

ALM Tech News

No. 9



Meat for thought

Developing eating quality (EQ) measurement technology is a key objective in the ALM Tech project and the primary focus for Program 2. In addition to meeting planned Project milestones, ALM Tech researchers will provide research oversight for the new computed tomography (CT) project that was recently announced by MLA (see <https://www.mla.com.au/news-and-events/industry-news/eating-quality-objective-measurement-next-frontier/>).

This CT project will build on and contribute to research that was been done in the Project. It aims to develop hardware to measure eating quality and animal health attributes, as well as providing imagery for automation. The hardware combines existing robots with cone beam and flat panel CT technology, enabling a CT system to take 3D images of a large object. Importantly, the current 2D DEXA systems will position the robot scanner in the correct location for scanning of the mid-section of an animal or carcass.

At the Annual Review held in April, a proposal was approved to assess CT to predict intramuscular fat (IMF) percentage in lamb. IMF has a bearing on tenderness, flavour and juiciness of lamb and ideally should be in the range of 4-6%. To determine the desirable IMF percentage in lambs (with known IMF genetics) five muscles will be collected and CT scanned using various scan settings.

The findings of this experiment will add to previous research such as that done by Fiona Anderson and others. (For more information see: Anderson F, Pethick DW and Gardner GE (2015). The correlation of intramuscular fat content between muscles of the lamb carcass and the use of computed tomography to predict intramuscular fat percentage in lambs. *Animal* 9(7):1239-49).

Field days to inform the supply chain about DEXA were recently held in rural NSW and Queensland. These activities are important for the ALM Tech project to ensure that dialogue between all players is effective. It is anticipated that the newly formed Objective Carcass Measurement Adoption and Commercialisation Taskforce (OCMACT) will be instrumental in working with researchers in Program 5 to ensure this dialogue continues.

With regard to DEXA going forward, MLA is working through implementation details with leading global technology providers, and strategic industry processor partners. The OCMACT will review strategies prior to commercialisation being undertaken. ALM Tech researchers will provide scientific support in this process.

To date there is one lamb DEXA system operating in production and a beef DEXA system being installed.

If you have any questions or comments, please don't hesitate to contact me.

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Program E: Program Executive

Program leader: Graham Gardner

The Objective Carcass Measurement Adoption and Commercialisation Taskforce (OCMACT) met in July. On behalf of industry, this group will consider how best to adopt the technologies in question. With Graham part of this Taskforce, there will be a transparent pathway for the ALMTech Project researchers to provide the group with research validation for these technologies and systems for any associated data.

The first ALMTech Industry Calibration Workshop was also held in July. Discussion focussed on calibration and auditing requirements to enable delivery of new measurements/devices to industry. Progress was also made in identifying a preferred provider of the mobile CT DEXA calibration system.

Recent activities have highlighted the important connections between programs. As Operations Manager, Jaya Marimuthu will be working to ensure that communication within and between programs is effective.

P1: Development of Lean Meat Yield technology

Program leader: Graham Gardner

DEXA data was examined to quantify if measurement biases exist between different sexes or sire types. Results suggest that the supply chain should have confidence in the carcass information that can be generated from the DEXA system.

Of the 468 carcasses assessed (217 were female and 251 were male) fat % predicted by DEXA was similar to the fat % recorded by CT. A small bias (less than 0.5%) was found in the estimation of fat % by DEXA between the sexes. There was also a small bias (less than 0.75%) in the estimation of fat % by DEXA between the sire breeds.

These findings provide additional support to previous research in that the DEXA system is both precise and robust for predicting carcass fat. Maintaining accuracy over a variety of phenotypic variables including sex, and sire breed further adds to its validity.

P2: Development of eating quality (EQ) measurement technology

Program leaders: Dave Pethick & Pete McGilchrist

A meeting to discuss near-infrared spectroscopy (NIRS) progress for lamb meat quality grading and detection of boar taint was held in July. Based on the work completed to date it was concluded that NIRS has some potential for measuring IMF/pHu in lamb meat and boar taint in pork fat. Research in this area will continue in 2017/18.

Importantly, it was recognised at this meeting that close interaction with NIRS manufacturers is crucial for future research. Past research done with portable machines that were purpose designed for other functions (such as mineral detection for mining) are difficult to use. Machines that operate efficiently in this space are necessary if this technology is to progress further in this field.

P3: Development of robotic technology

Program leader: Christian Ruberg

The aim of this Program is to generate an automation prototype for beef processing. The focus to date has been on objective measurement developing an automated or assisted solution for beef carcass inspection or beef offal inspection.

MLA has recently announced that this research will receive a significant funding boost to fast track research supported by commercial co-investments via the MDC. In terms of the ALMTech project, the milestones that need to be achieved in this Program are still relevant.

By the end of the Project, a report will be written and will detail the development of prototype robotic sorting systems for offal or carcass down-grading, or condemnation being generated. Recent feasibility results come from investigation of MRI, airport baggage CT, and MEXA technology.

P4: Industry Databases

Program leader: Daniel Brown

The ALMTech is large research project with connections to various external projects. One of the objectives of Program 4 is to coordinate research opportunities so that data is produced efficiently.

To this end, Daniel is working closely with the Beef Information Nucleus (BIN) so that as many technologies as is physically possible can be involved in each relevant activity. The subsequent data can then be effectively utilised so that analyses are comprehensive and robust. Planning is underway for activities scheduled in early 2018.

P5: Data Decision Systems

Program leader: Wayne Pitchford

Working with the Lamb Supply Chain Group (LSCG) to provide feedback on a new version of the *Lamb Value Calculator* has been a recent priority.

Further work is progressing on developing a new supply chain officer position. It is expected that this person will use the calculator as a decision support tool for benchmarking, economic analysis, and scenario analysis. In addition, benefits from technologies proposed through the ALMTech Project can also be considered using this tool.