HIGH-TECH BEEF

A push to embrace new technology and harness big data is driving efficiency across the Aussie beef industry.

STORY **NATHAN DYER**

In the rib-cutting room at Australia's largest beef plant, a circular saw roars as it moves from one carcase to the next, making cut after precise cut. What makes this boning room unique is a robotic arm that guides the saw by analysing data collected from a mixture of high-tech x-ray and visual sensors.

According to Meat and Livestock Australia's (MLA) Sean Starling, the rib-cutting robot at JBS Australia's Dinmore facility near Ipswich, Qld – which uses objective carcase measurement technology known as Dual-Energy X-Ray Absorptiometry (DEXA) – is one of the most exciting examples of how the Aussie beef industry is embracing new technologies like never before. Developed by Scott Automation and Robotics, the robot uses a combination of DEXA, colour camera and 3D imagery to analyse complex meat, fat and bone data to determine correct cut coordinates.

"At the moment we've got a perfect storm of technologies coming to fruition at once, and an industry wanting to evolve and adopt those technologies," says Sean, explaining how the rib-cutting technology is an extension of automation already proven in the lamb-meat industry, but until now unable to be adapted to beef.

"With the rib-cutting machine, for example, you've got a journey that really started about 15 years ago, but has come to head just now because we've got lamb-proven, dual-energy x-ray technology so we can see what we need to see in beef, producers wanting meat-fat-bone feedback and companies like JBS who really want to keep looking at how to make their boning rooms more efficient."

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Automation in beef processing plants, such as at Oakey Beef in the Darling Downs, has the potential to significantly increase efficiency and health and safety.

SCOTT AUTOMATION AND ROBOTICS

Robots, like this rib-cutting machine engineered by Scott Automation and Robotics,
use complex meat, bone and fat data to determine correct cut coordinates.

NATHAN DYER

MLA

Talking as he drives between Melbourne and Warrnambool, the general manager of research, development and innovation at MLA says that with developments from robots in boning rooms to the possibility of microwave treatment of sick animals, the Aussie beef industry is working to close the technology gap between it and other meat industries. "Beef is a different animal to lamb and poultry and pork – it's worth more on a per head basis and so if you get automation wrong it costs you a lot more," Sean says. "The flip side is, if you get it right there's more money to be made."

Although still in its early stages, preliminary results suggest DEXA-enabled automation could increase beef-processing yields in excess of $15 per carcase. MLA has now presented to industry a plan to roll out the objective carcase measurement technology in up to 90 AUS-MEAT-accredited plants, at a cost of $150 million. Although a decision on the rollout is not expected until the end of March, Sean says wide-scale adoption is critical to getting the most out of new technologies.

Other technologies on the horizon include 3D printing of food with beef as an ingredient and advanced aerial tracking technology that has the potential to allow farmers to move from herd management to individual animal management.

Underpinning many of the most exciting new technologies is data, more specifically "big data"; huge amounts of information gathered, often over decades, and often underutilised. Chief executive of the newly created Integrity and Information Systems Company, Jane Weatherley, says making better use of big data is another critical step in the Aussie beef industry's high-tech evolution.

Although Australia is already a world leader in big data application, most notably through the National Livestock Identification System (NLIS) that tracks animal movements throughout the entire beef-supply chain, Jane says the industry is now embarking on a plan to make that data more assessible and powerful than ever.

Under MLA's Value Chain Digital Strategy, Jane is leading a team developing an open data platform to link NLIS information with new and existing information, including genetics, eating quality and objective carcase measurement data.

By enabling producers to better understand the relationship between eating quality and lean meat yield, and linking that to genetics, Jane says farmers will have new tools to make better data-based breeding decisions. "For example, a producer could ask, 'Are we going too hard on lean meat yield, and therefore do I need to select a different type of bull next time around?'"

While there is a lot of work to be done to make that possible, NLIS, which last year recorded more than 26 million unique animal movements, is a shining example of what the industry can achieve. "The implementation

ABOVE: CEO of Integrity Information Systems Company, Jane Weatherley, talks with pastoralist Steve Binnie at Maeranie Station near Singleton, NSW.
TOP: Monitoring the health and wellbeing of animals in feedlots could be advanced by aerial tracking technology.

CATTLE COUNCIL OF AUSTRALIA

Central Queensland cattleman David Hill on his Clarkwood property, near Marlborough.

of NLIS was a massive shift for industry and it caused a lot of angst," says Jane, referring to the system's 1999 introduction. "But the integrity and traceability systems it underpins are now worth an estimated $355 million to the industry."

Although experience and intuition will always be critical to successful farming, Jane says new technology has the potential to complement those aspects like never before. "If we have detailed data on individual animals and we can track them from birth right through to the consumer and the consumer's plate, then we will be in a far stronger position in terms of our ability to respond to customers' needs than we ever have been," she says.

Central Queensland cattle producer and Cattle Council of Australia director David Hill says staying ahead of the quality curve is the key to the industry's long-term viability. "Australian beef is highly regarded, but it's not cheap," says David, speaking from his property Clarkwood, about 80 kilometres north-west of Marlborough. "Our costs mean that we can't chase markets on a price point, so quality is our key point of entry."

By making better use of big data, David says Australian producers can get paid more fairly for what they actually produce. "At the moment, there's a lot subjectivity with what we do in this industry and I'm looking for objectivity," David says. "Objectivity gives you the proper price signals.

"What we've currently got is an averaging pricing system, so if there's a deviation from the mean, the actual value of the carcase could be $300 either side of that," David says. "Anything we can do to add to the objective nature of the pricing system, if it's got integrity and you get paid based on the actual value of the animal, and you put the proper tools in front of producers, well that's got to be good for the industry."

David says perhaps the biggest advantage of well-linked big data would be the ability to drill down into the specific traits of individual animals. While productivity – producing more kilograms per animal – has long been a key driver for producers, David says new tools have the potential to allow farmers to make decisions that better suit their individual properties.

"In areas like ours where climate variability is greater, for example, feed efficiency is one thing that I consider to be highly important," he says. "For me, those feed efficient animals will keep ticking along, whereas the high-growth animals have a high level of maintenance and start to peak and trough, but a producer in southern Victoria, for example, who has plenty of feed, might want a high-growth animal."

David says the industry is on the cusp of some big changes. "And that's the most exciting thing about where we are in our industry. We've already got a lot of quality, but with a bit of tweaking here and there we can take our product into the next quality tier."