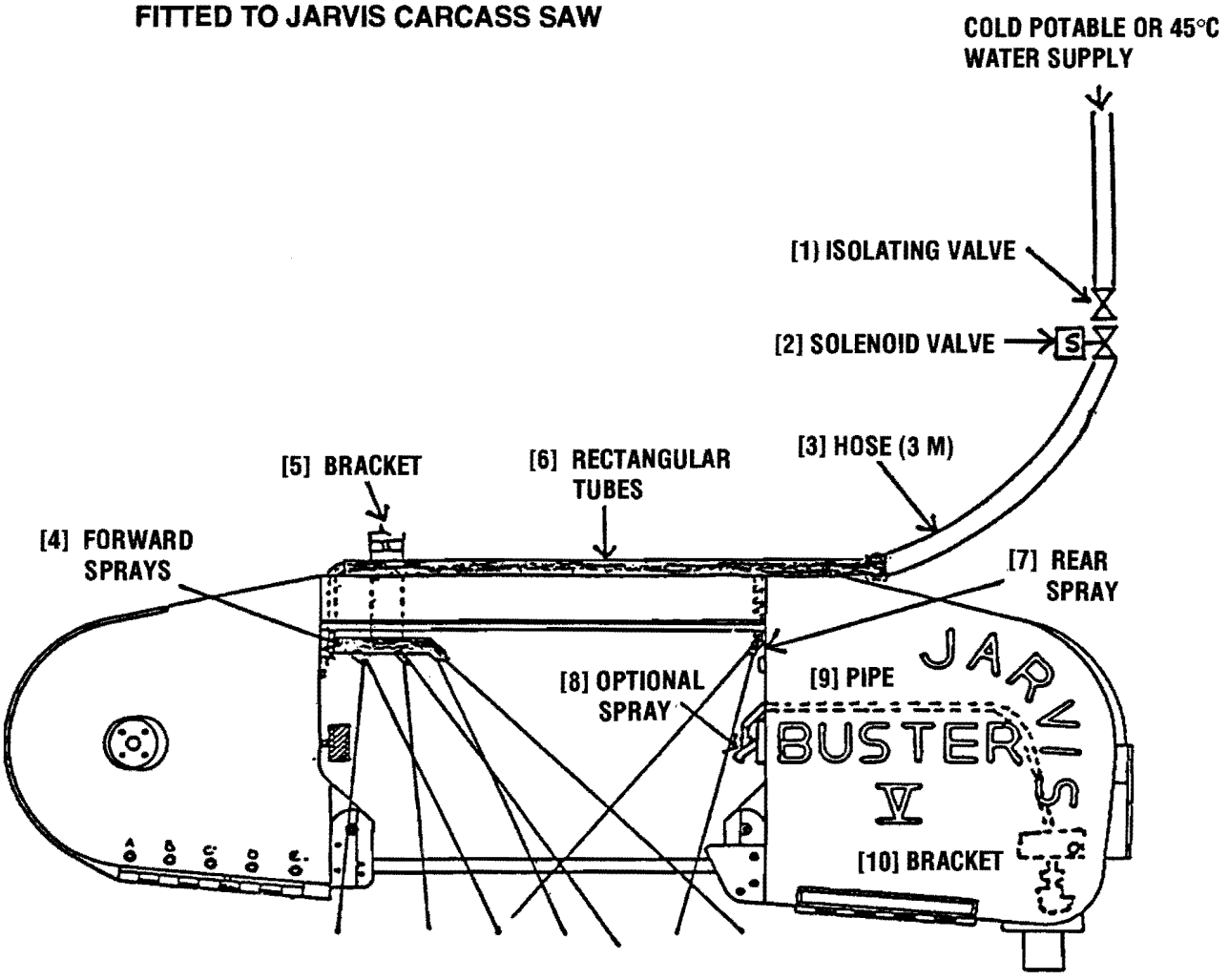
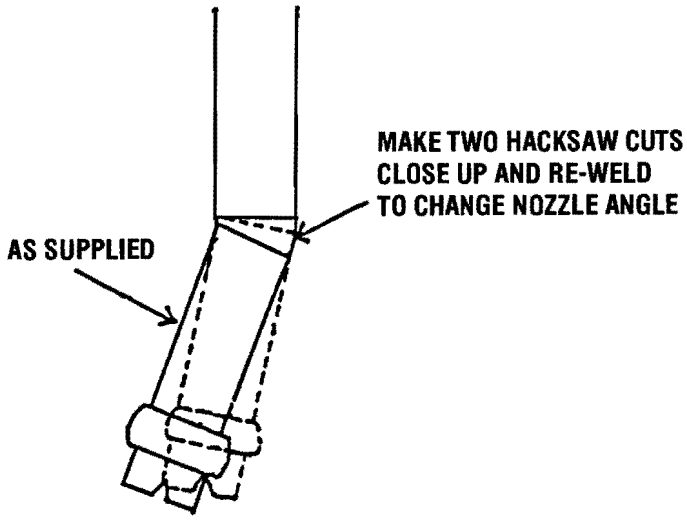


FIGURE 2: MODIFICATION TO REAR SPRAY (IF REQUIRED)



Operations

1 The operator starts the saw whilst clear of the carcase. The solenoid valve to the spray system opens.

2 The operator has two to three seconds to start sawing coinciding with water reaching the nozzles from the solenoid valve.

3 The operator splits the carcase in the usual manner (no modification).

4 The saw is turned off. The solenoid valve shuts - this allows the water in the hose to the saw to drain through the nozzles.

5 The saw is washed and sterilised, prior to the next carcase, in the usual manner.

The length of the hose between the solenoid valve and the saw (three to four metres) provides a time delay of about three seconds before water reaches the nozzles when the hose has drained empty. If operators require more precise control, a timer can be provided in the control circuit to the solenoid valve.

Dressing Procedures

For optimum results, kidney and channel fat should be removed prior to sawing. If this operation is carried out after sawing, additional blood is released which will require removal by separate washing.

Maintenance

The spray jets will require periodic replacement. If quality control personnel or saw operators observe poor performance (e.g. reduced effectiveness in removing bonedust), the following should be checked.

- Blocked or worn spray nozzles. Replace, if necessary. All spray nozzles have a limited life. (Refer CSIRO Meat Research News Letter 93/2 - *Spray Water Use in Meatworks*.)
- Low water supply pressure - 500 to 600 kPa is recommended.
- Blocked valves in water supply.

Can the Final Carcase Wash be Eliminated?

The spray system described provides clean, internal surfaces to carcases. Therefore, if works can maintain a high standard of sanitary dressing procedures, then they can consider elimination of the final carcase wash; however, contamination in two areas may need to be considered.

- Neck and brisket; trimming may be preferable to washing.
- Blood streaks on the rear hocks; this is largely cosmetic and may not be of concern to many customers as this is a low-value item.

Bensink (1970) studied the effect of carcase washing on the shelf-life of mutton carcases. The following treatments were evaluated in three abattoirs.

- No water added at any stage: carcases wiped with dry sterile cloths to remove blood and dirt.
- Carcases washed and the excess water removed using dry sterile cloths.
- Carcases washed only.

The shelf-life was comparable for all three cases.

Anderson, et al, (1992) have shown that carcase washing can cause surface bacteria to penetrate tissue during carcase washing. Cut surfaces were the most susceptible. The interior body cavity was the most resistant to surface penetration.

This system is ideally suited to hot boning where sides are deboned dry, straight off the slaughter floor.

In Sweden, carcase washing has been banned, other than to remove sawdust.

AQIS Approval

AQIS has approved this modification for domestic abattoirs. For export abattoirs refer AQIS letter of January 1994 (Appendix 1), and AMEFC General Circular dated 31st June 1994 (Appendix 2).

Acknowledgements

This Meat Research Report is based on research undertaken by the CSIRO Meat Research Laboratory.

The assistance of M.C. Herd Pty Ltd, Geelong, Victoria, and Jarvis ANZ Pty Ltd is acknowledged.

Enquiries

Enquiries should be directed, in the first instance, to

Jarvis ANZ Pty Ltd
Telephone 008-22 6357, Fax [02] 905 4841

or

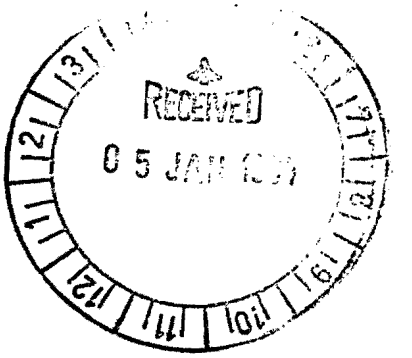
Mr John Green,
Australian Meat Technology Pty Ltd, Melbourne
Telephone [03] 541 3208, Fax [03] 541 3209

References

Anderson, M.E., Marshall, R.T. and Dickson J.S. Estimating Depths of Bacterial Penetration into Post-rigor Carcass Tissue During Washing. *Journal of Food Safety*, Vol 12. 1992, pp. 191-198.

Bensink, J.C. *The Effect of Washing on the Storage Life of Mutton Carcasses*. CSIRO Division of Food Preservation, Meat Research Laboratory, Technical Report 1/70.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE
DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY



Mr Barry Johnson
Manager
Technical Services Group
Meat Research Laboratory
CSIRO
PO Box 12
CANNON HILL QLD 4170

REMOVING BONE DUST DURING BEEF CARCASE SAWING

In response to your letter of 17 November 1993 and our phone conversation, AQIS is actioning EMIAC commitments as follows.

We believe that aerosol spray from the saw can be controlled by shielding and other precautions, as necessary. AQIS approval would be subject to on-site demonstration that aerosol spray is effectively controlled.

In relation to whether the spray would mask the presence of disease before post-mortem inspection, AQIS has approached the US Food Safety and Inspection Service to determine their policy. Unconditional AQIS approval will depend on the US response.

I will advise you as soon as we hear from them.

Jeff McMahon
Senior Principal Veterinary Officer
Meat Inspection Branch

APPENDIX 2

AUSTRALIAN MEAT EXPORTERS' FEDERAL COUNCIL

AMEFC

NEWSBROADCAST

Level 17, 219 Elizabeth Street Sydney 2000 Australia Phone: 61 2 267 3411 Fax: 61 2 267 5665

21st June 1994

Gen Circ No 149/94
A.C 149/94

SPRAY ATTACHMENTS TO CARCASE SPLITTING SAWS

AQIS has reported as follows in the agenda papers for the 29th June EMIAC meeting.

QUOTE

The last EMIAC meeting was advised that AQIS would accept the modifications to beef carcase splitting saws provided adequate precautions are taken to prevent aerosol overspray contaminating other slaughter areas and provided contamination is removed before spread by the spray water. Installation or use of spray attachments would be with the knowledge that advice has not yet been received from US authorities about their acceptance (or otherwise) of such equipment.

AQIS's Veterinary Counsellor in Washington has been informed by the Equipment Branch, US Food Safety and Inspection Service that:

> "Carcass splitting band saws with special water spray mechanisms are not to be operated with the water spraying while the carcass is being sawed. The spray is to be activated after the carcass is split and the saw is in the down position. The use of the spray does not eliminate the need for a saw sterilizer in case the saw cuts into an abscess".

In effect, this prevents use of spray attachments to remove bone dust during carcase splitting.

AQIS has asked the Veterinary Counsellor to find out if spray attachments are used in North America and, if so, what restrictions are placed on their use.

UNQUOTE