Snapshot Report

AUSTRALIAN MEAT PROCESSOR CORPORATION

Carcase Marking

Carcase Marking Stage 2 – On Plant Proof of Application
(Lamb) Under Provider Supervision

Project Code	Prepared by		Date Submitted
2021-1083	Scott Technology		28/02/2023

Project Description

This project was a "proof of application" demonstration of carcase marking which utilised dual energy x-ray absorptiometry (DEXA) to derive cut positions, which were then marked on the visible external surface of a lamb carcase. The project utilised an existing processor host site hot-side DEXA Objective Carcase Measurement (OCM) machine to demonstrate and validate the feasibility of carcase marking in a processing environment using machine vision identified cut lines.

The project implemented additional hardware that was required to extract carcase bone-in primal cut lines based on anatomically defined AUSMeat cut specifications and coupled this with an "automatic" spray marking system that was temporarily installed at the processor's site and fit for the purpose of demonstrating the spray application.

Project Content

An automated marking apparatus was designed and built by Scott Technology which consisted of a two-axis manipulator with spray head and food-safe ink. This system was designed to be easily and temporarily integrated into the existing installation to allow quick installation and removal following the carcase marking trials.

Additional x-ray hardware was installed and commissioned on site to allow for the calculations of cut positions while not impacting the current DEXA OCM results. PLC code was also written to allow the system to send cut results from the DEXA derived analysis to the marking apparatus.

Once installed at the host processor's site, a trial was conducted where carcases were x-rayed by the Scott system, their cut positions calculated, and these cut positions were then sprayed onto the exterior surface of the carcases with the automated marking apparatus.

Project Outcome

This project confirmed that DEXA derived cut positions can be successfully sprayed onto the visible external surface of lamb carcases by an automated applicator at the desired heights and angles. The MEFE Halal Food Grade ink worked well when sprayed and was unable to be rubbed off immediately after application on hot lamb carcases.

After application the marked carcases were chilled in preparation for further processing. Once chilled the cut lines were able to be re-sighted and the cut lines used by a bandsaw operator to perform the indicated forequarter separation cut as established by Scott DEXA system.

As intended, several key learnings were gained on the setup, hardware, and implementation of a lamb carcase marking system which would improve future results. Additionally, as the marks were applied prior to rigor mortis and then measured post-rigor data was gained on the movement of cut markers during chilling and rigor.

Benefit for Industry

The technology of carcase marking on a hot carcase enables the DEXA system to be used both for Objective Carcase Measurement and primal cutting position identification and marking. This has several potential flow-on benefits:

Assist manual cut positioning

A processor may be able to implement carcase marking to provide a more accurate cutting position and faster identification of the cutting line within the boning room.

Develop automated marker detection and cutting

It may be possible to develop a simpler vision system within the boning room to locate the cutting position, or further work may identify a predictor of post-chilling location of cut lines, thus reducing the benefit of having an x-ray unit within the boning room, thereby reducing the cost and space requirements.

Additional OCM data

Primal cutting locations not previously measured prior to chilling can potentially be factored into OCM.

Allow staged capital expenditure

The benefits above enable a staged capital expenditure approach, and/or open the door to x-ray-guided cutting location for (typically smaller) processors who struggle to justify the price of a full X-Ray / Primal system.

Useful resources

Please refer to Scott/MLA project P.PSH.1200 for details on stage 1 carcase marking initial investigation
https://www.mla.com.au/research-and-development/reports/2020/leap-4-beef-cut-information-translation/