# final report

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## Assessment of Co-Products Program

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# Abstract

The MLA co-product program seeks to improve the returns for co-products; protect market access for traditional uses of co-products and to develop alternative uses for co-products. Achievement of these objectives maintains the value of co-products relative to the total carcass worth.

A review of MLA co-products 58 projects was completed and then feedback obtained from industry stakeholders to assess the appropriateness of co-products program strategies.

Analysis of the projects and the stakeholder interviews has resulted in a number of recommendations for MLA assessment to improve the uptake of project work and future projects of interest to stakeholders.

# Executive summary

The MLA co-product program has the strategic objectives to improve the returns for co-products; protect market access for traditional uses of co-products and to develop alternative uses for co-products. Achievement of these objectives provides an end result of increasing the value derived by the red meat industry from co-products.

A review of MLA co-products funded projects has been undertaken. This detailed review of 58 projects has focused upon the areas:

- Project Goals
- Alignment of goals with MLA strategy
- Project report summary
- Achievement of project goals
- Project outcome recommendations.

Feedback has been obtained from industry stakeholders that have been used to assess the appropriateness of co-products program strategies to meet the requirements of the Australian meat industry and other stakeholders.

Targeted interviews were conducted with individuals with experience or knowledge in differing segments of the co-products supply chain. These interviews were undertaken to:

- Determination of the extent of uptake of project outputs.
- Identification of opportunities to accelerate and promote adoption of outputs.
- Provision of recommendations for strategies to encourage further adoption of project outputs.

The major recommendations provided from this report are listed below. More complete details relating to these recommendations are identified within the report.

**Communications & Strategy**

1. **Program Strategy** - MLA should retain its existing co-products program funding strategies. The policies in place are recognised by the majority of end users and there is solid support for these strategies.
2. **Final Reports** generated from R&D projects need to be made more readily accessible to industry stakeholders.
3. The **Partners in Innovation Program** offers capacity for MLA to gain greater funding leverage for project work by informing stakeholders of outcomes at the conclusion of relevant confidentiality expiry timelines.
4. A **communications plan** should be developed with a defined action plan for MLA to better communicate with co-products stakeholders.
5. **Co-products communication targets** need to be better defined. It is recommended that MLA review its existing contact register for all Co-products Program communications.
6. The use of **workshops** needs to be increased, with these being held in conjunction with industry associations.
7. **Consultation** is perceived as being inadequate by co-products stakeholders. MLA needs to adopt more widespread consultation in both project planning and review in order to foster commitment to outcomes.
8. **Industry Advocate -** MLA should appoint an informed and capable advocate to develop 2 way communications on all aspects of its Co-products Program.
9. **Industry Associations -** MLA should adopt a policy of participation (as a member or regular contributor) to stakeholder Associations. This also provides easy and managed access to a database of stakeholders. (see Appendix 4 for an initial list)
10. It is recommended that MLA compile co-products research outcomes information into a **Rendering Issues Manual**. The intent of the Rendering Issues Manual would be to

provide a concise document that defines projects completed by MLA and the outcomes which resulted.

11. **Meat Industry Service Contract** - it is recommended that MLA address the various communication issues identified in this report in the context of better defining the specific service role provided by Food Science Australia.

**Rendering**

12. **Processing technology –** this area should be left to industry to address and is not seen as a core funding area for MLA.
13. **Alternate Processing Technology –** MLA should continue to fund projects addressing the potential threat of SRM removal and disposal. Further work should be undertaken to validate the ADT technology in a scale-up plant.
14. **High Protein and Low Ash Meat Meal –** renderers need to be reminded of the market opportunities for the production of higher quality meat meal. This should be combined with provision of data from previous R&D projects which defined practical means by which renderers can produce such products.
15. **Business Management tools –** MLA should engage industry earlier in the project management process to ensure major stakeholder views relating to the potential technology uptake is well canvassed. The Benchmarking Rendering Model has a significantly divergent level of acceptance.
16. **Codes of Practice –** MLA should continue to fund R&D projects that address quality standards including work to clarify technical issues or better define minimum standards and procedures in the rendering industry.
17. **Microbial Presence –** MLA should continue to fund projects which foster continuous improvement in the area of salmonella and other microbial presence in co-products.
18. **Industry Partnership –** It is recommended that MLA continues to work with the ARA in fostering commitment from renderers for co-products R&D projects.
19. **Industry Practice Guidelines for Environmental Management –**the outcomes of this work need to be actively promoted to ensure all industry stakeholders are made aware that this resource material is available.
20. R&D work in the areas of **energy and water use efficiency** has been identified by stakeholders as new work areas for MLA review.
21. **Biogenic Amines –** There is no call for further work but previous recommendations need to be presented in a ready to use format.
22. **Tallow and biodiesel –** MLA should consider a project to define the potential impact biofuels production will have upon the rendering industry including co-products produced from the biodiesel process.
23. **SRM Removal and Disposal Contingency Planning –** MLA needs to better define how it can engage and communicate with abattoirs and renderers in relation to contingency planning for SRM removal and disposal.

**Aquaculture**

24. **Nutritional Research –** The nutritional work in replacing fish meal with meat meal has been practically done and MLA should not fund any further work addressing this issue.
25. **Market Evaluation –** MLA should revisit this work in providing to exporters a reminder of the market opportunity for meat meal to Asian aquaculture use.
26. **Higher Protein Meat Meal –** MLA needs to re-acquaint renderers and exporters with the aquaculture industries desire to access higher protein meat meal and their ability to pay higher prices for premium products.

**Petfood**

27. **Training -** MLA should prepare and implement a training system in offal processing procedures, hygiene and cleanliness with petfood company input to overcome barriers and foster change.
28. **Calcium and Phosphorus** - MLA should encourage industry, production of meat meal with reduced levels of ash and foster closer associations between supplier and customer in achieving this outcome.

29. **Innovation -** MLA should proactively seek partners and undertake product innovation projects which also protect the participants commercial position.
30. **Export** opportunities exist for petfood co-products, MLA should undertake generic marketing of the advantages of Australian meat industry petfood ingredients in target export markets.
31. **Nutraceuticals** are of topical interest to petfood manufacturers and MLA should ensure its current work is widely reported and outcomes available for implementation by petfood manufacturers.
32. **Industry Association -** MLA should continue to engage via the industry association through active participation of PFIAA.

**Stockfeed**

33. **Meat Meal Consistency –** Stockfeed manufacturers are reducing meat meal use due to its inconsistent nutritional value. MLA needs to promote the view that suppliers of meat meal must cater to the customer requirements to achieve the best value.
34. **Australian MBM Nutritional Guide –** not all exporters have seen this document and MLA needs to re-release this resource tool to industry to ensure widespread distribution.
35. MLA needs to more actively engage with the stockfeed industry to promote the research projects being undertaken in co-products. This should include **end users forums** convened in conjunction with ARA and potentially the Stock Feed Manufacturers' Council.
36. **Industry Association -** MLA should engage with the stockfeed industry via the industry association through active participation of SFMCA.

**Skins & Hides**

37. **Automated systems -** MLA should review with stakeholder's, options for development of automated systems for skin and hide processing and also review if simple training initiatives can be effectively implemented
38. **Quality interest and commercial benefit -** MLA should foster a closer relationship between local hide users and meat processors to define common goals and assist in identifying solutions of common commercial benefit.
39. **Environmental regulations** - MLA should work to provide responsible but workable environmental guidelines for processors to maintain the hide processing industry in Australia.
40. **Processing knowledge-** MLA should investigate opportunities to better process sheep skins as air drying is old technology and opportunities for improvement are not well known. Technology for treatment of high quality lamb and calf skins is also generally unknown.
41. **Stakeholder feedback-** MLA should ensure there is industry alignment and consensus by developing liaison with Australian Skins Hides and Leather Exporters Association and the domestic Leather Association.
42. **Skin/Hide Identification-** MLA should initiate a review of branding regulations now that the NLIS system is now in place. Stakeholders indicated that this single initiative would reduce downgraded hides significantly.

**Edible Offal**

43. **Existing prescriptive procedures** - MLA should undertake a review of processing standards which appear too prescriptive and need to be more outcome focused using a risk analysis approach.
44. **Align quality procedures with overseas market needs -** MLA needs to consider promoting a review of the regulatory system, including redefinition of the roles of various agencies to improve communications especially as these translate to the local processor level.
45. **Training** - MLA should update inspection training systems and technical knowledge so a common and appropriate approach exists between plants.

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# 1 Background

## 1.1 Key Strategic Issue

Since the inception of MLA in 1998, the Client and Innovation Service group has run a co-products program aimed at protecting and improving the value of co-products. The strategy of the co-products program has been modified over the last six years. There has been increasing emphasis on protecting Australian co-products in markets that may be reluctant to use co-products because of concerns about BSE and other diseases. The program has also developed emphasis on finding alternative uses for co-products in case some of the traditional uses are curtailed due to disease threats.

Co-product programs being developed for future implementation must build on the previous programs. To achieve this, MLA has sought a review of the strategies used in the previous programs and an assessment of project outputs. This review will enable MLA to ensure that previous completed projects have been implemented as far as possible.

By way of background, red meat co-products including edible offal contribute about $130 to $240 per head to the value of slaughtered cattle and about $10 to $15 per head to the value of sheep. The total value of co-products to the industry is about $1.7 billion per year. The mainstream co-products are edible offal, hides and skins, rendered co-products and pet food. The majority of co-products are rendered to produce meat meal, tallow and blood meal.

Some of the goals of the MLA co-product program have been to improve the returns for co-products; protect market access for traditional uses of co-products; and to develop alternative uses for co-products. To achieve these goals, MLA has conducted projects that have demonstrated the benefits of the use of meat and bone meal in aquaculture; improved the recovery rates of edible offal; produced a guide for the use of rendered products; supported workshops on the use of rendered product in China; investigated the biosecurity of heat treatments used in rendering; investigated options for the safe disposal of SRM; studied the feasibility of producing adhesives and biodegradable plastics from animal protein and hydroxyapatite from bone; and examined opportunities to expand the use of co-products in pet food.

## 1.2 Project Issues & Objectives

This project has a number of issues which have been addressed, including:

**1.** Examine the MLA co-products program plans since 1998 and collate the strategies that have been used to develop projects within the program;

**2.** Review the program strategies and comment on whether they have been appropriate to meet the requirements of the Australian meat industry and other stakeholders.

**3.** Review the projects that have been conducted as part of the co-products program since 1998 and collate the outputs of the projects. Projects that were conducted in the Meat Research Corporation co-products program before 1998 and which led into the MLA co-products program have been included in the review.

**4.** Assess how well the projects have matched the program strategies;

**5.** Determine the extent that outputs from projects have been taken up by the industry or other stakeholders;

**6.** Identify opportunities to accelerate or promote the adoption of outputs from projects and recommend strategies for encouraging adoption of project outputs.

## 1.3 Project Methodology

The Project was completed with a sequenced flow of work activities in a number of distinct steps, with resulting milestone achievements as identified below. There have been three major aspects to the work, these being:

- **Desktop Review**

Information supplied from MLA identified a listing of in excess of 137 funded projects. A number of these projects were not required to be reviewed as they were not projects that contained recommendations. The actual number of projects requiring detailed review was 58. These projects encompass the MLA co-products program plans since 1998 to present (but also included a few relevant earlier Meat Research Corporation reports).

MLA projects were divided according to the area of project work undertaken and each project review has focused upon the areas:

- Project Goals
- Alignment of goals with MLA strategy
- Project report summary
- Achievement of project goals
- Project outcome recommendations

A Milestone 3 Report has been written which provides greater review and analysis of each of the MLA projects reviewed.

The information gleaned from these reviews was used in preparing the questionnaires used in the stakeholders' interviews.

- **Stakeholder Interviews**

Interviews were undertaken with a range of stakeholders, including:

- MLA staff & advisors
- Meat industry participants – abattoirs and edible offal producers
- Renderers and users of meat meal, tallow and blood meal
- Hides & skins operators
- Pet food industry
- Relevant researchers and consultants

MLA Co-product projects cross a range of aspects from both a practical and technical perspective. As such not all projects were relevant to each and every stakeholder. This increased the need to conduct interviews with a broad range of participants to ensure the majority of projects are included within the interview process.

To foster success in this interview process, several interview questionnaires were formatted. Different questionnaires were used for each stakeholder sector. Stakeholder interviews were conducted in face to face meetings. A total of 48 questionnaires were completed across 19 different stakeholders.

# 2 Project Reviews

Commentary is provided relating to each of the major project review areas. This commentary is aimed at providing a summary of the major outcomes from the group of projects.

The assessment of the alignment of each projects' goals with MLA strategies is based upon the current MLA goals. The overall aim of the Co-products program is defined as being:

***Maintain the value of co-products relative to the total carcase worth.***

More detailed strategies are defined as:

- *Maintenance and protection of existing markets*
- *Development of alternate uses (incl moving products u[p the value chain)*
- *Communication with stakeholders*
- *Contingency planning if markets are lost*

It is recognised that the projects reviewed cover a ten year time period, during this time the MLA (MRC prior to 1998) strategy for co-products has shifted in emphasis. Rather than endeavouring to link each project's goals to the strategies in place at the point of time each project was approved, it was considered more appropriate to review projects based upon the current MLA co-products strategy.

## 2.1 Rendering

The area of rendering has been the most active in terms of MLA projects completed. As would be expected within the MLA strategy to maintain the contribution of co-products to the livestock value chain, work looking at the rendering process is central to the funding model.

There have been 16 projects reviewed, with these being primarily focused upon the process involved in the production of co-products. These projects have looked at either existing rendering processes or evaluation of alternate rendering such as the ADT process. The work undertaken meets the following MLA objectives[1]:

- Benchmark offal recovery
- Identify best-practice recovery systems
- Increase offal recovery
- Expand markets through product development

More recent projects have been completed in defending existing markets, this including projects looking at disposal of specific risk materials.

The work has lead to the introduction of Industries Codes of Practice and the Australian Standard for Rendering as well as Best Practice Guidelines for Environmental Management.

Additional projects have looked at the rendering process and its impact upon quality aspects of co-products produced such as salmonella, biogenic amines and bone ash content in MBM.

Feedback from renders has provided commentary relating to the processing work funded by MLA and views relating to the further funding of such work.

## 2.2 Aquaculture

Ten aquaculture projects have been reviewed including many which relate back to MRC instigation. All projects have a goal of developing access to a new and emerging market.

Initial investigations were undertaken by a number of contractors to demonstrate the use of meat meal as a substitute for fish meal, a commodity of increasing cost and reducing availability. Latter parts of the program involved demonstration of application of meat meal to different markets.

Many of the reports have identified the need for higher protein levels and reduced ash to stimulate buyer interest and increased substitution for fishmeal.

The level of application and production of meat meal more suited to this industry is reviewed in stakeholder interviews.

## 2.3 Petfood

Five Petfood projects have been assessed including an older MRC report dating to 1992. This project was largely superseded by the more recent report PRCOPIC.009 in 2004, although some of the recommendations not repeated in 2004 are worthy of review.

All projects are identified as either maintaining value or market access or in latter cases seeking value from new potential markets.

A recent project on Nutraceuticals has been assessed, but it is as yet incomplete.

A large number of recommendations have been documented and these have been reviewed by industry participants in stakeholder interviews.

## 2.4 Stockfeed

The four stockfeed related projects reviewed have all focused upon assessing the stockfeed markets requirements in terms of gaining feedback on the quality of meat meal and areas where meat meal could be improved for stockfeed use.

A project was undertaken to draw together all published data relating to Australian meat meal, with the end result being the publication of a nutritional dossier. This material has been made available to renderers to assist in the marketing of meat meal. The dossier was central to a number of marketing workshops held in China during 2005 to promote meat meal to the Chinese stockfeed industry.

Interviews with stockfeed industry representatives has provided feedback relating to whether the issues identified in MLA projects still exist and whether MLA has been successful in adding value to traditional rendered products.

## 2.5 Skins & Hides

Eight projects have been reviewed. Mostly the projects are based on a desire to improve quality and return to producers. An additional aim with some projects is to reduce environmental costs.

Older MRC hide projects are mostly based on identification to facilitate traceability and feedback to processors and producers. A significant benefit to the industry was identified in addressing quality improvement and payment mechanisms for desired quality characteristics rather than downgraded averages.

Work also on skins considers recovery and preservation of value. Most recently a survey of research resulted in publication of a series of brochures to assist processors.

### 2.6 Edible Offal

Included with the nine projects reviewed was an earlier MRC study from 1993. More lately projects have considered the opportunity to facilitate increased recovery to add value through the co-products value chain.

Market studies in China and Saudi Arabia have concluded that opportunity exists to expand trade if market criteria can be achieved. Some of the challenges involve significant change to inspection procedures and processes. The outcomes of these are further considered in stakeholder interviews.

### 2.7 Industrial

The projects reviewed have been limited to two studies looking at the potential for the supply of Hydroxyapatite (HAP) from hard bone which could have industrial applications as a chemical catalyst. The initial motivation for this work was due to calls for the production of low ash meat meal for aquaculture feeding and the problem of what could be done with the bone fractions left.

It is noted that the work to date has been based upon theoretical applications, no work has been completed assessing the practical or commercial applications.

### 2.8 Bioactives

This is a relatively new work area for MLA, and as such, the primary work projects have involved patent searches which have been aimed at defining potential market applications for co-products as a supply of bioactive materials.

Projects undertaken have been looking at extraction and use of collagen and fractionation of blood plasma.

These latter two areas were not subject to stakeholder reviews, being premature for stakeholders to be aware of their application.

It is note worthy to define the very positive approach MLA is taking in this research area, this leading to the establishment of a separate research program directed to development of bioactives from co-products. Whilst stakeholder interviews did not embrace the bioactives area, there was considerable positive feedback relating to the MLA initiative and the potential that this area of work provides to the red meat industry.

## 3 Stakeholder Feedback

Interviews were undertaken with a range of stakeholders within the co-products supply chain, these being identified within Appendix 3.

The interview process sought feedback relating to the appropriateness of program strategies to meet the requirements of the Australian meat industry and other stakeholders.

Targeted interviews were conducted with individuals with experience or knowledge in differing segments of the co-products supply chain. These interviews were undertaken for:

- Determination of the extent of uptake of project outputs,
- Identification of opportunities to accelerate and promote adoption of outputs.
- Provision of recommendations for strategies to encourage further adoption of project

## 3.1 Communications & Strategy

**Strategic Approach**

The most common feedback received during the interview process was lack of familiarity with the Co-products Program and its outputs. Comments included:

- *Little idea except through industry association contact*
- *Aware but not well acquainted*
- *Yes, but we are a larger plant, small plants really struggle to focus any attention*
- *We don't see many final reports, unsuccessful projects seem to get buried*

Indeed the lack of knowledge about MLA Co-Products projects amongst key stakeholders was surprising. Those that were aware of particular projects were mainly attuned because they attended a particular presentation, such as an ARA or PFIAA industry association meeting. In one case, although being a project contributor, one company did not receive the project feedback sent to others.

Due to the lack of familiarity with the co-products program, interviewees had variable capacity to define the strategic approach MLA employed in undertaking co-products R&D projects. Whilst some could clearly define the MLA strategy of programs being focussed on assisting the disposal of all meat products as high up the value chain as possible, others had little knowledge that a strategy existed.

Comments included:

- *Yes agree with this strategy*
- *Seems the most logical approach*
- *Everything from beef cattle slaughter has a value and the operator needs to get a return from each of these so the strategy meets our commercial goals*
- *Yes well aware of the strategy, but projects need to be practically and commercially feasible*
- *I fully agree with and support the focus on moving co-products up the value chain*

Relevance of the strategic approach sparked a variety of responses. The majority of those interviewed expressed a positive view regarding MLA's strategy of funding projects to maintain and protect existing markets, develop alternate uses, contingency planning if markets are lost and communication with stakeholders.

Some comments included:

- *Maintaining market access is an ongoing battle which MLA has an essential role in supporting through R&D.*
- *New applications are the most important*
- *More should be done with contingency planning - there was a BSE study but there is no industry action plan. Managers need to know how to deal with emergencies.*
- *Contingency planning is reactive and not communicated with stakeholders, we heard it on the news.*
- *Outcomes are not being delivered against strategic areas.*(ie unaware of completed works across all areas)
- *Disagree with development of alternative uses if development is not done in close co-operation with commercial companies.*

**Communications**

MLA project final reports are available from MLA on request. There is a lack of knowledge by stakeholders of what projects have been undertaken and what reports are available. There is a gap between MLA having final reports which can be provided to industry and industry knowing what reports are available! Stakeholders accessing MLA reports was found to be a rarity, with

a number of those interviewed expressing a desire to see final reports but not knowing the project had been finished, let alone a final report being accessible.

Fifth Quarter was known to many, but certainly not all. Few seemed to recall the most recent edition when prompted. Many seemed to feel the concept was ideal but it needed to be regular and preferably emailed to enable them to distribute easily to others who may have interest in particular aspects. Comments relating to the Fifth Quarter:

- *How can I get on the mailing list*
- *Someone else in our company must get this, I never see it*
- *I read every copy and it is a good information source, I keep them all on file*
- *Should be used to revisit older projects to remind us of what has been done*
- *I haven't seen a copy recently and not this latest one*

Workshops were recalled by several. They had positive views about them but unfortunately thought they were timed irregularly and infrequently. The joint MLA Petfood Workshop has been viewed favourably by the industry. This workshop strategy used for the petfood market could be employed in other domestic and export markets.

Almost all interviewees thought that MLA should be more active in promoting their work if they wanted industry input and acceptance. Some comments included:

- *MLA does a good job of the R&D but a poor job of marketing (with respect to co-products)*
- *Information may go to the company but we don't see it.*
- *We don't want to be burdened, so information needs to be "kept simple" and we can chase the details if needed*

How to better communicate was widely canvassed. Many had slightly differing ideas but the common elements seemed to be:

- Use the relevant industry association as the conduit, both for distribution of newsletters and publications and also by making regular appearances and presentations.
- Contact and commitment to relevant industry associations is essential. This includes not only ARA and PFIAA but other stakeholder associations for Hides/Skins, Leather, Stockfeed and others.
- Events require follow up and feedback.
- Use email as the preferred means for brief communications and regular updates.
- The need for a concerted and targeted marketing campaign to ensure multiple contacts within organisations.

Further suggestions included the desirability of creating a "face" for MLA who would represent at meetings, be available for consultation and provide follow up. Some typical comments included:

- *MLA should offer industry experts as a resource.*
- *MLA should consider a full time person to assist, promote access and act as a resource for stakeholders.*
- *Senior management are time poor so it is important to be persistent and ensure benefits are "sold".*
- *MLA need to market co-products just as they do red meat. (We think) MLA under spend on co-products compared to the contribution share of carcass value.*

The MLA website was discussed with varying comments. Many did not have the time (or inclination) to search for information unless they were aware of where to find the data. A suggestion was that Fifth Quarter might contain the abstract as well as the hyperlink to the website for the detail. There was some doubt as to whether all interviewed had the appropriate website access levels to find relevant reports.

**Consultation**

There were significant differences of opinion relating to the relevant level of consultation that MLA should undertake with stakeholders in defining co-products R&D project work. Larger meat companies stated they have a close linkage with MLA staff and believe they already have adequate opportunity to consult with MLA, thus influencing potential project work undertaken. Introduction of the Partners in Innovation Program has increased opportunity for these companies to work with MLA. Other stakeholders expressed the view that they see industry associations such as the ARA as being the preferred method by which they can be involved in consultation.

Retention of confidentiality is required within the conduct of PIP projects due to their commercial nature. Industry stakeholders are interested to accessing project outcome results after the expiry of any technology exclusion period. Interviewees have expressed a desire to hear about both positive and negative outcomes. The view being that finding out about failed projects are of value to other companies as it may well identify areas to avoid.

The general response is that there is insufficient consultation with industry when projects are completed. In many cases stakeholders are unaware that projects have been completed and question whether opportunities are being lost through a lack of feedback to relevant parts of the supply chain.

**Summary:**

- Generally there is a lack of familiarity with Co-products Program outputs.
- Good acceptance of the overall strategy of moving co-products up the value chain.
- The strategic approach is generally agreed but some aspects are under resourced or perhaps under communicated.
- Lack of awareness was surprising, seemed more by chance than design.
- Fifth Quarter is a known but seems poorly distributed to key co-products stakeholders.
- Workshops are a positive means of communicating; the frequency of workshop conduct could be increased for both domestic renderers and for end user markets.
- MLA needs to be more active in promoting its work
- An active marketing campaign using all stakeholder industry associations is desirable. Email can be used to facilitate widespread dissemination.
- Consider appointment of a “talking head” to represent MLA at industry level.
- Information needs to be readily available in summary form to market interest and further details on website if desired.
- MLA needs to communicate PIP project outcomes at the expiry of confidentiality exclusion periods.

## 3.2 Rendering

The rendering process is recognised as an area within which MLA has completed many R&D projects. There is, however, differing views relating to the success of the work and what projects should be undertaken in the future.

The completed project work looking at the ADT process is not well understood, with many stakeholders having little knowledge about the process. Use of this technology for general rendering is not viewed positively by renderers and there is a view that MLA should not be funding further work in this area. There is agreement that funding work to look at use of the ADT process technology for the potential rendering of SRM’s was a valuable project to prepare the industry for this potential scenario. Whilst pilot plant work has been undertaken, the technology needs to progress to scale-up testing to assess the technologies viability to degrade the BSE prion. This scale-up work needs to generate data to assess the processing economics relative to incineration as a disposal method. It is recognised that this work needs

to be addressed from a global perspective, with the technology having greater potential application in overseas markets where BSE is present.

There is little support for R&D projects which look at comparing different rendering systems. This is seen as being a commercial issue which individual companies should be addressing with equipment suppliers. There were strong views that the expertise available from equipment suppliers was improving, with access to international technology being readily available, although at a price. The larger rendering operators believe they have access to sufficient knowledge and resources to address issues relating to the actual process of converting wet raw materials into rendered products.

The MLA initiated directory of Australian renderers was well received and the transition to control of this directory by the ARA is seen as a positive industry outcome.

Whilst project work defining methods of separating bone from meat meal to produce a higher protein and low ash meat meal are well known, this work has had no impact upon the rendering industry. The major problem remains the disposal of the high ash bone fraction which has no ready market. It remains easier for renderers to operate using all raw materials to produce meat meal which is sold as is, rather than attempting to modify processing to produce meat meal which will obtain a premium price. This lack of motivation to produce higher protein meat meal then limits potential use by aquafeed, petfood and stockfeed manufacturers. Conversely the end users are not offering a sufficient financial incentive to renderers to warrant changes in their processing to produce higher quality meat meal.

The industry is conscious of the threat BSE presents to the Australian red meat industry. As such, there is overwhelming support for MLA project work which looks at issues such as SRM removal and disposal. Stakeholders are aware that MLA has been involved in work looking at contingency planning, and the confidentiality of this work is respected. There is a view that contingency planning needs to be extended to operating level, so that companies can assess their own level of preparedness should moves to remove SRM from meat meal intensify.

There has been considerable work undertaken in assessing the impact processing has upon nutritional quality of meat meal and blood meal. The view of renderers interviewed is that there does not need to be any further funding for such project work. This view is in contrast to that identified through interviews with stockfeed industry stakeholders (refer to stockfeed stakeholder feedback section). There remains a gap between the views of renderers supplying meat meal and the end users buying the product!

Microbial levels within rendered products remain a significant issue for the rendering industry. Feedback is that the industry has made significant progress through the introduction and adoption of the Australian Standard for Hygienic Rendering. Most stakeholders recognise that this standard evolved over time, having origins from MLA funded projects. There is recognition that continuous improvement needs to be made in this area to protect to continued sale outlets for rendered products.

There is little knowledge of the Salmonella Problem Solving Guide. This knowledge seems limited to those renderers who have been involved in the project work. Industry, when hearing about the guide, is in agreement that this is the type of work MLA should be involved in. Some stakeholders were critical of the time delay experienced in getting R&D project results out to industry. There is also a view that MLA should be more active in promoting work which is in progress, rather then industry not finding out what MLA is doing until after the work is complete.

Project work completed looking at Biogenic amines is seen as being required to be completed due to the global interest taken in this issue and concerns being raised by the stockfeed manufacturers. This is seen as a positive outcome as MLA was able to respond to the industry threat through completion of an analysis survey of meat meal in the market. Renderers do not believe any further work needs to be completed in this area.

Some interviewees see a role for MLA in providing the technical research to address questions relating to industry regulation. The example was given of the tight regulations over meat meal and blood meal use in pig and poultry feeding and potential tighter controls over SRM. Whilst individual renderers and the ARA have limited resources to address these issues, it was felt that MLA should be conducting greater work in these areas based upon risk analysis to define the minimal risk whilst Australia remains BSE free.

One of the most significant challenges being faced by the industry is environmental management; in particular effluent and odour control. Whilst some operators profess to have this area under control, all agree that the pressures of compliance will increase, particularly with increasing levels of urbanization around existing meat processing and rendering plants. The MLA initiative to develop the Industry Practice Guidelines for Environmental Management is seen as a very, very positive step forward. There are, however, stakeholders who have no knowledge of these guidelines, but have expressed a positive desire to access them when available.

The provision of an Excel spreadsheet model, resulting from the Benchmarking project, to assist renderers in defining their operating costs and offal recovery has a mixed level of response. The larger abattoirs operating rendering plants see little value in this work being funded by MLA. This view is based upon their existing in-house financial and operating controls which allow them to manage this part of their business. These companies view this as their commercial advantage and question why MLA should be involved in the provision of what they see as business management tools to industry. The converse opinion was received from other operators who can see value in using a spreadsheet model to better define their rendering operations. These companies would access the model to see what benefit it could add to their business.

During the project review stage of this project it was recognised that MLA has not funded R&D work on tallow for many years. In conducting interviews, there was found to be no support for any such project work. It was felt that all was known about tallow and that the traditional markets for tallow were in decline. The alternate use of tallow within biodiesel production is recognised as offering benefits to the industry. MLA work being conducted in the biofuels area is supported.

Whilst most stakeholders struggled to identify new area for R&D within rendering, a number did raise the issue of energy efficiency as the cost of energy sources increase. The benchmarking project work identified energy as the largest cost area within rendering. Further work could be undertaken to look at methods within which renderers could become more energy efficient, suggestions including use of heat exchangers.

Under a similar theme, it was identified that the offal areas within abattoirs is a large user of water. As well as being a waste of a valuable resource, this water needs to be treated and disposed off. Opportunity exists for R&D work to be completed looking at methods of reducing water usage through changed practices and water recycling. Current use of recycled water is restricted due to food safety controls. There would seem to be an area of work which MLA could further investigate.

There is a lack of knowledge about what project work MLA is undertaking. Stakeholders are asking for MLA to increase promotion of project work, both new projects as well as older projects. Initiatives such as the Salmonella Problem Solving Guide, Best Practice Guidelines for Environmental Management and Rendering Spreadsheet Model are all recognised as positive MLA projects which can have significant benefits for the industry. In addition a number of stakeholders interviewed recognised older projects they had either forgotten about or had never received further information. They have questioned why MLA does not take advantage of this R&D funding investment by revisiting these project results which can be communicated to industry.

**Summary:**

- The research components of projects are highly regarded by renderers.
- There is much good work completed over the last 10 years which should be revisited and provided to industry.
- Renderers support work which assists them in meeting compliance demands such as environment and food safety.
- There is no strong desire for MLA to fund projects looking at the physical rendering process. Work on equipment and rendering systems is seen as the responsibility of commercial companies.
- The only area of processing worthy of further consideration is handling and disposal of SRMs. This work should include scale-up testing of the ADT process and economics.
- Industry has a poor understanding of projects being undertaken by MLA. Companies involved in these projects have a better knowledge of what is being done, whilst others have little knowledge.
- Awareness of new MLA initiatives such as the Industry Practice Guidelines for Environmental Management and the Salmonella Problem Solving Guide is poor. These initiatives will be well received when made available.
- Renderers are not seeking to implement processing changes to improve the quality of meat meal. The emphasis is on processing raw materials as they are available, with the resulting meat meal sold as a commodity into the domestic and export markets.
- Further work in the areas of energy and water efficiency is identified as potential new areas of work.

## 3.3 Aquaculture

A limited number of interviews were completed with stakeholders working within the aquaculture industries. This feedback was combined with that obtained from companies supplying meat meal to the aquaculture industry.

The MLA funded work looking at the use of meat meal as a replacement for fish meal is recognised as being world class research. This work advanced the area of aquaculture nutrition and has resulted in global recognition for the research scientists involved. The feedback from two of the research scientists involved in this work has confirmed that there is little further work that should be conducted looking at meat meal as a replacement for fish meal in aquaculture. Their view being that there needs to be a “marketing promotion” to the aquaculture industry in Asia promoting meat meal use rather than further nutritional research work.

The one area of additional nutritional research work which would assist in better defining the value of meat meal for prawn feeding is the cholesterol supply from meat meal. Cholesterol is an expensive prawn feed additive and the better understanding of the cholesterol content of meat meal would increase the relative value of meat meal for this application.

It is recognised that the MLA project work completed looking at the use of meat meal in aquafeed has had little impact upon acceptance and use within the aquaculture industry in Australia or overseas. This poor outcome is attributed to the following:

- BSE and the negative image of meat meal
- The need for higher protein, lower ash meat meal
- Renderers not producing higher protein and low ash meat meal
- Influence of Europe in demanding aquaculture products are derived from fish species not fed meat meal
- Meat meal quality inconsistency relative to fish meal
- Availability of other alternate proteins such as dehulled lupins and soybean meal protein fractions.

- Limited knowledge, within the Asian aquaculture market, about the Australian research work completed.

The anecdotal evidence is that a portion of meat meal exported to Indonesia and Thailand, Malaysia and China is being used within aquaculture feeds. Meat meal in use is typical 50% protein meal with higher ash content. This use is based upon inclusion in lower value aquaculture species and limited inclusion rates to avoid excess phosphorus problems.

Use of meat meal in Australian aquafeed diets is limited to one of the two major aquafeed manufacturers, with this manufacturer being frustrated in not having capacity to source higher quality meat meal. Even with the offer of paying a premium price, there is a lack of willingness by renderers to meet this market demand. The volume involved remains relatively small, with renderers obviously not seeing enough incentive to modify their processing. The second aquafeed manufacturer is influenced through their European ownership structure which defines a policy of non meat meal use.

There is a view that there remains market opportunities within the Asian aquaculture industry to use meat meal which is better suited to aquaculture feeding. The negative view about meat meal is felt to be softening, and the promotion of meat meal coming from Australia as a BSE free country would offer opportunity for exports to these markets.

It was the view of some renderers that they need to be reminded about the aquaculture research work, as well as the market opportunities in Asian aquaculture feeding.

**Summary:**

- MLA's previous work has been sufficient to confirm that meat meal can be used in aquaculture diets. There is little call for further nutritional work.
- Uptake of the use of meat meal is limited by the lack of supply of high protein/low ash meat meal. Meat meal usage is occurring, albeit at lower usage rates and without a premium paid for products used.
- Renderers have not taken up the opportunity to produce and market meat meal better suited to aquaculture feeding.
- There is a need for greater marketing activity to promote to renderers and exporters the potential market opportunities that are being missed. This would need to be combined with end user promotions to re-enforce the value of higher protein and low ash meat meal use in aquaculture.
- Marketing to Asia needs to emphasise Australian meat meal as being supplied from a defined BSE free country.

## 3.4 Petfood

The 2004 review of the petfood industry was generally known, especially as MLA had arranged a seminar in conjunction with the PFIAA to present and explore the research.

Outcomes such as the need to reduce levels of contamination were understood by renderers, but it seems there has been little improvement in recent times. Petfood manufacturers regard providing clean and uncontaminated product as an expectation from their supplier. The comment was made that contaminants may affect end product palatability and is certainly a visual impediment to purchasers of petfood products. Consumers are becoming more discerning and trading up to perceived higher quality as the petfood market is shrinking in volume terms. Generally petfood manufacturers work closely with selected suppliers and if excessive contamination is found they "vote with their feet".

Petfood manufacturers are of the view that apathy exists in meat processing plants toward the quality and integrity of their product. They believe plant training relating to the importance of

quality to petfood manufacturers could assist. Rancidity was raised as an issue in preparing meals for use by petfood companies.

Plant volumes are thought to be a hindrance to smaller suppliers. Large petfood manufacturers have developed supply logistics which overcome volume issues, whilst it seems difficult for small operators to justify plant labour to collect these materials. There seems little proactive push from abattoirs to develop alternate products or supply to petfood customers; the expectation is for petfood manufacturers to provide the innovation.

The need to stain, inspect and discard some products is not a petfood industry requirement and seen as a negative in supporting their needs. This approach is not characterized in the chicken industry which is seen as being more inventive and flexible to petfood industry needs.

Export represents a significant opportunity for petfood particularly with Australia's position as being free of exotic diseases such as BSE. There are, however, consumer barriers to use of meat industry products in petfood in many of these countries. Some manufacturers have chosen to address this by excluding meat from petfood sent to these markets.

Use of meat meal in petfood is limited by calcium and phosphorus levels. More meat meal would be used in petfood products if lower ash levels were available at acceptable prices (for example, poultry meal and soybean meals which have higher protein and lower ash).

There is significant interest in neutraceuticals and therapeutics as market demands change. Some manufacturers seek to protect their market share by applying their own proprietary intellectual property and are wary about adopting technology which is available across their industry.

**Summary:**

- Quality is an expectation from petfood manufacturers whilst being an attitude not prevalent from co-product suppliers
- Plant training with emphasis on meeting customer quality expectations may assist in overcoming industry limitation
- A void exists between meat industry and petfood manufacturers attributed as a lack of interest
- Little proactive push relating to innovation on co-products being supplied to the petfood industry is evident from meat industry participants
- Export opportunities exist but consumers are being conditioned to believe use of meat industry co-products should be avoided
- High Ca/P and low protein limit the use of meat meal
- Innovations are sought by petfood companies but they desire exclusiveness to grow market share

## 3.5 Stockfeed

The view of stockfeed industry participants involved in interviews is that there has been no change in the issues relating to meat meal quality over the last 10-15 years. Previous MLA projects identified a declining level of use of meat meal within pig and poultry feeds in Australia. The greatest negative factor against meat meal use is product inconsistency between suppliers. This remains the major issue for the suppliers of meat meal, with feed manufacturers utilising higher levels of soybean meal, canola meal and synthetic amino acids at the expense of meat meal. Use of meat meal has been further hampered through the use of the enzyme phytase which increases phosphorus availability from plant sources and reduces the reliance upon meat meal as a source of phosphorus.

Stockfeed nutritionists expressed the view that they have come to live with the inconsistency in meat meal, with the specification downgraded to account for the lowest quality meat meal in

use. Although this is seen as inefficient when higher quality meat meal is used, it is the practical means by which they can guard against lower quality product when it is received.

Some stockfeed mills have formed close relationships with preferred meat meal suppliers, this involving higher price payment for product of higher quality. There are, however, other manufacturers buying on price, this allows suppliers of lower quality meat meal to gain market access, whilst at the same time sending the signal to renderers that price is more important than quality.

Whilst stockfeed mills have a limited understanding of the effect different processing conditions have upon meat meal quality, there is no strong view that MLA should be funding further work in this area. Some views expressed were that it was up to individual renderers to be more proactive in producing better quality and consistent meat meal if they are seeking to gain either higher prices or increased product usage within pig and poultry feeds.

There are mixed views relating to the progress being made by renderers in hygienic rendering. Some feed mills see positive steps being taken by renderers through accreditation to the Australian standard. Other meat meal users do not believe there has been any significant change in the level of salmonella positive samples of meat meal. Reducing the presence of salmonella in meat meal is still seen as a major issue for the industry.

Manufacturers of chicken meat feeds remain conscious of the presence of biogenic amines and question practices in the rendering of dead stock, particularly during summer months. The MLA R&D work is seen as a positive outcome in defining the level of biogenic amines present in meat meal.

**Summary:**

- Use of meat meal continues to decline as product inconsistency remains a major issue for stockfeed manufacturers.
- Renderers have little capacity to increase meat meal consistency as they are limited to the raw materials available for rendering.
- There is a stand-off between stockfeed end users and renderers which limits capacity to reverse the declining meat meal usage trend.
- Stockfeed end users are disjointed in the provision of market signals to meat meal suppliers. Some end users have formed close alliances with suppliers with preferred meat meal quality, whilst others only buy on price with less emphasis on quality.
- Improvements in meat meal quality, through changes in rendering processing, is seen as a site specific issue which needs to be addressed by each renderer. MLA has a role in defining the need for increased quality to satisfy end user market demand.
- There is little recognition from the stockfeed industry that progress has been made in relation to salmonella in meat meal. MLA needs to work with the ARA in promoting to the stockfeed industry the positive progress made in hygienic rendering through the introduction of the Australian Standard.

## 3.6 Skins & Hides

Much of the MLA work has centred on hide/skin ID to improve quality feedback to the processor and in turn the producer. There is a lack of supply chain integrity; where animals are purchased through sale yards there is no commercial benefit that can accrue to the producer that supplies animals with better quality skins or hides. Conversely, there is no practical method of penalising producers that have poor on farm practices which detract from hide and skin quality. For animals which are supplied directly to abattoirs or feedlots, most lots are small and irregular. Systems to feedback data relating to skin or hide quality do not exist and nor does there appear to be a strong commercial incentive for their development.

Further work on ID systems was suggested by one interviewee, such as indelible marks or tags which survive the tanning processes. It seems incongruous that producers who control ticks, carefully place any brands and generally handle cattle appropriately are not rewarded.

Whilst it would seem that opportunity exists to add value through increasing feedback to livestock producers, there have been negative views expressed relating to the practicality of tracking individual hides or skins through the processing chain. As there is some diversity of view about feedback to abattoirs and producers, it is suggested industry consultation and consensus should occur before any further studies or research.

Over 60% of the market is salted hides, China being the biggest market. There is no incentive from these markets to promote quality improvements. However for the local wet/blue processors, preservation techniques are important and can be promoted. This is particularly important in summer and is gaining interest. It, however, requires support from abattoirs that may not have facilities or labour to develop such endeavours.

Skin and hide damage is generally an issue within the industry exacerbated by the lack of trained staff for these roles. Labour availability in many plants is the major issue and the skin/hide removal area is often staffed by under-trained casuals. More automated systems may be a solution.

Reduction in the size of Bos Indicus “humps” by breeding may contribute to significant improvements in hide quality.

Water, salt and energy are huge issues for the hide industry in Australia. Salting of hides and export to China sends the problems (and value adding) elsewhere. Processors in Australia risk being regulated out of commercial survival and care is needed with appropriate treatment of environmental requirements. Such a trend is likely to depress value for Australian producers.

We were advised that the MLA market data reporting system had recently been reviewed to separate pricing information from different regions. As a result the data is much more useful as it separates differing regional characteristics and pricing. Comment was made that: it is a useful guide for the market.

The processing of skins (air drying) is generally viewed as old technology. If better technology is available it is generally unknown. Additionally, little seems to be known of the best methods for pre-processing high value skins such as calf or lamb.

There is some knowledge of Partners in Innovation Projects on skins having been completed, however the industry is generally unaware of the project outcomes.

Branding and tick damage are viewed as two major impacts on hide quality. The advent of NLIS should obviate the need for branding but requires changes to state legislation to accomplish. By not branding cattle, this would provide a significant increase to the value of cattle hides. Work on this and tick vaccines/management are suggested as being a focus for MLA research.

**Summary:**

- The lack of supply chain integrity and strong commercial incentive diminish the opportunity for quality improvement and returns.
- Producers who manage their disease, branding and handling better are not rewarded, this requires review to achieve industry consensus prior to further work.
- Labour availability at abattoirs limits skin and hide processing training, automated systems may provide a solution.
- It is easy to salt hides and sell to a trader who does not demand quality.
- Local processors are seeking quality, but difficult to gain abattoir interest.

- Environmental regulation may result in export of green hides (and the value). Better technology aligned to the industry is needed.
- Skin drying seems old technology, opportunities for improvement are not well known.
- Technology for treatment of high quality lamb and calf skins is generally not known.
- Industry feedback from Partners in Innovation Projects is sought (after exclusions are expired).
- Review of branding regulations is overdue particularly now that the NLIS system is in place. This is an area MLA should be actively seeking feedback and involvement with the beef industry.

## 3.7 Edible Offal

Interviews indicated that errors still occur in the inspection procedure resulting in less than desired offal recovery rates. Those interviewed feel that systems used by inspectors tend to be too prescriptive. The question about the practice of quality inspection was raised when an animal has already been passed as fit for human consumption. Perhaps a risk analysis approach should be considered as generally typifies the food industry. (Example was given that the chicken industry does not inspect its offals individually).

Tripe recovery may be considered un-economic due to standards. Perhaps these should be outcome not process focused and the issue be re-visited and re-appraised accordingly.

Local offal markets are shrinking but overseas markets growing. The systems used for quality assurance are generally not aligned with overseas market requirements. There is potential in the market for edible offal exports to China which is being supported by trade negotiations. An opportunity exists to re-orientate quality systems to overseas market needs. Offalcom has been seen as a positive MLA initiative by those that are aware of the project work.

Generally feedback from interviewees indicates that the regulatory framework including AQIS, DAFF, state meat authorities and local plant staffing tends to lead to unwarranted regulation and often misunderstanding at local level. There is a communication void exacerbated by historical procedures which may influence unduly sensible and practical approaches. A systems review is suggested, MLA could play a central role in initiating this review process between regulators and industry.

Significant differences exist between the application of inspection standards at different plants resulting in variable recovery rates. A common approach to training was highlighted as a possible solution. This may be less of an issue at larger plants which have better systems and training.

At least one interviewee observed that some abattoirs may under-value recovery of offals due to lack of awareness of markets and methods of recovery.
There is growing demand for new and innovative offals which are also generally not understood. Training has not kept pace with such opportunities. Both technical understanding of appropriate requirements followed by training tools and knowledge is suggested.

Liver abscess incidence seems to be increasing with grain fed cattle. MLA might consider a study to identify the extent and provide workable management solutions.

**Summary:**

- Existing methods of offal inspection is resulting in inefficiencies due to excessive downgrading.
- There is considerable variation in levels of downgrading between small and large abattoirs and between states. There needs to be greater consistency in this inspection system.

- There is opportunity to review quality procedures to better align with overseas market needs for edible offal.
- Inspection training is seen as a major limitation impacting upon edible offal recovery. There would seem to be no nationally consistent approach to training for inspection of offals.
- Better information on disease risks which can be used for training may reduce waste.
- Differing plant sizes indicates variable needs for support. Larger plants seem to have solutions but under-resourced smaller plants seem to have recovery issues and consequent offal wastage.
- Technical knowledge followed by training tools are required for newer non-traditional offal recovery.
- Liver abscess incidence has increased; there is a need to better understand the incidence level and management options.

# 4 Analysis of Issues

## 4.1 Communications & Strategy

| MLA Co-Products Issue | Outcomes expected | Analysis |
|---|---|---|
| Strategic approach- cycles last 10 years | Consistent approach, each year contributing progress to the next | A 1997 MRC review identifies a plan to achieve 50% increase in value from co-products and 50% reduction in damage (quality issues). MLA strategy identified in 2000 states “improve industry returns and maximise the value through innovation and better utilisation of co-products”. Most recently the plan states “to improve the returns for co-products; protect market access for traditional uses of co-products and to develop alternative uses for co-products”. While these approaches are largely consistent, the year by year plans have varied according to shorter term need. Most work has been focussed on rendered products. This emphasis may have neglected opportunities with the end user stakeholders (eg stockfeed users rather than renderers) and product categories (eg skins/hides, offals). |
| Strategic approach - lack of familiarity with the Co-products Program | Stakeholders should be familiar and supportive of program outcomes | Stakeholders interviewed commonly advised a lack of familiarity with the program, particularly the detail. The strategic approach mostly seemed relevant when explained. Most support maintaining access and new applications. MLA’s contingency planning work has been poorly communicated and addressed with individual stakeholders. |

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| Communications - including Fifth Quarter, workshops & industry liaison via various stakeholder Associations. | Stakeholders familiar and pro-actively contribute to projects. Outcomes successfully implemented by stakeholders. | Most were familiar with Fifth Quarter or its intent. It is, however, in-frequent and could be more widely distributed.<br>Workshops, where held, were supported but there is a need for workshops to be held more frequently.<br>A common improvement suggestion was use of email and the relevant industry association for distribution.<br>The lack of an MLA “face” was commented to better represent MLA and provide for follow up. |
| Consultation - variable amongst various stakeholder groups. | Effective consultation during project planning, reporting and follow up to achieve stakeholder ownership. | While larger groups seem committed, many stakeholders are unaware and feel ostracized from the process. They are, therefore, un-committed to outcomes.<br>Opportunities are being lost due to inadequate consultation. |

## 4.2 Rendering

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Review of rendering processing systems | Documentation of the rendering process and its impact upon the quality of meat meal produced. | There is a view that renderers already know about the process of producing meat meal and as such little more can be added to this knowledge base. Larger renderers see this as an area of competitive advantage and they work closely with equipment suppliers to address processing control issues. |
| Alternate rendering processes | Support the development of the ADT rendering process | MLA has funded work on the ADT rendering process. Industry does not view the original project work as being beneficial and there has not been any uptake of this technology. Companies remain committed to known existing technology which is recognised as working.<br>The more recent MLA project funding looking at the use of the ADT process to render SRM is seen in a much more positive light. Industry views this as a positive initiative as the issue of SRM disposal would have wider implications for the industry.<br>Further work is needed to validate the ADT process for SRM processing, this work could be done in conjunction with international bodies looking to address the same risk issue. |
| Evaluation of methods of producing high protein and low ash meat meal satisfying end user demand for this premium product. | Successfully defined processing methods to produce high protein and low ash meat meal. | It is recognised that MLA projects have defined the desire by end users to have access to higher protein and lower ash meat meal. This providing a product more suited to aquaculture production, as well as being more valuable in petfood, pig and poultry feeding. R&D work has defined methods of producing this type of meat meal, either through segregating raw materials prior to rendering or separating meat meal into different fractions post rendering. There has been no significant uptake of this technology and end user markets remain dissatisfied in not being able to access these higher protein meat meals. |
| Provision of benchmarking data for the rendering industry. | Development of the Spreadsheet Rendering Model which allows capture of data relating to offal recovery and efficiency data. This | Industry has little knowledge of this project and this will be influencing some stakeholders' views about whether this type of work should be undertaken by |

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| | provides a practical management tool which can be utilised by industry. | MLA. The acceptance and use of this work ranges from larger abattoirs who are very negative about MLA funding this work, through to companies looking to trial the model to assist them in running their co-products business. |
| Support in the initial steps of defining industry best practice procedures in hygienic rendering. | Industries Code of Practice and Australian Standard for Rendering have evolved from the initial MLA project work. | This has been extremely successful work which is well received by all industry stakeholders. This type of MLA project work in defining best practice procedures which can be used as the benchmark for industry compliance is seen as an essential role for MLA. It is anticipated that there will be on going need to address issues in improving the Australian Standard and MLA projects should be used to address technical aspects that arise. |
| Provision of practical information to industry to further improve industry practices reducing the risk of microbial contamination and transfer through the feed supply chain. | Salmonella Problem Solving Guide compiled. | The presence of microbial contaminants is seen as an ongoing risk to the rendering industry. There is strong support for MLA to continue projects that foster continuous improvement in this area. The Salmonella Problem Solving Guide is eagerly awaited, although there are differing levels of knowledge regarding the availability and some doubts about easy access to this guide. |
| Compilation of best practice steps in controlling risks posed through environmental factors to abattoirs and renderers. | Industry Practice Guidelines for Environmental Management compiled from industry contributors. | This project is well structured to respond to one of the major issues faced by abattoirs and renderers. All stakeholders have identified positive outcomes which can result from MLA's initiation of this project. Whilst some stakeholders had no knowledge of this project work, they are all seeking to access material which assists them in addressing environmental challenges. |
| Assessment of the level of biogenic amines in Australian meat meal and the implication for pig and poultry feeding. | Survey data on biogenic amine levels in meat meal and recommendations for processing to reduce the levels. | This project work was successful in addressing a significant issue that was of concern to the pig and poultry industries. Whilst the survey work identified variable levels of biogenic amines in meat meal, there were also clear recommendations for processing procedures to reduce the level of biogenic amines in meat meal. Although the issue has not gone away, the MLA project work greatly reduced the extent of the |

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| | | problem by objectively defining the level of biogenic amines in Australian meat meal. |
| Methods of increasing the efficiency of conversion of tallow to biodiesel | Project work has been initiated. Industry aim is to see increased demand for tallow resulting in higher tallow prices to renderers. | There is an expectation that conversion of tallow to biodiesel will provide increased demand and financial returns to the industry by converting lower grade tallow into biodiesel. There is strong support for MLA to complete work in this area to ensure the meat industry has capacity to fully capture benefits that can be obtained. There are some ill-informed assumptions relating to the acceptance and use of tallow by biodiesel producers which need to be addressed.<br>A concern also exists about the use and value of co-products from the biodiesel process which may benefit from R&D input. |
| Contingency Planning for BSE including the removal of SRM's from the food chain. | Contingency plan written and economic analysis completed. | This area of MLA work has unanimous agreement as being of extreme importance in terms of risk management should moves be made to implement removal of SRM from the feed chain. Whilst industry agrees with this work and the associated level of confidentiality, there is a general view that this contingency planning process needs to be extended through to on site abattoir and renderer contingency plans. |

## 4.3 Aquaculture

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Completion of nutritional work to define whether meat meal can replace fish meal in various aquaculture species. | World leading research was completed which clearly shows meat meal can replace some fish meal. The level of replacement increases with the use of high protein and low ash meat meal | The application of this research has been limited due to the impact of BSE and reduced confidence in using meat meal for aquaculture feeding.<br>Uptake of meat meal use has also been limited by the lack of availability of high protein meal. |
| Asian market survey work to define market applications. | Survey work completed for a number of Asian countries. | Market opportunities were defined, these being prior to the escalation of BSE and limitations placed upon use.<br>Market opportunities still exist and need to be revisited by meat meal exporters. |

## 4.4 Petfood

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Maintain access to current markets. | Reduction in contaminants in petfood raw materials to levels acceptable to petfood manufacturers.<br><br>Better separation of offals, specialised products and opportunity to pre-process to improve quality<br><br>Reduction in calcium & phosphorus levels and consequently higher protein | There has been no evidence of improvement in incidence of contamination. Petfood manufacturers regard quality as an expectation not a reason for adding value. Petfood companies interpret this inattention as lack of interest.<br>Close co-operation between processor and petfood company is most likely to produce suitable quality and product presentation outcomes. Such commercial relationships protect exclusivity sought by petfood companies.<br>High levels of Ca and P are raised as a barrier to increased usage. Higher protein would also provide a bonus. |
| Investigate opportunities to add value through new market initiatives | Nutritionally improved products, of high palatability and improved flavour systems are sought.<br><br>MLA are investigating nutraceuticals present in meat products for use in petfood | These are an unknown value as processors are largely unaware of such opportunities. Care is needed however to protect petfood company competitive advantage.<br>Nutraceuticals are topical and of interest and there is market opportunity for attributes that can be marketed. |

## 4.5 Stockfeed

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Assessment of stockfeed industry requirements | Completion of feedback projects defining needs of stockfeed end users. | Meat meal consistency has been repeatedly identified as the major issue limiting use of meat meal in pig and poultry feeding. Nutritionists downgrade meat meal nutrient specification due to its variable quality; this reduces prices paid for meat meal relative to soybean and canola meal. There is also a decline in the levels used within feed rations.<br>The market operates through confrontation, with meat meal, blood meal and tallow supplied as traded commodities with highly volatile monthly pricing. This is in stark contrast to the suppliers of vegetable protein meals who operate long term supply contracts with feed companies. |
| Increase in use of Australian meat meal, with emphasis on export markets | Australian MBM Nutritional Guide written and provided to industry.<br>Conduct of meat meal workshops in China. | The Nutritional Guide has provided positive support to exporters of meat meal. Further follow up in China is considered necessary.<br>Within the domestic market the Nutritional Guide has not been widely used by renderers. Nutritionists indicate that the research data contained within the guide provides a good consolidation of published data.<br>Some exporters have, however, not seen the guide and the success in providing this information to exporters has been a limitation. |
| Consultation with stockfeed industry. | Whilst stockfeed is the largest end user of co-products, the level of consultation MLA has with this end user industry is minimal. | Co-products such as meat meal, blood meal and tallow must compete against other raw materials for inclusion within stockfeed. MLA does not have any system of meeting with key influencers within the stockfeed industry. This is in contrast with other industries such as the pulse and vegetable protein meal sectors who actively work with the stockfeed industry to influence the use of their supply products.<br>Whilst it could be assumed this is the role of ARA, there is a need for MLA to foster a regular forum with the major pig and poultry nutritionists. |

## 4.6 Skins & Hides

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Improve hide and skin quality by reduction in damage | Mechanical pullers may help but better training is essential to avoid poor practices. | It is easy to salt hides and sell to a trader who does not demand quality. While this conceals quality issues pricing probably reflects the quality supplied. Local processors are seeking quality, but it appears difficult for them to gain abattoir interest in supporting their quality endeavours. |
| Improve feedback of quality parameters and value to producers through hide and skin identification systems | Systems trialled and some recommended for field utilization. | A diverse supply chain with poor communications and any strong commercial incentive to implement an ID system, diminish the opportunity. There are some opportunities with local processors who are seeking such support.<br>Livestock producers who manage their branding, disease and handling better are not rewarded and this requires review.<br>Review of branding regulations are overdue particularly now that the NLIS system is in place. |
| Improve hide quality through improved processing systems | Methods developed to preserve quality. | Local processors are seeking quality, but it seems too difficult to gain abattoir interest, particularly with easy options to salt and sell with minimal input. |
| Develop training materials and brochures to assist skills and improve quality | Atlas of training materials produced and available. | There is little recognition amongst stakeholders of training materials being available.<br>Labour availability at abattoirs limits any training aspirations. |

## 4.7 Edible Offal

| MLA Co-Products Issue | Project Outcomes | Analysis |
|---|---|---|
| Facilitate increased recovery to add value through the co-products value chain. | Change to inspection procedures and processes were reported to enable improved recovery rates.<br>Provision of improved training to inspectors to reduce inspection errors.<br>Improve recovery of acceptable food safety by process modification (eg hoofs, lamb brains & tongues). | Recovery of offals are still considered by stakeholders to be sub-optimal especially in smaller plants.<br>MLA training materials appear largely unknown to stakeholders interviewed.<br>Partnership projects focused on specific offals are largely unknown by stakeholders. |
| Expand export trade if particular market criteria can be achieved. | Investigated processing & storage conditions needed to overcome specific quality hurdles for Saudi Arabia.<br>Investigate and recommend changes to quality procedures in order to meet requirements from China | Appears largely un-successful as seems still to be an obstacle.<br><br>Trade barriers still seemingly exist to achieving required quality requirements |

# 5 Recommendations

## 5.1 Communications & Strategy

**1.** **Program Strategy** - MLA should retain its existing co-products program funding strategies. The policies in place are recognised by the majority of end users and there is solid support for these strategies. There is a lack of familiarity with the detail of the strategy and a need to further involve stakeholders in contingency planning.

**2.** **Final Reports** generated from R&D projects need to be made more readily accessible to industry stakeholders. MLA needs to review the method of provision of co-product program reports to industry. Existing methods of making reports available on request needs to be combined with promotion upon completion of reports and access availability. The utilisation of email project report summaries should be considered, with internet download capacity for access to full reports. Whilst some reports will require confidentiality and restricted access, many reports should be freely available with open access encouraging report use by the relevant parts of the industry.

**3.** The **Partners in Innovation Program** offers capacity for MLA to gain greater funding leverage for project work. This provides a powerful tool for the transfer of technology directly to commercial application. MLA needs to have a communication program to inform stakeholders of PIP outcomes at the conclusion of relevant confidentiality expiry timelines.

**4.** A **communications plan** should be developed with a defined action plan for MLA to better communicate with co-products stakeholders. This plan needs to define how MLA is to communicate with various parts of the co-products supply chain including abattoirs/renderers as well as end users. Such a plan may include more regular workshops, Fifth Quarter being produced regularly with improved distribution and the use of email as the preferred communication medium. Hard copy mail-outs to companies often do not get circulated, whilst electronic email copies can be more readily circulated within companies.

**5.** **Co-products communication targets** need to be better defined. These targets are individuals within various stakeholder companies. For many companies there needs to be multiple communication targets as MLA needs to communicate to different levels within each company. It is recommended that MLA review its existing contact register for all Co-products Program communications.

**6.** The use of **workshops** needs to be increased, with these being held in conjunction with industry associations. Workshops are seen as a tool for MLA to gain stakeholder involvement as well as provide extension of project work results. Workshops or forums should be regularly held with abattoirs and renderers.

**7.** **Consultation** is perceived as being inadequate by co-products stakeholders. MLA needs to adopt more widespread consultation in both project planning and review in order to foster commitment to outcomes. MLA should define a method of engaging relevant stakeholders at the completion of projects to review the outcomes and define methods of capturing value from the R&D work. The potential use of an industry representative committee to undertake project reviews should be considered.

**8.** **Industry Advocate -** MLA should appoint an informed and capable advocate to develop two way communications on all aspects of its Co-products Program. This person would become recognised across the supply chain, taking opportunities to attend and speak at various industry functions, the role being to promote both MLA and the co-products program outcomes. The envisaged role would require both a technical skill base, together with a market driven motivation to promote co-products.

**9.** **Industry Associations -** MLA should adopt a policy of participation (as a member or regular contributor) to stakeholder Associations. Such appropriate Associations represent a convenient access point for end user contact. This would enable regular and consistent feedback to disparate groups of stakeholders ensuring all interested parties can be accessed. An initial list is provided in Appendix 4. Many of these are not "meat industry" groups and therefore not captured by traditional communications to the industry.

These Associations may facilitate access to individual stakeholders without requiring upkeep of contact databases.

**10.** MLA has generated very valuable information from co-products projects conducted over the last 10-15 years. It is recommended that MLA compile this information into a **Rendering Issues Manual**. This manual would provide a number of very positive outcomes for MLA:

- Provide a means of revisiting the results of various projects.
- Provides a consolidated reference point for MLA co-products projects.
- Provides to industry a re-enforcement of the value MLA delivers to industry in completing R&D.
- Increases opportunity for commercial uptake of technology
- Reminds the supply chain of the importance of co-products and the market opportunities that exist.
- Stimulate interest in potential new project areas.

The intent of the Rendering Issues Manual would be to provide a concise document that defines projects completed by MLA and the outcomes which resulted. Where projects provided clear recommendations for the wider industry these would be reprinted. This manual would be made freely available to all industry participants and should be distributed by MLA as well as industry bodies such as the ARA.

The use of a Rendering Issues Manual would be similar in approach to that being implemented for the Industry Practice Guidelines for Environmental Management.

**11.** During the conduct of this review, it has been identified by MLA that there is a **Meat Industry Service Contract** with Food Science Australia to address technical issues as well as promote R&D results. It is recommended that MLA address the various communication issues identified in this report in the context of better defining the specific service role provided by Food Science Australia.

## 5.2 Rendering

**12.** **Processing technology –** this area should be left to industry to address as they have the in house skills and knowledge base, together with co-operative support of rendering equipment suppliers. This is not seen as a core funding area for MLA.

**13.** **Alternate Processing Technology –** MLA should continue to fund projects addressing the potential threat of SRM removal and disposal. The work undertaken with ADT is seen as beneficial to the wider industry and MLA plays a key role in fostering this specific technology development. Further work should be undertaken to validate the technology in a scale-up plant. MLA should investigate co-operative work with relevant international research groups.

**14.** **High Protein and Low Ash Meat Meal –** renderers need to be reminded of the market opportunities for the production of higher quality meat meal. This should be combined with provision of data from previous R&D projects which defined practical means by which renderers can produce such products. Although disposal of the high ash residue remains an

issue, it is believed that the opportunity is such that industry should revisit this market application for co-products. MLA has a role in reminding industry of prior project work and the missed market opportunities which they could be pursuing.

**15.** **Business Management tools –** MLA needs to consult with renderers regarding the interplay between conducting R&D and provision of business management support. Specifically, work on the Benchmarking Rendering Model has a significantly divergent level of acceptance. MLA should engage industry earlier in the project management process to ensure major stakeholder views relating to the potential technology uptake is well canvassed.

**16.** **Codes of Practice –** MLA should continue to fund R&D projects that address quality standards. This will include work to clarify technical issues or better define minimum standards and procedures in the rendering industry.

**17.** **Microbial Presence –** MLA should continue to fund projects which foster continuous improvement in the area of salmonella and other microbial presence in co-products. The Salmonella Problem Solving Guide needs to be extensively promoted to industry to ensure all participants are aware of this resource material. Use of regional workshops should be considered as a means of extended this project work to industry.

**18.** **Industry Partnership –** It is recognised that the ARA is the key industry body representing renderers. It is recommended that MLA continues to work with the ARA in fostering commitment from renderers in the strategic planning for co-products R&D projects.

**19.** **Industry Practice Guidelines for Environmental Management –**The outcomes of this work in terms of provision of materials to assist abattoirs and renderers need to be actively promoted to ensure all industry stakeholders are made aware that this resource material is available. MLA should consult to ensure the Guidelines meet all the environmental issues the industry faces. It is anticipated that further environmental project work needs to be completed, with this potentially being captured within the Partners in Innovation Program.

**20.** R&D work in the areas of **energy and water use efficiency** have been identified by stakeholders as new work areas for MLA funding. Energy is seen as the largest cost area for renderers, whilst excessive water use in offal areas is recognised as a wasted resource whilst putting greater pressure upon effluent disposal systems.

**21.** **Biogenic Amines –** There is no call for further work in the area of biogenic amines. Previous recommendations to industry need to be presented in a ready-to-use format which could form part of a Rendering Issues Manual.

**22.** **Tallow and biodiesel –** further project work needs to be completed looking at the implications of conversion of tallow to biodiesel upon the rendering industry. This work should look to better define the biodiesel industries market requirements and the potential market access and returns to the red meat industry. Many renderers hold an overly optimistic view that they will be able to dispose of all their lower grade tallow at premium prices. In reality, tallow specifications needed by biodiesel producers may limit the use of these lesser tallow grades which will need to continue to be used in stockfeed. In addition, the potentially significant increase in supply of co-products such as glycerine and fatty acid by-products from vegetable oil biodiesel production, may have a negative impact upon feed tallow prices. MLA should consider conducting a project to better define the potential impact biofuels production will have upon the rendering industry.

**23.** **SRM Removal and Disposal Contingency Planning –** MLA needs to better define how it can engage and communicate with abattoirs and renderers in relation to contingency planning for SRM removal and disposal. Whilst industry knows that contingency planning work

has been undertaken, there is a view that they need to be consulted with so that they can implement their own planning process.

## 5.3 Aquaculture

**24.** **Nutritional Research –** The nutritional work in replacing fish meal with meat meal has demonstrated that this can be done practically. MLA should not fund any further work addressing this issue.

**25.** **Market Evaluation –** considerable effort went into defining market opportunities for meat meal to various Asian aquaculture markets. Additionally significant market opportunities have opened up in Vietnam and China. Whilst repeating this market evaluation work is not recommended, MLA should revisit this work in providing to exporters a reminder of the market opportunity for meat meal to Asian aquaculture use.

**26.** **Higher Protein Meat Meal –** MLA needs to re-acquaint renderers and exporters with the aquaculture industries' desire to access higher protein meat meal and their ability to pay higher prices for premium products which can replace a portion of the fish meal in use.

## 5.4 Petfood

**27.** **Training -** Quality is an expectation of the petfood industry: an attitude anecdotally not observed by the meat industry in processing petfood ingredients. MLA should prepare and implement a training system in offal processing procedures, hygiene and cleanliness with petfood company input to overcome barriers and foster change.

**28.** **Calcium and Phosphorus** - High ash and low protein limits the use of meat meal in petfood. MLA should encourage at industry level production of meat meal with reduced levels of ash and foster closer associations between supplier and customer in achieving this outcome.

**29.** **Innovation -** Seemingly there is a lack of a proactive push evident from meat industry participants. Innovations are sought by petfood manufacturers but competitive advantage and exclusiveness grows market share for fierce petfood competitors. MLA should proactively seek partners and undertake product innovation projects which also protect their commercial position.

**30.** **Export** opportunities exist for petfood co-products but consumers are being conditioned to believe use of meat industry co-products should be avoided. MLA should undertake generic marketing of the advantages of meat industry petfood ingredients in target export markets to challenge this incorrect belief.

**31.** **Nutraceuticals** are of topical interest to petfood manufacturers. MLA should ensure its current work is widely reported and outcomes available for implementation by petfood manufacturers.

**32.** **Industry Association -** MLA should continue to engage via the industry association through active participation of PFIAA.

## 5.5 Stockfeed

**33.** **Meat Meal Consistency –** renderers and traders need to be reminded that stockfeed manufacturers are reducing meat meal use due to its inconsistent nutritional value. The only means of reducing this trend is to supply meals that are consistent in protein, fat, moisture and

ash content. MLA needs to continue to promote the view that suppliers of meat meal must cater to the customer requirements.

**34.** **Australian MBM Nutritional Guide –** MLA needs to have clear methods of delivering resource materials to end users. This project has been found to be a very positive initiative for some exporters, whilst other significant exporters have not seen the Nutritional Guide and so have not taken advantage of the project work. MLA needs to re-release this resource tool to industry.

**35.** MLA needs to more actively engage with the stockfeed industry to promote the research projects being undertaken in co-products. This should include **end users forums** convened in conjunction with ARA and potentially the Stock Feed Manufacturers' Council. The intent of such forums would be two fold; 1. Inform and educate industry on the research work which is being undertaken; and 2. Seek feedback on further research which could be undertaken to add value to co-products used as stockfeed.

**36.** Stockfeed users can be diverse in their attitude to use of animal proteins. The industry is represented in each state by its **Stock Feed Manufacturer's Association** and federally by their peak body the Stock Feed Manufacturers Council of Australia. MLA should ensure it has representation at state level perhaps through membership or sponsorship to ensure its participation.

## 5.6 Skins & Hides

**37.** **Automated systems -** Labour availability at abattoirs makes training difficult to justify. MLA should review with stakeholders options for development of automated systems for skin and hide processing and also review if simple training initiatives can be implemented.

**38.** **Quality interest and commercial benefit -** Local processors are seeking quality but find it difficult to gain abattoir interest. It is easy to salt hides and sell to a trader who does not demand quality. MLA should foster a closer relationship between local hide users and meat processors to define common goals and assist in identifying solutions of common commercial benefit.

**39.** **Environmental regulations** were suggested by interviewees as a risk to local processing resulting in increasing export of green hides and their value. MLA work to provide responsible but workable environmental guidelines for processors is considered essential to maintain the industry in Australia.

**40.** **Processing knowledge -** MLA should investigate opportunities to better process sheep skins as air drying in skin sheds is old technology and opportunities for improvement are not well known. Technology for treatment of high quality lamb and calf skins is also generally unknown.

**41.** **Stakeholder feedback -** MLA should initially ensure there is industry alignment and consensus by developing liaison with Australian Skins Hides and Leather Exporters Association and the domestic Leather Association followed by investment in better technology.

**42.** **Skin/Hide Identification -** MLA should initiate a review of branding regulations now that the NLIS system is now in place. Stakeholders indicated that this single initiative would reduce downgraded hides significantly.

## 5.7 Edible Offal

**43.** **Existing prescriptive procedures** - MLA should undertake a review of processing standards which appear too prescriptive and need to be more outcomes focused using a risk analysis approach.

**44.** **Align quality procedures with overseas market needs -** Export opportunities exist but are difficult to access due to quality standard differences. Although there are trade barrier issues, MLA needs to consider promoting a review of the regulatory system, including redefinition of the roles of various agencies to improve communications especially as these translate to the local processor level.

**45.** **Training** - MLA should update inspection training systems and technical knowledge so a common and appropriate approach exists between plants. While larger plants may have solutions, under-resourced smaller plants seem to have recovery issues and consequent offal wastage. Technical knowledge followed by training tools are required for newer non-traditional offal recovery. This is likely to require review with the various stakeholders (AQIS, State Meat Authorities, AMIC, etc) as well as training provider groups such as MINTRAC. The projects that formed part of OFFALCOM group might be combined as the source material for initial review.

# 6 Appendices

## 6.1 Appendix 1

### Reviewed Project Listing

Projects reviewed include completed MRC (prior to 1998) and MLA funded projects as well as a number of projects in progress.

| Project Code | Project Title |
|---|---|
| **Rendering** | |
| COPR.004a | Rendering Technology Audit |
| COPR.006 | Meatmeal for fertilisers |
| PRCOP.037 | Alkali dehydration rendering process |
| PRCOPIC.023 | Cost options for disposal of specified risk materials |
| PRCOPIC.026 | Validation of Heat Treatments used in rendering |
| PRCOPIC.031 | Salmonella in meat meal |
| PRCOPIC.033 | Review of costs of rendering |
| PRCOPIC.036 | Development of a Rendering Industry Best Practice Guidelines for Environmental Management |
| PRCOPVA.005 | Value adding to blood stick water |
| Rendtech | Rendtech Report |
| M.746 | Draft code of practice rendering |
| M.745 | Separation of MBM into components |
| M.743 | Utilisation of ash components of meat meal |
| US.021 | Biogenic Amines in meat meal |
| PSHIP.133 | Airless Rendering Process |
| PSHIP | Super Heated Steam Blood Meal Dryer |
| **Aquaculture** | |
| COPR.013 | The Prospects for Marketing Meat Meal for Inclusion in Indonesian Aquaculture Diets |
| M744 | Processing of Meat Meal for Utilisation in Aquaculture Diets |
| PRCOP.008 | Survey of the nutrient composition of meat meals and their use in aquaculture feeds |
| PRCOP.009 | Consumer sensory evaluation of silver perch culture |
| PRCOP.011 | In pond evaluation of high meat meal diets for the |
| PRCOP.012 | The Prospects for Meatmeal in Aquaculture Diets |
| PRCOP.015 a,b,c | Meat meal for aquaculture: Indonesia, Thailand & Taiwan. |
| CS.233 | Preliminary evaluation of MBM in aquaculture diets- prawns |
| **Petfood** | |
| PRCOPIC.009 | Dynamics of the Australian Petfood Industry |
| PRCOPIC.024 | Minimisation of Physical Contamination of Meat Co-Products Used in Pet Food |
| PRCOPVA.014&016 | Cost-benefit analysis of pet food operations in red meat processing |
| PRCOPVA.015 | Top 5 Pet Food Nutraceuticals |
| M.257 | Pet Food Market Study |
| **Stockfeed** | |
| COPR.004b | Customer Requirements MBM |

| Project Code | Project Title |
|---|---|
| PRCOPIC.005/PSHIP.135 | Technical dossier Australian meat meal/MBM Evaluation & Dossier |
| M.258 | Meat meal & tallow and its markets |
| M.829 | Meat meal and tallow market report update |
| **Bioactives** | |
| PRCOPIC.028 | Patent search. Extraction and uses of collagen |
| PRCOPVA.003 | Feasibility Study into the Development of Cost Effective Large Scale Blood Plasma Fractionation Systems |
| PRCOPVA.006 | High value animal blood plasma fractions |
| **Skins & Hides** | |
| DAW.039 | Skin Preservation & Alternative Fellmongering |
| M.668 | Feasibility study of hide and leather identification systems |
| M.670 | Using an array of punched holes to trace cattle hides through the tanning process |
| M.254B | Hide Identification and Assessment System |
| CS.090 | Utilisation of waste skin pieces |
| CS.138 | Skin Quality & Abattoir Practices |
| PRCOP.034 | Development of Sheepskin Technical Advisory Kit |
| COPR.012 | Processing sheep and lamb head pieces. A preliminary assessment |
| **Industrial** | |
| PRCOPIA.005B | Subject matter search - Application of Hydroxyapatite (HAP) from hard bone as a chemical catalyst |
| PRCOPVA.002 | Non Food/Feed Uses of Rendering Products |
| PSHIP | Cost effective production of bio-diesel from tallow |
| **Edible Offal** | |
| M.256 | Edible Offal Market Study |
| COPR.009 | Offal Pathology: an analysis of meat inspection procedures |
| PRCOP.016 | Enhanced recovery of co-products- tripe etc Experiment design and validation of modified offal |
| PRCOP.016 Part 2 | Enhanced recovery of co-products- tripe etc Final report |
| PRCOP.029 | Risk analysis survey of sheep meat processors |
| PRCOP.033A | Beef and lamb offal specifications for China |
| PRCOPVA.001 | Recovery of Sheep Brains and Tongues. |
| SASO.01 | Storage Life of frozen edible offal exported to Saudi Arabia |
| PSHIP.169C | De-hairing of cattle and sheep heads and hoofs |

## 6.2 Appendix 2

### Questionnaires

48 Interviews were completed with 25 individuals across 19 different companies. Interviews were all conducted face to face as the preferred means of discussion.

Our undertaking was to “conduct stakeholder interviews, collate responses / feedback in relation to MLA funded co-products projects and the degree of success from stakeholder perspective”.

Interviews undertaken included a range of stakeholders, from:

- MLA staff & advisors
- Meat industry participants – abattoirs and edible offal producers
- Renderers and users of meat meal, tallow and blood meal
- Hides & skins operators
- Pet food industry
- Relevant researchers and consultants

MLA Co-products projects cross a range of aspects from both a practical and technical perspective. As such not all projects are relevant to each and every stakeholder. Consequently interviews were conducted with a broad range of participants to ensure the majority of projects were included within the interview process.

An interview questionnaire was formatted, with test interviews being conducted. Stakeholder interviews were conducted in face to face meetings to increase the level of response.

## 6.3 Appendix 4

List of suggested stakeholder groups

| Group | Organisation | Contact |
|---|---|---|
| **Renderers** | Australian Renderers Association | Graeme Banks, Executive Officer |
| **Edible Offal** | Australian Meat Industry Council | Kevin Cottrill, Chief Executive Officer |
| **Feed Mills/Nutrition** | Stockfeed Manufacturers Council of Australia | John Spragg, Executive Officer |
| **Hides/Skins** | Australian Hides Skins and Leather Exporters Association<br><br>Leather Association | Graeme Banks, Executive Officer<br><br>(contact unknown) |
| **Pet Food** | Petfood Industry Association of Australia | John Aird, Executive Manager |