

PROJECT TITLE

Scoping processor and change management requirements in beef cutting control, yield data traceability, robotics, automation and structured manual cutting and handling.

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Project Description

The project has considered and applied change management as a discipline for transitions in the adoption of automation that can accomplish sustainable benefits in Australian beef processing. The focus has scoped processor requirements in beef cutting control, yield, traceability, robotics, automation and structured manual cutting and handling. Observations of major beef plants has been made and consultations held with senior leaders of beef operations.

The work has included consideration of the following: -

- Scope and benchmarking
- Cutting control and yield
- Automation and robotics
- IT and traceability requirements
- Skills requirements
- Space requirements
- Implementation methodology and process
- Change process management
- Infrastructure changes: space, training, etc.
- Framework for adoption, current & future solutions
- Mapping processor needs to supply capability
- Change management capacity

Project Content

Automation of beef processing tasks offers benefit in quality, yield, safety, hygiene as well as efficiency. The manual tasks that have been observed include those in slaughtering, cutting and end of line operations. Automation solutions are already in use in certain plants, particularly for end-of-line palletising. Figure 1 gives a summary of the priority opportunities in the beef cutting. Time to adoption is presented based on consultation with technology providers: short term being 1-2 years, medium term, 2-4 years, and long term 4-6 years or beyond.

AMPC 2019-1112			S= Scott Tech	AMPC-BMC Confidential - Australian Beef industry opportunities and management of change	Based on	Other
H-high	L- long	J= Jarvis	60 h/h		H- Hygiene	
M- medium	M- Medium	F= Frontmatec	Potential		Q- Quality	
L - Low	S-short	M= Marel	staff		Y- Yield	
Priority	Timeline	Supply	PRIORITIES FOR AUTOMATION		saving	S- Safety
H	S-M	S, Other	Pre-cutting and scribing		2-3	Y, S, Q
H	L	R&D	Primal piece separation		8-10	Y, Q
H	M-L	Other, R&D	Chine cutting		4-8	Y, Q, S
H	M	Other	Rib bone separation		2-6	Y, Q, S
H	M	R&D	Button bone and flat bone separation		4-8	Y, Q, S
L	L	R&D	Shank boning		4-6	Y
L	L	R&D	Neck boning		4-6	Y
H	M	R&D	Leg boning (front and back)		4-8	Y, Q
M	M	R&D	Rib cage de-boning		2-4	Y
H	M	Other, R&D	Striploin fat trimming for uniform fat cover		4-8	Y, Q

Figure 1: Priority automation opportunities in beef processing.

Supplier engagement and the management process towards adoption are important considerations.

The significance of senior management involvement is highlighted, especially in the definition and the processes of change as a first step, followed by the effort to establish infrastructure, including decision steps for the provision of space, services, staffing, training and management resources.

Implementation in all cases requires careful detailed planning with risk minimisation at every step, including in the processes of requirements definition, technology evaluation, and procurement to the point of adoption. The overview of Figure 2 shows typical steps as a guideline that may be followed, in the 'spiral of progress' for a given organisation to start and focus attention towards adoption.



Figure 2: 'spiral of progress' in the management of change from start to adoption.

Project Outcome

Management of change for effective and sustainable adoption of technology for beef processing from slaughtering to end of packing requires instigation and motivation at the most senior levels of a company. Figure 3 gives an overview of the change process with the focus on the beef industry interests in Australia to adopt automation in the cutting rooms with the objective to reach improved safety, yield, efficiency and quality. Formation of a project team to review, drive and procure robotics and automation is important in the execution of implementation (see Figure 3). Provision of space and consideration of human resource against specific solutions is necessary regardless of the status (readiness for use) of technology being adopted.

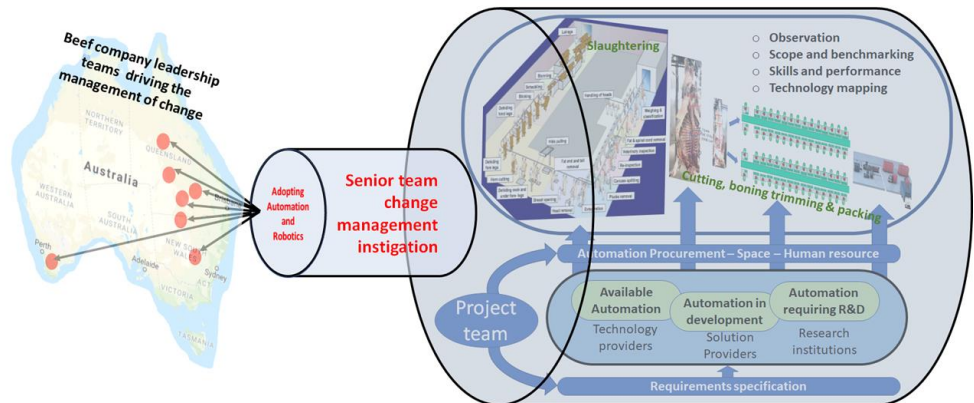


Figure 3: Management of change delivering robotics and automation

The cutting room, in most if not all plants in Australia, is where the physical correspondence is lost between each piece of meat, its source and data relating to its characteristic or processing. This is because of the absence of step-by-step tracking of both product movement and information associated with the task (Figure 4).

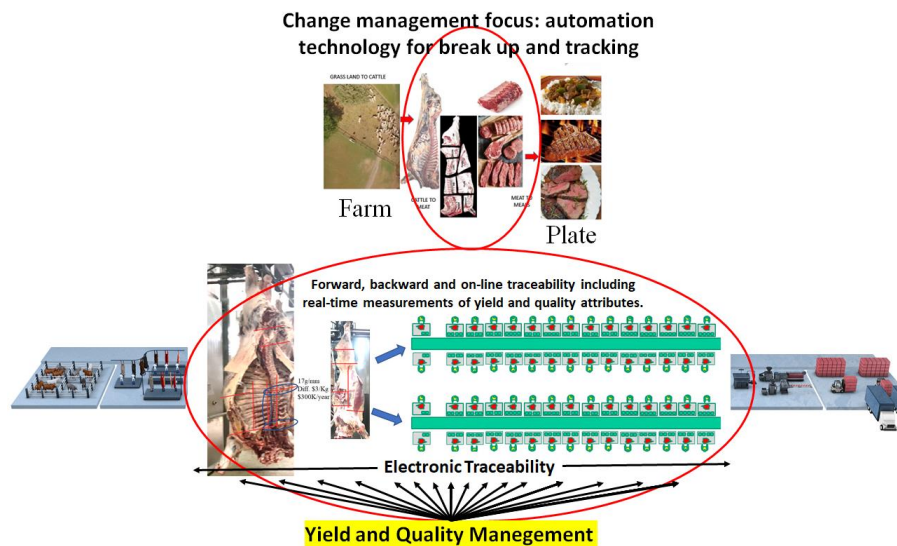


Figure 4: Break up and cutting room automation need to include traceability (Acknowledgements to Marel and Teys Australia).

The technologies to reach information connectivity along the supply and processing stages of a plant has been possible for many years and may be adopted. To accomplish the adoption, instigation of change management and the the formal documenting of the requirements are essential, facilitating the engagement of solution providers.

There are opportunities to extend the capabilities to include quality measurements and tracking, post breakup, in the cutting area including the following attributes:

- Fat, lean bone weight ratios
- Water binding capacity
- Tenderness

- Taste and Smell
- Colour
- Other meat quality attributes relevant to the consumer, e.g. fat cover after slicing.

Requirements for quality information have been of interest and high priority to the industry. The following technological barriers remain:

- Unavailability of on-line measurements (or the mechanism for their use) for several of the attributes of interest such as tenderness or taste or eating quality,
- Lack of value proposition data that justifies investment in both the technology and the traceability infrastructure that provides for the capability for using the data for day to day optimisation,
- Last, but not least, the commitment to the management of change that delivers the process specification to include the requirements for the inclusion of the quality measurement capabilities as enhancements to existing or an integral part of future production lines.

Benefit for Industry and recommendations

The decisions by a plant to apply the latest technology within a meat processing plant must consider management approach as well as change implementation, including the need for new skills, and development of current, or new space for automation.

Industry focus on automation and robotics is an important step for Australia to reduce cost delivering the highest quality beef to the world competitively.

There are also important R&D opportunities implementing on-line sensory capabilities and systems of data collection to provide quality information along the supply chain from the point of breeding to the point of consumption. Implementation of electronic data collection in a traceable manner can provide new grounds for value estimation. Optimisation of value is an important subject yet to be explored, specified, researched and introduced through the processes of change management

The formal management of change (<http://www.changeenablement.com.au/what-is-change-management/>) can be instrumental in the pathways to adoption and exploitation of R&D. Infrastructure developments support the sustainable use of automation in the beef sector.

The most critical barrier relates to shortfalls in skills as well as technical and managerial capacity within the sector. It is important to create mechanisms for steering and managing the processes that support long term solutions as well as human resource development, removing barriers and establishing longevity in outcomes. To this end, the following is recommended:

- Creation of industry led national steering group (NSG) combining the representation and interests of all stakeholders and developers, considering the value proposition to the sector and instigating change to drive forward the widespread adoption of robotics and advanced automation.
- Formation of a combined user industry, education and research community leadership group, supporting the NSG, to instigate new automation R&D and

educational developments, planning and delivering on priorities.

- Establishing industrial facilities for first implementation of new automation technology, for the evaluation of performance, staff training in management, operations and maintenance.
- Establishing a centre of excellence in meat automation in support of research, development, feasibility evaluation and training covering apprentice, undergraduate, graduate and industry continuing education. The initiative needs to focus on a new infrastructure for execution of R&D and engagement of young talent to meet the expectations of beef sector initially.
- Establishment of facilities that provide for first installation of robotic technologies within Australian plants, with the engagement of systems integration or engineering companies with expertise in robotics.