

final report

Project Code: A.MQT.0043
Prepared by: Barry Lee

Date published: November 2010

PUBLISHED BY
Meat and Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Business development and facilitated adoption of accelerated tenderness and value-adding technologies (Very Fast Chilling, SmartShape and Stretch) – Phase 3

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

This publication is published by Meat & Livestock Australia Limited ABN 39 081 678 364 (MLA). Care is taken to ensure the accuracy of the information contained in this publication. However MLA cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of MLA.

Final report to MLA on achievements and recommendations on commercialization issues for MLA's industry adoption plans.

Success in achieving milestones

- Teleconference with project team conducted 23 March 2010.
 - Introductions and confirmation of project hand-over to P Jones
 - Outstanding project issues addressed and actions agreed.
 - Minutes of team teleconference and actions documented (refer Appendix A).
 - Contact details for project team updated/confirmed per minutes of meeting.
- End of project and handover meeting completed with G Waldthausen and P Jones at MLA 23 March 2010. Following reports prepared and reviewed:
 - Consolidated report of all industry demonstrations (refer Milestone 5 report).
 - Status of MDC projects with key contact details (refer Appendix B).
 - Summary of meetings with key potential commercialisers (refer Appendix C).
- Proposed project timelines for 2010
 - Updated PowerPoint slide prepared and distributed. (Separate attachment).
- The Information Memorandum for potential commercialisation partners is under final draft and review by B Lee and P Jones.
- For reference, a note on other relevant technologies (Pi-Vac and Hamax is shown at Appendix D)

APPENDIX A

MINUTES OF TELECONFERENCE MEETING

Subject: SmartShape/Stretch – Team Review of Status of MDC Projects and Commercialisation
Time/Date: 1.00 – 1.55pm Tuesday 23 March 2010
Location: North Sydney
Attendees: George Waldthausen (GW), Peter Jones (PJ), Arthur Pitt (AP), David Hopkins (DH), Johanne Taylor (JT), Barry Lee (BL)
Copy: Phil Green (PG), David Carew (DC)

Meeting Purpose:

- a. Introduction/handover to Peter Jones
- b. Review of recent issue with splitting rubbers at Greenhams
- c. Review status of other MDC projects
- d. Commercialisation plans.

Supporting Documents:

- a. Powerpoint Project Timeline (Dated 24 March 2010)

MINUTES

1.0 Overview

- Peter Jones shall be co-ordinating SmartShape-Stretch MDC projects following completion of Barry Lee's work at end of March.
- Peter shall also co-ordinate MLA issues during George Waldthausen's period of leave 29 Marc – 16 April.

2.0 Greenham's MDC

- Splitting rubbers
 - New rubber from NZ received by JT.
- **Action 1. JT to travel to Tongala and install the new rubber and assist with processing of samples for Peter Greenham Tue 30 March.**
 - Greenham's to retain system till 9 April, to allow for loss of 1 week of processing/operation.
- **Action 2. JT to liaise with Darren at Greenhams for system to be removed and transported thereafter to Wagga Wagga.**
 - AP discussed need for operational care re: size of meat and rubber opening during processing
 - AP noted that rubbers in NZ have also had an issue with splitting and this may be due to quality of mixing of the rubber compound during molding.
- **Action 3. AP to send 'spare rough and ready' rubber to JT as a further last back-up.**
 - AP advised that 10 further rubbers has been ordered and due date is 29 April.
- **Action 4. Upon receipt, AP to inspect/test and send 5 rubbers to JT for spares.**
- Sensory assessment of samples by I&I NSW
 - BL has followed up with B&J and they shall NOT BE the site for sensory assessment
- **Action 5. JT to organise sensory assessment of samples at Orange Agricultural Institute during w/c 12 April.**
- **Action 6. BL/JT to organise for samples for sensory assessment to be sent to Orange.**

- Packaging
 - JT advised that Cryovac are unable to supply poly tubing
 - **Action 7: JT to confirm quote and order further 82mm packaging supplies from Phase 3 packaging.**
- Other
 - Note: Use of new G2 tenderometers as received in Australia are subject to retrofit by AP.

3.0 Cargill's MDC Project

- This project is subject to final MLA approval.
- In view of the above Greenham project issues, it is important that the newly replaced rubber be tested at Greenham's before the system is taken to Cargill's Wagga Wagga.
- Target date for Cargill's MDC is now 19-29 April.
- **Action 8: PJ - Subject to Greenham's rubber replacement/testing, Cargill's be advised of new potential project dates.**
- **Action 9: PJ – JT and PG be advised of revised project dates when confirmed.**

4.0 Gotzinger MDC Project

- New hand samples to be produced and CBA updated
- **Action 10: D Carew and P Green to meet 15 April and prepare hand-samples and update CBA**
- **Action 11: PG, Gotzingers: New samples to be shown to customers**
- **Action 12: PJ - Subject to Action 9/10, Go-No Go meeting date to be confirmed for end of May (when Tony van der Drift and Phil Green shall be available).**

5.0 Chefs Partner MDC Project

- Customer feedback on samples remain outstanding
- Chefs to update CBA and report subject to feedback.
- **Action 13: PJ - Subject to Chef's advice, Go-No Go meeting date to be confirmed for end of May (potentially same date as Gotzingers meeting).**

6.0 Commercialisation Plans

- MLA has met with a number of potential companies who may be able to commercialise/distribute/market the system in ANZ and internationally.
- Proposals shall be invited from these companies and shall be reviewed by MLA
 - Target Date for proposals: May-June 2010.

7.0 Contact Numbers

- For reference, below is an update of contact details for the project team :

	Name	Organisation	Telephone	Email
1	George Waldthausen	MLA	02 9463 9306 0411 241903	gwaldthausen@mla.com.au
2	Peter Jones	MLA	0419 469877	pjones@mla.com.au jones.pg@bigpond.com
3	David Carew	MLA	0419 696106	dcarew@mla.com.au
4	David Hopkins	I&I NSW	02 63 49 9722	david.hopkins@industry.nsw.gov.au

A.MQT.0043 – Business Development and facilitated adoption of accelerated
tenderness and value adding technologies

			0428 279 942	
5	Johanne Taylor	I&I NSW	02 6349 9741 0428 655347	Johanne.taylor@industry.nsw.gov.au
6	Phil Green	Greenleaf Enterprises	0412 141385	pgreen@greenleaf.com.au

8.0 Summary and Actions:

	Action	Who
1	Travel to Tongala and install the new rubber and assist with processing of samples for Peter Greenham Tue 30 March.	JT
2	Liaise with Darren at Greenhams for system to be removed and transported thereafter to Wagga Wagga.	JT
3	Send 'spare rough and ready' rubber to JT as a further last back-up.	AP
4	Upon receipt, AP to inspect/test and send 5 new rubbers to JT for spares	AP
5	Organise sensory assessment of samples at Orange Agricultural Institute during w/c 12 April.	JT
6	Organise for samples for sensory assessment to be sent to Orange.	BL/JT
7	Confirm quote and order further 82mm packaging supplies from Phase 3 packaging.	JT
8	Subject to Greenham's rubber replacement & testing, Cargill's be advised of new potential MDC project dates.	PJ
9	JT and PG be advised of revised Cargill's project dates when confirmed.	PJ
10	D Carew and P Green to meet 15 April and prepare hand-samples and update CBA for Gotzingers project	DC/PG
11	New Gotzinger samples to be shown to customers	PG/Gotzingers
12	Subject to Gotzinger's advice, Go-No Go meeting date to be confirmed for end of May (when Tony van der Drift and Phil Green shall be available).	PJ
13	Subject to Chef's advice, Go-No Go meeting date to be confirmed for end of May (potentially same date as Gotzingers meeting).	PJ

APPENDIX B

MDC Project Status as at 24 March 2010

(Prepared: Barry Lee)

NOTE: Commercially Confidential – removed from public report

APPENDIX C

Summary of Meetings with Potential Commercialisers for SmartShape-Stretch (Updated B Lee 24 March 2010)

NOTE: Commercially Confidential – removed from public report

APPENDIX D

Comparison with Other Technologies

Hand wrapping using standard “Bazooka” filling equipment has been done on cold based product for many years, but this process is non-viable commercially for large volume production. Commercial applications for hand wrapping of primals exists only for premium valued products where the high labour costs and time required to complete the process, makes it still profitable. Often several layers of film are required to provide the necessary tension on the product, and this causes colour problems and inconsistent & uneven stretching of product due to varying degrees of manual pressure being applied right across the primal. The film is later removed and the muscle is often re-packaged again for sale, making the cost of packaging and double-handling quite expensive.

Experience has shown that when the meat is forced along a tube either by compressed air, vacuum or pneumatically driven rams, the muscle is not given time to elongate and re-align and hence widespread tearing between bundles can occur. Often meat folds over on itself making it difficult to control fibre direction. With normal variation in muscle cuts, current commercial stuffers are not able to apply pushing pressure or the stretch, which is achievable with the SmartShape™-SmartStretch technology. Our technology provides unique stretching with fibre alignment across the entire cut and provides the distinct advantage of control over stretching and shaping.

To our knowledge, there are no known commercial technologies that can deliver the same level of control for stretching and shaping evenly across the primal. However, there are two other commercial technologies that are targeting similar principles and a third based upon a meat strip alignment process, all of which aim to improve tenderness and eating quality. These currently available systems are not widely used in Australia.

1) Whole Muscle Stuffer

The Hamax 800 was developed for stuffing larger cold-boned muscles (such as loins) directly into artificial casings. The Hamax offers a fast and efficient operating procedure, which until now has been very labour intense and time consuming. It becomes even more efficient when working with pre-shirred casing and combined with a double clipping system, to eliminate pre-clipped individual casings.



Hamax 800 - A commercial meat stuffer by Wolf-tec

(Source: <http://www.wolf-tec.com/268.0.html>)

The basic method for operation is the whole muscle is loaded into the pressing chamber. The chamber “mould” is fitted to products allowing them to be compressed and formed in shape. It is then stuffed through the horn assembly and pushed into the casings. If connected to a

double clipper, a position sensor signals that the proper length has been met before clipping the product and retracting the hydraulic piston for the next cycle. If fitted with the optional “cut-off” knife, whole muscle product can still maintain exact length requirements.

The advantages as outlined by the manufacturer (Wolf-tec) include:

- Fast and efficient operation
- Capacity up to 2,600 lbs/hr.
- Only one person needed to operate
- Caliber precise filling with perfectly defined length
- Pre-forming
- Direct connection to an automatic double clipper
- Reductions of product loss up to 50%
- Reductions in casing loss up to 30%

The disadvantages of the Hamax 800 is that it is manually hand loaded and ideally only suited to larger muscles (such as loins) that are stuffed directly into a one-size fits all artificial casing. These bigger cuts have a tendency to tear, while smaller cuts are at risk of folding over.

2) Pi-Vac system

The Pi-Vac packaging system, also known as elasto-pack, exerts pressure on all surfaces of the meat throughout its entire shelf-life.



A permanently elastic gas barrier film is expanded in the packaging machine to allow the packing of fresh meat, with attractive presentation. In contrast to conventional vacuum packaging systems, with the Pi-Vac packaging system it is no longer necessary, to evacuate air out of the package.

The disadvantage of this system is that the pressure is not applied evenly and the packaging rounds off each end (i.e. pillow packs), resulting in inconsistent and uncontrolled stretching across the primal. Consequently, there is uneven portion control during slicing.

Teagasc, in Ireland, was assisting in the development of the Pi-Vac system as a “novel hot-boning and chilling procedure for the processing of beef cuts”. The cited potential benefits to the industry, included increased meat yield, reduced energy costs resulting from less chiller space and a saving of refrigeration input, quicker throughput of meat in the packaging plant and a reduction in transport costs and labour. In this system, the carcass is hot-boned and the hot meat is tightly packaged in elasticated film using a “Pi-Vac” machine. Teagasc claimed the new system overcame two major disadvantages associated with hot-boning: the toughening which is caused by muscle contraction during chilling of hot-boned meat, and shape distortion of the hot-cut meat. PI-VAC operates by stretching tubes of elastic film to the inside wall of the packaging chamber. The hot muscle is inserted into the chamber, pressure is released and the film returns to its original dimensions. The meat forms into the shape of its constraining pack and the muscle shape is not distorted. The restraining force of the film hinders muscle contraction and thereby prevents toughening. Using this new system hot-boned meat packed in Pi-Vac can be chilled quickly producing beef of consistent tender eating quality. Using this system variability of tenderness will be reduced as individual muscles can be treated optimally.