SNAPSHOT

CONTEMPORARY CHEMICAL LEAN VALIDATION – NATIONAL STANDARD FOR MEASUREMENT

Project Report Reference: 2017-1058   **Date: 1 March 2019**

Project Description

Chemical Lean (CL) is defined as the amount of lean red meat compared to the amount of fat in a meat sample. Its determination by an approved method is a mandatory AUS-MEAT requirement for any export meat product. Presently, there are fifteen approved methods ranging from classical wet chemical to specific instrumental based techniques. To date, no comprehensive study has been undertaken in Australia which compares contemporary methods used for CL determination. The project objectives were to engage with the Australian meat processing industry to identify currently used methods for CL determination, perform a method comparison, and develop a proposal for national standard for CL determination.

Project Content

The project presents a summary of an industry survey of contemporary CL practice. It also provides a set of CL results for a set of meats (consisting of beef of differing CL content, lamb and pork) measured with a range of methods, including chemical (Soxhlet fat extraction and microwave moisture) and instrumental (near infrared reflectance and transmittance, nuclear magnetic resonance and X-Ray) techniques. The results were compared using two metrics, normalised errors and robust z-scores.

Project Outcome

Engagement with Australian meat processors indicated that a number of methods are used for CL measurements in the industry, ranging from wet chemical to instrumental based techniques. Meat (consisting of beef, lamb and pork) was used in a method comparison that included Soxhlet fat extraction and microwave moisture analysis, along with a number of instrumental techniques; near infrared reflectance and transmittance, nuclear magnetic resonance and X-Ray. The method comparison, using normalised errors and robust z-scores, showed that the each method performed satisfactorily, and thus be regarded as 'fit-for-purpose' for CL determination in the Australian meat industry. Industry

engagement will be required to identify if a need exists for a national standard relating to contemporary CL determination.

Benefit for Industry
Overall, the comparison showed that each method used in the study performed satisfactorily, and was fit for its intended purpose. Suitable reference materials of assigned CL content would be of benefit to the industry. Future comparative studies would continue to monitor the on-going performance of contemporary CL methods deployed in the Australian meat industry.