

Fingerprinting

Digital fingerprinting for primals back to carcasses

Project code
2024-1074

Prepared by
FloVision Solutions

Date submitted
21/06/24

Disclaimer The information contained within this publication has been prepared by a third party commissioned by Australian Meat Processor Corporation Ltd (AMPC). It does not necessarily reflect the opinion or position of AMPC. Care is taken to ensure the accuracy of the information contained in this publication. However, AMPC cannot accept responsibility for the accuracy or completeness of the information or opinions contained in this publication, nor does it endorse or adopt the information contained in this report.

No part of this work may be reproduced, copied, published, communicated or adapted in any form or by any means (electronic or otherwise) without the express written permission of Australian Meat Processor Corporation Ltd. All rights are expressly reserved. Requests for further authorisation should be directed to the CEO, AMPC, Northpoint Tower, Suite 1, Level 29, 100 Miller Street North Sydney NSW.

Project description

This project's intent is to perform initial beef validation on a AI solution that would allow for beef primals to be tracked by Carcass ID, without cumbersome changes to production environments. Traceability after carcass breakdown is a key industry need. Currently, once a carcass is broken down beyond quarters it is not practical to track and trace pieces, as this would require physical labels on every piece, which adds substantial complexity to systems, along with foreign body and quality concerns.

Project content

This project intends to prove the core technology associated with a solution to this traceability problem, developed by FloVision Solutions. This solution is referred to as "Fingerprinting", where a unique "fingerprint" of each object can be scanned and matched together, analogous to human fingerprint analysis or facial recognition. This project will focus on Striploin primals and ensuring they can be traced from quarter, when a physical label is still present and could be read, to post trimming, when the primal is about to be packaged and a label could easily be printed for further traceability.

5 batches of data were gathered across 3 production days. A variety of data augmentations and algorithm iterations were tested to optimize the Fingerprinting solution. Following these, all the data was processed and the Fingerprinting AI ran an exhaustive matching process, attempting to match every DC1 (Data Collection Point 1) image with every DC2 (Data Collection Point 2) image for that batch. DC1 was located before the chiller, when the meat is in quarters. DC2 was located between striploin trimming and packing. A total of 66,366 unique pairs of images were gathered to be assessed.

Project outcome

5 batches of striploin data were analysed. Batch information is shown in the below table.

| Batch | DC1 Images | DC2 Images | Total Number of Pairs | Positive Pairs | False Positives | Missed Pairs |
|---------|------------|------------|-----------------------|----------------|-----------------|--------------|
| Batch A | 88 | 99 | 8,712 | 37 | 0 | ~0 |
| Batch B | 74 | 128 | 9,472 | 30 | 0 | ~0 |
| Batch C | 65 | 114 | 7,410 | 41 | 0 | ~0 |
| Batch D | 157 | 179 | 28,103 | 79 | 0 | ~0 |
| Batch E | 103 | 123 | 12,669 | 15 | 0 | ~0 |

It can be concluded that the Fingerprinting test resulted in approximately 100% accuracy, certainly well above the targeted 95% outlined in the project objectives. There were 0% false positives, beating the 1% target outlined in the project objectives.

Benefit for industry

If a reliable solution can be validated that can trace primals back to their carcass, without substantial infrastructure and procedure change, this unlocks huge value in yield, genetics, quality control, recall efficiency, etc.