Snapshot report

RFID Sort Chiller

Automated RFID Beef Chiller Carcase Sorting System

Project code
2021-1213

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Project description

Harvey Beef have identified the opportunity to create a carcass sorting system using RFID, Emydex processing and programmable logic controller (PLC) systems along with mechanised pushers. This system will automatically and correctly identify and sort beef sides, extending traceability and feedback for each beef side through the chilling and grading process. This automated process directs sides into pre-determined sorting/boning groups within the chiller based on post chill MSA grading, and then outfeeds them into the boning room as required, without the need for manual pushing of sides.

Project content

This project aims to demonstrate the viability and measurable benefits derived via:

• Improved efficiencies

• Reduction in both time taken, and production errors

• Increased productivity via throughput

• A reduction in required labour units

• A positive cost benefit and ROI analysis

The system operates as per below:

Carcase sides are graded at the weigh station on the Slaughter Floor, where they are assigned a chiller grade and an RFID assigned to individual carcase skids, this information is stored on EMYDEX. The carcase sides are loading into pre-sort chillers creating the days carcase inventory. Post overnight chilling the MSA grader will grade carcases and update grading as required on the data capture unit (DCU), the final grade is uploaded into EMYDEX and updated on the RFID chip.

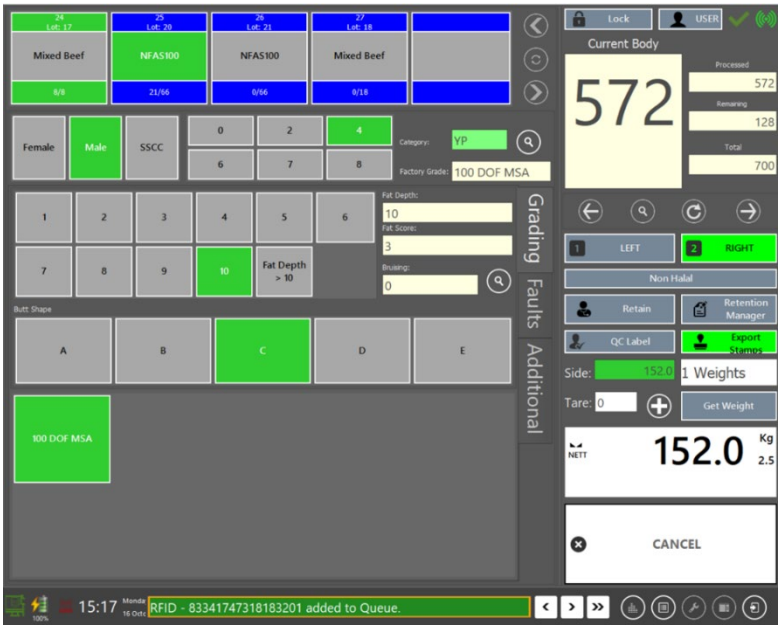

Figure 1: An example of a carcase side with assigned RFID number on the bottom of the screen

The chiller and planning team create a boning room run plan and pre-allocate rails within the sort chiller for each boning group within EMYDEX. EMYDEX and the sort chiller programming then directs sides onto different rails within the sort chiller depending on grade information.

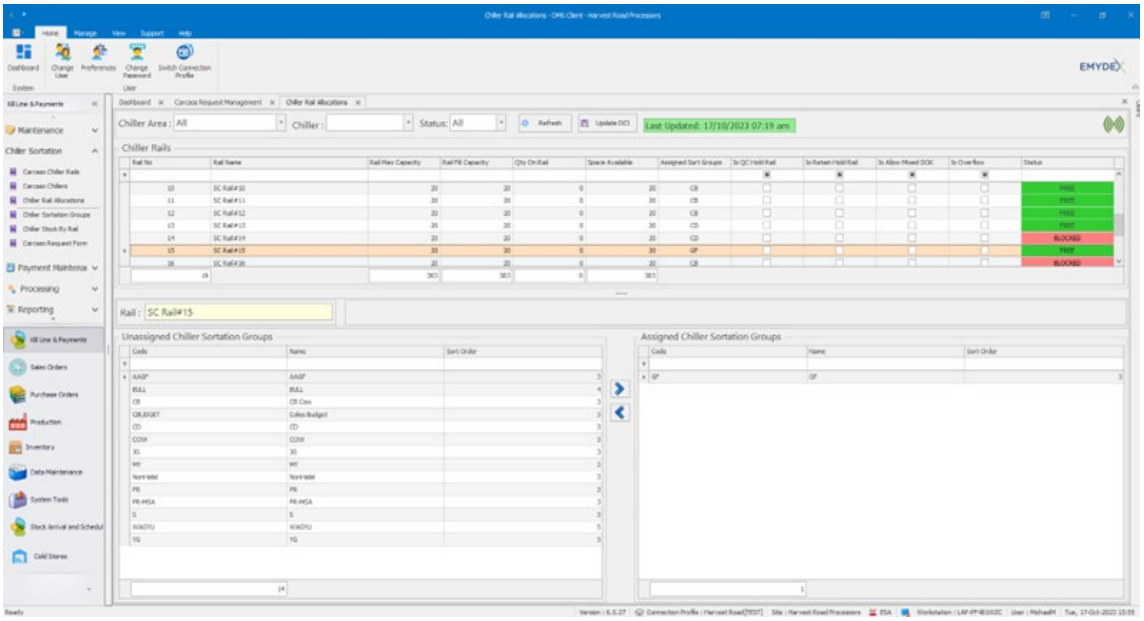

Figure 2: Sort Chiller rail allocation grades

As carcases are pulled automatically from their assigned sort chiller rails they are scanned at the boning room intake (BRI) computer. Once boning is completed the RFID hook is reset and recirculated into the system for assigning to the next carcase.

Project outcome

The sort chiller has been successful, though not without challenges. There has been great benefit in having the additional rails and configuration of the sort chiller. There has been a reduction in production errors where the wrong carcase type is pushed into the boning room causing a potential downgrade of all product from that carcase. The sort chiller has improved the efficiency of the carcase inventory system and ability for visibility of all stock by the production planning team. The sort chiller has provided increased holding capacity by 437 sides and has almost doubled the infeed capacity to chillers. There has been a reduction in labour units required, and injuries caused by manually moving heavy carcases. The sort chiller is also easy to clean and is not maintenance heavy.

The initial project was delayed by 18months majorly due to disruptions to construction caused by Covid-19. The sortation chiller was running for only a few months prior to another chiller becoming offline and resulting in the sort chiller being turned back to manual mode to accommodate the additional chiller space needed. Thus the Final Report for this project is based on only a few months of full operation. The offline carcase chiller is expected to be back online late 2024, at which time the sortation chiller will be switched back on. Harvey Beef will be providing an update on outcomes from this project and the fully functional sort chiller including production efficiencies, production error, labour and injury minimisation in 2025.

Benefit for industry

For processors investigating opportunities for implementation of an automated sortation chiller consider the following. How complex are your sorting needs? Do you need to be sorting multiple carcase types/categories prior to entry into the boning room.

Simple Marshalling Area: this would be enough for processors who don't have many cattle types or grades and require minimal sorting before sending carcases into the boning room and full automation may not be necessary, just some automation in push/pull to reduce manual handling

Automated Sortation Chiller: recommended for processors that need to sort a lot of cattle based on various factors, prior to entry into the boning room and don't have the capability to slightly sort straight from the slaughter floor into chillers, either due to lack of chiller space or smaller lot numbers affecting kill order of each cattle grade being processed.

Benefits of the sortation chiller as identified in the Final Report include improved efficiency with automation saving time and labour compared to manual, increased accuracy reducing the chance of human error in sorting cattle, better organisation allowing for precise sorting based on pre-defined criteria and ability to meet production demands and schedules, ability to target niche customer orders by weight ranging bodies and sorting with minimal human assumptions, potential to reduce injuries through manual labour reduction and risk of dropped carcases, potential to optimise yield and traceability due to sorting into efficient boning runs and not just on chiller grade of chiller capacity.