



final report

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Automated boning room – loading and x-ray integration

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Executive summary

- X-Ray/Primal sub-system upgraded and working well.
- Hindquarter machines upgraded to the latest specification.
- Hindquarter Auto-loading fitted and working well. Volume trials have proved reliable.
- X-Ray hardware repositioned to afford a better hindquarter view on the image.
- X-Ray software for hindquarter boning now assisting the boning task.
- Hindquarter machines now have automatic knife changing.
- Hindquarter machines now have split aitchbone handling.
- The system is now commercially viable, with the first commercial order having been received for a New Zealand processor, and a substantial level of interest from others.

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1 MLA Project Objectives

- Auto-loading prototype
- Upgrade of Hindquarter machines for integration into the automated boning room
- X-Ray and Hindquarter machine integration

2 Overall Status

2.1 MLA Milestone 1 – Design Cell Layout & Auto-loading

The cell layout was designed to integrate the Hindquarter machines with the existing Primal system and X-Ray system. In principle it is possible to site the Hindquarter machines in a number of locations and orientations. However, the ideal siting (from a machine perspective) is that which was chosen for the development with the machines in line with the Primal system and the hindquarter feeding system linked with the Primal transfer system.

The auto-loading system has been designed to take the hindquarters directly off the feed rail using an RTL-developed degambrelling system. The degambrelling system operates at a cycle time fast enough to allow the removal of the hindquarters within the 10 carcass/minute transfer cycle time, picking up every 5th hindquarter from the rail. (Note that 5 Hindquarter machines are required to achieve 10 carcasses per minute). RTL intends to file a patent application for the auto-loading system by the end of October, thus this aspect in particular must remain confidential until that time.

2.2 MLA Milestone 2 – Manufacture H/Q Auto-loading

The manufacture of the auto-loading system proved to be much more costly than earlier anticipated, largely due to the amount of re-work necessary as the system was developed. For this reason, an assessment was made of the benefit of having a second auto-loading system as part of the development. Given the nature of the machine concept, in which it was easy to visualize the effect of having two auto-loaders and it was clear that multiple auto-loaders would work, the decision was made not to proceed with the second autoloader.

2.3 MLA Milestone 3 – Upgrade, Install H/Q Machines & Auto-Loading; Upgrade Primal System

The Primal and Hindquarter systems have now been upgraded to a commercially useful demonstration level. Upgrades to the Primal system include:

- Incorporation of circular knife cutting
- Revised forequarter clamping system to accommodate circular knife cutting and xray measuring
- New servo-pneumatic control to give more reliable functionality and allow a 10 carcass/minute cycle time

Upgrades to the Hindquarter machine include:

- Clamping aitchbones to ensure they do not split during processing
- Addition of automatic knife changing
- Incorporation of operator cut-path adjustment
- Integration of the Auto-loading unit

- Software modifications to accommodate the above features

2.4 MLA Milestone 4 – Develop & Verify Software for X-Ray Measuring

- The x-ray hardware has been repositioned and re-calibrated to enable a better view of the hindquarter region. The analysis software has been modified to suit.
- Software has been written to analyse the hindquarter and determine the positions of the pin-bones to allow greater accuracy in hindquarter de-boning.

3 Intellectual Property

The project incorporates RTL technology patented as follows:

- X-Ray system:
 - NZ548648 patent pending
 - PCT/NZ07/000191 patent pending
- Primal system:
 - NZ540749 patent granted
 - GB2441935 patent pending
 - AU2006258328 patent pending
- Primal Circular knife variant:
 - NZ552333 patent pending
 - GB0725152 patent pending
 - AU2007249141 patent pending
- Hindquarter system:
 - NZ536588 patent granted

A patent application is yet to be filed for the autoloading, so details of this element need to remain confidential until further notice.

4 Video

A video of the system has been prepared for MLA. As this contains details of unprotected Intellectual Property, this video must not be shared outside of MLA without RTL's approval.