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# AUTOMATION TECHNOLOGIES ARE VIEWED AS CRITICAL FOR THE FUTURE GROWTH OF NEW ZEALAND'S SHEEP MEAT INDUSTRY.

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Ovine Automation Limited (OAL) is a consortium of sheep meat processors, researchers and Government. It was set up in 2009 to develop robotics for commercial sheep meat processing in New Zealand.

OAL's work has proven there are significant opportunities for automation to improve productivity and regulatory compliance of product, and create safer working environment. It has shown that robots can be effectively integrated in commercial plants, operating side by side with meat workers.

The consortium has worked with two of New Zealand's leading robotic development organisations: the Crown-owned entity Callaghan Innovation (formerly Industrial Research) and engineering company Milmeq.

Robotic platforms have been developed for all of the key steps involved in processing a sheep carcass from slaughter to dressing, including

evisceration, de-pelting and key cuts. Through engaging closely with agencies, regulatory acceptance has been gained for use of the robots in the food processing environment. In 2013, OAL along with Callaghan Innovation won an award for Collaboration at the KiwiNet Research Commercialisation Awards.

This briefing provides an overview of OAL's \$14.8 million investment in robotics and the 10 technologies in the OAL portfolio. Two of these robots are now ready to operate in commercial environments and a suite of others are nearing release. Automation of sheep meat processing is now a reality.



Ovine Automation's work has shown that robots can operate safely and effectively in commercial plants, side by side with meat workers.

TECHNOLOGY	LABOUR SAVING	COMPLIANCE	HEALTH & SAFETY	ADDITIONAL BENEFITS	NEXT STEPS
Stearine bung	✓*	✓		Cheaper than current technologies Process friendly as tallow is recycled via rendering	Automation and commercial development
Gas De-pelting		✓	✓	Improves carcass and pelt quality Produces cleaner hind leg	Commercial installation
Y cut	✓	✓	✓		Commercially available
Pelt rolling - Leg roll - Brisket roll - Combined	✓	✓	✓		Commercially available
Forequarter clearing	✓		✓		Development of kinetic rig
Ultrasonic knife		✓	✓	Improved pelt quality	Build commercial unit
Belly rip down	✓*	✓	✓		Development of additional functionality and automation
Sock split	✓	✓		Potentially improves shelf life by reducing carcass contamination	Further development of cutting effector
Brisket cut	✓		✓		Commercially available
Evisceration	✓		✓	Potential to integrate with new post mortem inspection procedures	Commercially available

\*If automated

## 2014 BRIEFING

Ovine Automation Limited has advanced the development of 10 robotic technologies.

This work has shown the productivity, safety and quality benefits of using automation in New Zealand sheep meat processing plants.



### 1. STEARINE BUNG

The bugging device delivers a solution of tallow-based stearine into the anal cavity of the carcass, where it solidifies and forms a seal to prevent carcass contamination. While currently hand-held, it can also be automated.



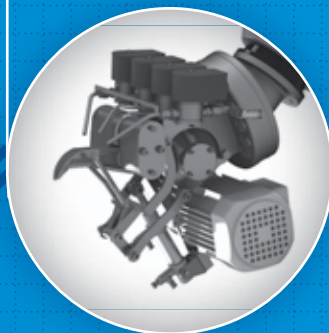
### 2. GAS DE-PELTING

Gas de-pelting involves injection of food-grade air between the pelt and the hind-quarter area of the carcass. Trials have shown that this makes it easier to remove the pelt without damaging the carcass or the pelt.



### 3. Y-CUT

The cutting head mounted on this robot accurately and effectively opens the pelt from the forequarter down the neck. The robot replaces a physically demanding task on the production chain and minimises cross-contamination to the carcass.



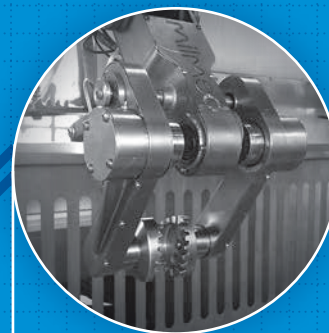
### 4. PELT ROLLING

Automated pelt rolling technologies improve productivity and compliance, as well as addressing safety issues. Using the same gripper head, there are three variants of this technology designed to roll the pelt over the brisket:

**Leg roll:** designed to roll the pelt down the fore legs on high-speed chains.

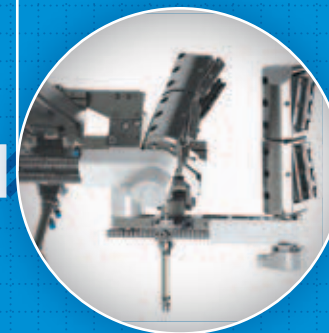
**Brisket roll:** in conjunction with the leg roll machine, designed to roll the pelt over the brisket on high-speed chains.

**Combined leg and brisket roller:** combines the leg and brisket roll functions on one unit for use on slow-speed chains.



### 5. FOREQUARTER CLEARING

Forequarter clearing continues the pelt removal process around the fore-quarter and neck areas. It saves on labour and improves compliance. The prototype unit has been trialled and proven on a static rig and is undergoing further development.





# OAL ROBOTICS PROJECTS



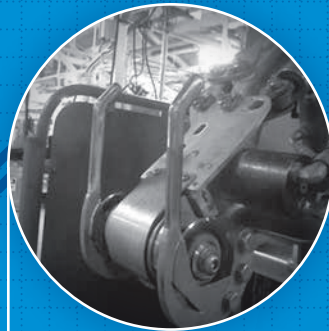
## 7. BELLY RIP DOWN

The belly rip down tool splits the pelt from the brisket to the hind legs, injecting air to aid cutting. While currently hand-held this device will be mounted on a robotic platform and developed further to perform additional tasks.



## 9. BRISKET CUTTER

The brisket cutter splits the rib cage of a de-pelted carcass. The specialised cutting head is mounted on 6-axis robot that sits outside the processing chain.



## 6. ULTRA-SONIC KNIFE

The ultra-sonic knife uses specially tuned vibration to separate the connective tissue between the pelt and the carcass. A hand-held ultra-sonic knife has been developed, and trials show it provides a cleaner cut and – with no moving parts – it is safe, quiet and easier to maintain.



## 8. SOCK SPLIT

The sock splitter opens the pelt on the hind leg to reduce stress when the pelt is pulled off the carcass. Automation of this step reduces labour input and significantly reduces cross-contamination of the carcass, which has potential benefits for product shelf-life.



## 10. EVISCERATION

The eviscerator automates the removal of internal organs from a carcass, preventing costly work injuries and providing significant labour savings. The robot uses sensors to align the head with the carcass and removes the internal organs in a single scoop movement.



# OAL REGISTERED PATENTS & TRADE MARKS

(including held on behalf of)

INVENTION	DATE	PATENT NUMBER	COUNTRIES
Skid carrier	25/08/2011	NZ594533, AU2012216416	NZ/AU
Evisceration scoop	08/09/2009	NZ597555	NZ
Brisket cutter	04/08/2010	NZ585797, AU2011205155	NZ/AU
Skid stabliser	19/07/2010	NZ586881, AU2011204829	NZ/AU
Grabber	09/12/2009	NZ581870, AU2010249206	NZ/AU
360 Degree sock ringing	22/05/2012	NZ600137, AU2013203852	NZ/AU
Driving mechanism	22/07/2013	NZ626719, AU2014204496	NZ/AU
Clamping mechanism	22/07/2013	NZ626765, AU2014204551	NZ/AU
Belly rip down tool	18/09/2013	NZ629399, AU2014227479	NZ/AU
Forequarter roller	27/02/2014	NZ631453	NZ

TRADEMARK	DATE	TRADEMARK NUMBER	COUNTRIES
OAL	05/10/2010	NZ831412, AU1409178	NZ/AU

## Shareholders & Investors

Alliance Group Ltd  
ANZCO Foods Ltd  
Auckland Meat Processors Ltd  
Blue Sky Meats Ltd  
Crusader Meats Ltd  
Ovation New Zealand Ltd  
Progressive Meats Ltd  
Silver Fern Farms Ltd  
Taylor Preston Ltd

## Investors

Ministry of Business,  
Innovation and Employment

MIRINZ Inc  
(During first year - Meat Industry  
Association and Beef + Lamb  
New Zealand Ltd.)

FURTHER INFORMATION:

[www.mia.co.nz](http://www.mia.co.nz)