

White Paper: Key findings and recommendations

Red meat processing plants are unsure of the precise financial benefits per carcass type when using Rinse & Chill® Technology (RCT) from MPSC. Processors pay MPSC a fee per head, therefore processors apply RCT to the stock they own, however, for over the hooks (OTH) purchases, processing plants often choose not to rinse as they pay a rinse fee to MPSC and pay to producers the hot standard carcass weight (HSCW) gain. The purpose of this project was to calculate the lost meat revenue to the supply chain due to consigned OTH animals not being rinsed using data from processing plants.

Rinse & Chill® provides financial gains which are currently captured by the processors when rinsing their own stock. The financial gains are attributed to increase in saleable meat, heart and liver yields and increase in boning room throughput (kilogram per labour unit per hour).

The loss in industry value due to existing MPSC customers in Australia not rinsing due to OTH purchases was calculated and estimated at \$10.8 Million per year based on 2023 data.

The value of improved presentation of carcasses was identified but not included in financial monetary gain for the supply chain. Other benefits of RCT included a decrease in offal temperatures which removed the need for ice water baths and or improved product quality due to the temperature reduction prior to packing.

The cost to rinse compared to the monetary gain for mutton sold as 6-way when margins are tight (between buy and sell price) is not always financially beneficial. A mutton processor noted they continued to rinse even when margins were tight due to rinsed carcasses having increased blood removal and improved carcass presentation. The value of improved carcass presentation was not valued and included in the financial implications of using Rinse & Chill®.

The value proposition per carcass per animal type for lamb, mutton, light and heavy beef animals (Angus and Angus cross) were calculated. The financial gain is animal type, purchase price and saleable product dependent. The saleable meat yield and boning room gains of rinsed beef products means it is economical for the processors on heavier boned out carcasses to utilise RCT on own stock and OTH purchased animals.

Through the use of RCT the optimisation of carcass homeostasis resulted in increased dressing percentage for mutton of 0.95% (\$3.18) with an increased saleable heart (13%, \$0.15) and liver (6.8%, \$0.13) with total financial benefit of \$3.46 per head. The overall supply chain benefit of using RCT for a mutton plant is \$5.52 based on the data collected during the trial undertaken in this project.

Beef cattle trials undertaken in this project included grassfed Angus and Angus X steers and heifers categorised as light (400kg liveweight) and heavy (587kg liveweight). Raw data from previous beef cattle trials on cull cows were also analysed. Dressing % increase ranged from 1.57% for light animals through to 3.58% for heavy animals giving a benefit of \$33.82 and \$71.71 per head in red meat and offal sales. The range of increase in value for hearts averaged from \$5.50 for light animals to \$8.65 for heavy stock and \$3.04 to \$4.46 for livers. Boning room benefits were not able to be calculated as product in the trial was sold as whole carcasses.

It is financially viable for processors to rinse larger (well-muscled) animals purchased OTH (paying MPSC the rinse fee plus the producer the HSCW gain) due to the financial gain on the hearts, liver and increase in saleable meat yield post hot carcass scales.

Rinsed sheep and beef heart surface temperatures were more than 7°C colder for both species. Rinsed beef liver was 5°C cooler than the control while sheep livers were 2.4°C cooler.

The benefit of using RCT varied between lot (vendor) and carcass type. To understand when it is financially viable for processors to rinse OTH purchased animals the following weights are required for individual carcass type cost benefit analysis:

- 'Liveweight' or post exsanguination weight
- Pre-rinse weight
- Post rinse weight
- Post evisceration weight
- Hot standard carcass weight

Not all financial benefits of using RCT could be easily modelled with the data available. Benefits observed by the researchers and not included in the cost benefit modelling included:

- Improved presentation of carcasses
- Improved presentation of 6-way product
- Less trimming required in the neck and forequarter regions
- Packing colder livers and hearts (reduced energy draw on plate or blast freezers)

Factors influencing profit margins of using Rinse & Chill®

The variables impacting the financial implications of using RCT was documented. Key factors include livestock buy and sell differential, livestock types, carcass attributes, type of products sold and market outlets.

The variables which need to be considered when looking at each individual processing plant's value propositions include:

1. Animal ownership and carcass type: OTH versus owned animals
 - a. The full benefits of rinsing are retained by the processor for owned animals.
 - b. The financial viability (not considering carcass appearance attributes) of rinsing OTH in smallstock is dependent on the buy – sell price differential.
 - c. It is financially beneficial to rinse OTH heavier cattle based on individual carcass cost benefit analysis undertaken.
2. Offal processing and packing
 - a. Pre-chilled offal improves flow of product in the offal room.
 - b. Cooler livers start the cold chain earlier and supports improved temperature decline in the freezers.

3. Product sales
 - a. Carcase sales – benefit gain is carcase presentation and increase in saleable product
 - b. 6-way – benefit gain is cut presentation and increase in saleable product
 - c. Boned product – Easier to bone according to boning room managers. Less trimming required in the neck region and increase in saleable product. Rinsed beef products can be sold in all markets except Korea. Rinsed sheep products can be sold in all markets and countries.
4. Labour availability
 - a. One to two people are required to operate RCT on plant.

Through the research project it enabled documentation and validation of the data requirements to better understand what is possible and what is required for an OTH trim adjustment. To facilitate an OTH trim adjustment it needs to take into pregnancy status, digesta weight and pelt weight for sheep.

The sheep trial documented the order of carcase flow from rinsing through the retain rail and to the hot scales. This analysis identified a minimum of 10% of the sheep carcasses were out of order for the mob involved in the trial. For smallstock plants with a separate retain rail RFID gambrel tracking would be required to enable individual carcase OTH trim adjustments.

This research was the first time the surface temperature differentials were quantified between rinsed and control hearts and livers. Measuring and quantifying the significantly cooler surface temperature of the beef hearts (32°C down to 24°C) and livers (32°C down to 27°C) was important to help processors understand the benefits of Rinse & Chill® relevant to each processing plant's offal operations. The cooling of the liver's pre-evisceration provides energy and water saving opportunities.

Future research

- The beef trial animals were sold as whole carcasses. Future research programs to quantify the processing plant and supply chain benefits should include boned out carcasses to measure meat colour, boning room efficiencies and boning room throughput at an MSA accredited plant.
- The sheep trials were mutton from one vendor. Future trials should include lamb and multiple vendors to measure boning room efficiencies, boning room throughput and impact on saleable meat yield across vendors.
- Data points were identified which could support OTH trim adjustment however research trials are needed to identify commercially viable ways collect the data and link the data to individual carcasses.

Recommendations

- The value of Rinse & Chill® is processing plant dependent. The variables to calculate the cost benefit analysis for individual processing plants has been documented to enable an informed decision.
- An OTH trim adjustment where value created is shared between processors and producers would facilitate greater industry adoption and rinsing of OTH owned animals in processing plants where RCT is currently installed.