Snapshot report

AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Heavy Metal Detection

Preliminary Investigation into the detection of heavy metal using Raman spectroscopy

Project code
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Project description

Current methods for monitoring heavy metal concentrations such as cadmium in livers are laboratory-based methods which are slow, resource-intensive and costly. Given the “chemical fingerprint” and sensitivity of Raman spectroscopy, this project investigated its potential to rapidly screen beef livers for the presence or absence of heavy metals and residues which would enable industry to safeguard their interests with robust and widespread assessment for heavy metals.

Project content

Raman spectra were taken on livers from 906 beef cattle including 174 livers from low-risk, 465 from medium risk 267 and from high-risk postcodes which are removed from the supply chain before livers were sampled for laboratory measurements.

Project outcome

Of the livers sampled, 114 livers from the high-risk samples and 26 of the livers sampled in the medium risk category had concentration of Cd concentration greater than 0.

Modelling was able to classify livers based on risk category but models to classify samples into low (0 – 0.1 mg/kg), medium (0.1 – 1 mg/kg) and high (>1mg/kg) groups based on their Cd concentrations was not possible as the incidence was too low.

Despite the low incidence of cadmium, some spectral differences were noted which may be related to the biochemical changes which occur when cadmium accumulates in livers.

Benefit for industry

Overall, this project suggests the incidence of cadmium in livers from cattle may be lower than previously reported with only 11% of livers yielding concentrations of cadmium above the limit of reporting (LOR).