SNAPSHOT

PREVENTION OF CONTAMINATION OF RENDERED MEAL AND TALLOW BY FOREIGN MATTER

Project Report Reference: 2018-1113 **Date: 6 November 2018**

Project Description

This project applied the "Hierarchy of Controls" to contamination of rendered meal and tallow to consider:

[1] Eliminate: Mandating removal of sources of contamination from the entire supply chain. This could be state or national based legislation, mandates or guidelines to prevent certain materials / devices from entering the supply chain. Examples include banning LDPE and LLDPE to prevent melting into tallow; making submissions of behalf of the industry to regulating bodies e.g. Food Safety Modernization Act (FSMA)[1]; improved segregation and waste practices so that contaminants are not present in rendering feedstock.

[2] Substituting: Substituting all current devices with renderable, non-contaminating and/or non-toxic materials. Options include protein (Novatein[2]), starch or plant based devices; National Livestock Identification System (NLIS) design specifications to help drive change in tagging products (e.g. magnetize for easier removal; ensuring high melting points of material). Adept Ltd (NZ) has had some success with starch and paper but has been unsuccessful with potato starch, TPS-Plantic, PLA, and biodegradable polyesters/starch blends as whilst being biodegradable, are not renderable. Adept's soluble devices are stated as being able to dissolve "inside the paunch (zero impact on paunch waste stream"[3].

[3] Redesign: Engineered controls: magnetic / metal detectors [400 kg metal per 400 t meal]; near infrared detectors [$0.75mil cap ex; 190 kg plastic removed per week out of 90-100 t meal per week]; magnetizing all tags and devices. With regards to the cost benefit of engineered solutions, a technical specification will be developed for short listed vendors with an associated cap ex, op ex and benefits analysis. The project team considered the size of operations and recommend the following scenario: "typical" beef processor of 156,250 head per annum (625 head per day, 2 shifts per day, 5 days per week, 50 weeks pa).

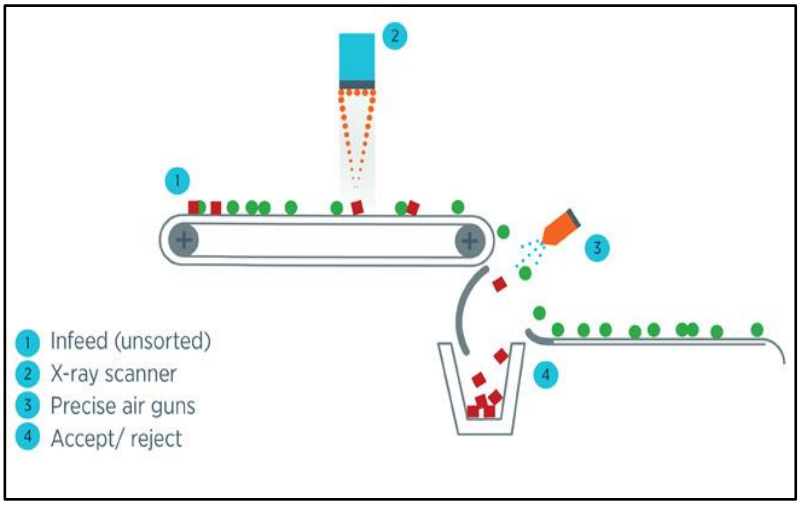
[4] Education / processes / administrative controls. Will be undertaken as part of this project.

[1] https://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm359436.htm
[2] http://www.adurobiopolymers.com/Novatein

Project Content

Automated detection and mechanical separation technologies considered included:

[1] Detection and removal: by material that has different density (X-ray) or light wavelength (near infra-red) e.g. plastics and metals



[2] Direct removal via magnets / electro-magnets: stainless, ferro, rocks

Alternative materials were considered. For example, a sheep plug made from red meat industry blood meal shown at ambient conditions (left) and after exposure to 160 ^{o}C heat. The plug did not melt; however, the device was highly brittle and dry.

Project Outcomes

A range of "off the shelf" devices are available that provide an "immediate" payback such as bungs and plugs plus also clips being in development. Protein base bio-polymers have a chemical composition and colour matching that or similar to that of meal. As a second option, polymer made

AUSTRALIAN MEAT PROCESSOR CORPORATION

from organic, soluble and renderable materials are available that is food safe and fit for animal consumption. Thirdly, bungs/plugs made from paper are available and can be processed through the rendering process however anecdotally can leave flecs and/or remain intact after rendering. Fourthly, materials that are sources of highest contamination risk (LLDPE and LDPE films that melt into tallow) can be replaced with polymers with high melting points (e.g. polypropylene). Including ferrous / metal material in devices was estimated to provide a 0.63 year payback for a typical beef operation and a 1.93 year payback for a sheep operation (i.e. abattoir with onsite rendering).

There is a strong economic argument for removing contaminants from the rendering feed as early as possible to protect equipment and to remove all contaminants (metals and plastics). Where a plant does not have an existing metal removal system, investing in a system to remove metal and magnetized devices can achieve a payback of 1 to 3 years. Automated detection and removal equipment utilizing near infra-red (NIR) can provide paybacks of 3 to 5 years. However, a NIR system can offer a higher net present value due to avoidance of metal and plastic contamination as well as showing utilization of best practice technology for dealing with a range of contaminants.

Benefit for Industry

Up to 45% of a slaughtered animal is processed by rendering, with rendered products (tallow and meal) contributing to around 8 – 10% of the revenue for a red meat processing facility with associated rendering. Hence for Australia's RMI to remain profitable it must be ensured that full revenues are obtained from rendered products.

Technically and financially viable options have been presented for eliminating, substituting, engineered solutions / redesigning systems and educating to assist in the prevention of contamination by foreign materials.

Industry wide data on rejection of material or claims for contamination are highly confidential, however anecdotal evidence suggests that the main sources of foreign material contamination to target for protein meal is coloured plastic and metal fragments whilst for tallow poly-ethylene (PE) is the main contaminant not listed in standard composition requirements.

USEFUL RESOURCES

2018-1113 Final Report

AUSTRALIAN MEAT PROCESSOR CORPORATION