

Disease and Contamination Image Library

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1.0 Executive Summary

The development of a world class digital resource to support the training and assessment of red meat personnel has been achieved through the disease and contamination image library produced in this project.

The meat industry now has a modern easily accessible resource that contains a large number of examples of diseases and contamination photos that they may not otherwise be exposed to. This resource will be used to enhance training and assessment materials within the Australian Meat Processing Training Package and increase the competency of new and existing industry personnel in the areas of:

- disease recognition at ante-mortem
- disease recognition at post-mortem
- recognition of contamination when MHA monitoring and trimming

Through the image library, the meat industry has the ability to use a wide range of photos to assess competency in disease and contamination recognition which increases the validity of the assessment and ensures that students are truly tested. This can be by Registered Training Organisation's using the images within their training and assessment processes or through the revision tool built into the image library. This revision tool can be used by new students or as a currency assessment tool for meat inspectors returning after a period away from the job.

The benefits for meat industry will be ongoing. The image library will continue to develop and expand as industry personnel commence using it. Not only is there capability to continually upload new images, new categories can also be included to support other areas of the meat industry.

When the image library rollout is approved by AMPC, MINTRAC will monitor the process to ensure that any issues are dealt with efficiently. MINTRAC would like to recommend that a six monthly review of the image library be conducted by MINTRAC through the current Training Services agreement with AMPC. This review will address any changes that have been requested and upload and edit any new disease and contamination images that are collected and approved by industry. This will ensure that the image library remains current and continues to develop as a world class digital resource.

2.0 Introduction

This project aimed to create a world class digital resource to support the training and assessment of red meat personnel, principally meat inspectors and quality assurance staff. This resource will also be valuable for the training of trimmers, stock handlers, livestock managers, livestock transporters and regulatory officers.

MINTRAC has developed an image library as a by-product of a previous project, which contained 2,520 images. However, not all of these images were fully copyright approved, and many do not have technical descriptions developed. This project will review the existing image library and identify further images for inclusion in the upgraded image library produced by this project.

The final resource will be used to enhance the training and assessment materials and increase the competency of new and existing industry personnel in:

- disease recognition at ante-mortem
- disease recognition at post-mortem
- recognition of contamination when MHA monitoring and trimming.

The ability to expose students to images related to a range of pathology associated with any one disease will give them the opportunity to gain knowledge which would otherwise take months if not years to acquire. Likewise with emergency diseases such as tuberculosis, students will be able to see a number of examples of the pathology that they would otherwise not be exposed to.

As part of this project, all of the images contained in the image library will be used to create a student revision/assessment tool. This will be beneficial to new students and meat inspectors returning after a period away for the job. The ability to use a wide range of images to assess competency in disease recognition increases the validity of the assessment and ensures that students are truly tested.

3.0 Project Objectives

The objectives of this project were to:

- create a world class digital resource that will be used to enhance training and assessment materials and increase the competency of new and existing industry personnel in:
 - disease recognition at ante-mortem
 - disease recognition at post-mortem
 - recognition of contamination when MHA monitoring or trimming.

The author should outline the project objectives as specified in the research agreement.

3.1 Heading 1 sample – 13 point

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3.1.1 Heading 2 sample – 12 point

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4.0 Methodology

MINTRAC adopted a four-staged approach to this project, as follows:

4.1 Stage 1

MINTRAC reviewed the functionality of the existing image library which involved the:

- review and upgrade of the library structure in terms of categories, classifications, image nomenclature and identification codes
- review and upgrade of the search facility
- development of access protocols
- development of an assessment tool format.

4.2 Stage 2

While a cursory review of some of the 5,500 plus images was undertaken as part of a Carcase Hygiene Inspection project, most of the collection has yet to be reviewed, categorized and edited. This stage involved an image by image review with the aim of ensuring:

- image clarity
- the technical accuracy of the identification of the disease/pathology/contamination
- the accurate allocation of an image to one or more categories.

4.3 Stage 3

MINTRAC mapped the image library categories against the relevant Unit of Competency. By undertaking this stage, when the identified materials require updating, the images will be drawn down into the updated version.

4.4 Stage 4

MINTRAC developed, in conjunction with AMPC, protocols for industry and RTOs to access and contribute to the image library.

5.0 Project Outcomes

5.1 Review and restructure of the current image library

At the commencement of this project MINTRAC undertook a full review of the current image library including:

- classification and categories for images
- disease and condition nomenclature
- image quality required
- search capability
- photo reference codes.

During this process it was determined that a full restructure was required and that it would be more efficient to completely rebuild a new image library. MINTRAC subcontracted Des Bowler from Management For Technology Pty Ltd to undertake the technical upgrade of the image library database.

The new disease and contamination image library has an inbuilt search facility that has been designed to follow the flow a meat inspector or quality assurance manager would take conducting their duties. These classifications include:

- species, including bovine, ovine, caprine and porcine
- procedure they are undertaking, including ante-mortem, post-mortem and meat hygiene assessment
- observation – what they are inspecting e.g head, viscera, carcass
- diagnosis – the diseases and contamination defects associated with the previous search layers.

Each search layer classification is unique. Therefore, when a selection is made at each level, the consecutive categories at the next level will change depending on the selection. For example if bovine/ante-mortem is selected, the categories under observation would include common conditions and diseases and not the categories that relate to post-mortem. A complete list of classifications and categories can be seen in Appendix 1.

5.2 Technical image review

From previous projects undertaken by MINTRAC and from input from technical consultants, MINTRAC has collected over 10,000 images from Australia and overseas. An initial image review was undertaken by MINTRAC to remove any images that did not fit within the scope of this project (disease and contamination), remove any images that did not meet the image quality and resolution requirements sufficient to be viewed on screen and inserted into a training workbook, remove duplicates, and code the remaining images into the new classifications ready for the image-by-image review by industry technical experts.

With approval from AMPC, MINTRAC contracted four industry experts to conduct the technical image-by-image review. The consultants were some of the most highly recognized and experienced experts in the field of meat inspection and disease identification in the processing industry from Australia and New

Zealand.

MINTRAC facilitated a technical review workshop which brought the consultants together in the MINTRAC office in Sydney along with the database developer, and MINTRAC Project Officers. Firstly, the consultants approved the categories and classifications proposed by MINTRAC. Secondly, the consultants were allocated a species to review and conducted an image-by-image review to confirm the accuracy of the images already identified and accurately identify the images that were unclassified. By having the consultants all together, it has resulted in the consistent identification and description of all images throughout the image library database.

5.3 Use of the image library to support training

The objective of this project is to develop a world class digital resource that will be used to enhance the training and assessment materials and increase the competency of new and existing industry personnel. This has been achieved by the development of an online disease and contamination identification revision tool and by enhancing the training and assessment materials used to train meat inspectors and quality assurance staff.

5.3.1 Disease and contamination identification revision tool

Built into the image library is a revision tool which can be used by new students or as a currency assessment tool for meat inspectors returning after a period away from the job. The image library will randomly select a specified number of images from a selected species (or mixed species) and ask the user to:

1. Name the part (s) shown in the photograph.
2. Identify the disease/condition.
3. Identify what is the disposition required.

The user will be asked to answer the three questions by selecting the correct answer from a dropdown list. For consistency and to ensure the user is meeting the regulatory requirements, the disposition is what has been stated in the AS4696:2007 *Australian Standard for the hygienic production and transportation of meat and meat products for human consumption*.

A revision summary will be available at the conclusion of the exercise which can be used to demonstrate the user's competence.

5.3.2 Enhancing training and assessment materials

MINTRAC is responsible for the development and management of the AMP Australian Meat Industry Training Package. Within the training package, the training and assessment materials for the following Units of Competency will be enhanced by the image library.

- AMPA3069 *Perform ante-mortem inspection and make disposition*
- AMPA3070 *Perform post-mortem inspection and make disposition*
- AMPA3072 *Perform carcass meat hygiene assessment*
- AMPA3073 *Perform process monitoring for meat hygiene assessment*

- AMPA3074 *Perform boning room meat hygiene assessment*
- AMPA3081 *Perform offal Meat Hygiene Assessment*
- AMPA401 *Implement a Meat Hygiene Assessment program*

The Unit-by-Unit listing, that outlines all the resources that are available for each Unit of Competency in the AMP Australian meat Industry Training Package, has been updated to include the image library. This Unit-by-Unit listing can be viewed online at <http://www.mintrac.net.au/traing-lis.asp>

MINTRAC is currently undertaking another AMPC funded project to develop training and assessment support materials for the revised meat safety qualifications including the Certificates III and IV in Meat Processing (Meat Safety).

The image library will be a key resource for the delivery of training and assessment for each of the following units which are in the final stages of being developed:

- AMPA3119 *Apply food animal anatomy and physiology to inspection processes*
- AMPA3131 *Identify and report emergency diseases of food animals*
- AMPA3120 *Perform ante and post-mortem inspection – Ovine and Caprine*
- AMPA3121 *Perform ante and post-mortem inspection – Bovine*
- AMPA3122 *Perform ante and post-mortem inspection – Porcine*
- AMPA3135 *Perform ante and post-mortem inspection – Calves*

During the development of the training and assessment materials for the above units, disease and contamination images have already been sourced from the image library. Also, a generic reference to the image library has been included in the materials to encourage ongoing access and use by future trainers/assessors and will be included with each set of materials.

6.0 Discussion

As a result of stage 1 and 2 of this project, the quantity of images contained in the final version is less than originally anticipated. However, the quality of the contents in the final version is very professional with every image being specific and current.

The image library contains disease and contamination photos found in bovine, ovine, caprine and porcine. The structure of the image library allows users to search through a series of categories from species, inspection process, organ or carcase part, right through to the specific disease or condition.

Each photo, when selected, can be enlarged and utilised to enhance training and assessments materials used to train meat safety officers, QA officers, MHA monitors and stock handlers. Each photo is also accompanied by the following information:

- disease/condition
- short description
- long description
- disposition.

The disease and contamination image library has been piloted at a number of industry events with participants keen to access the image library.

Throughout this project the image library has developed and expanded. It has been identified that the image library will continue to develop and expand as industry commence using it and as further categories are added. However, the image library is ready to be rolled out to industry. Initially, the image library will be hosted by a third party site which allows a link to be added to the AMPC or MINTRAC website or both which would take the user straight to the library. The image library can be accessed at http://www.mintrac.net.au/online/Image_library/login.asp.

The proposed rollout date is 1 June 2016.

When released, meat industry personnel and RTOs delivering meat inspection and quality assurance training will be able to access the image library. To ensure that only authorized users are accessing the image library, first time users will be asked to 'Sign up here'. When the user registers their details an email notification will be sent to MINTRAC to authorize the user and allow them to access the image library. Each consecutive time the user accesses the image library they will be required to 'log in'. Authorized users include meat industry personnel and RTOs delivering meat inspection training.

7.0 Conclusions/ Recommendations

The meat industry now has a modern easily accessible resource that contains a large number of examples of diseases and contamination photos that they may not otherwise be exposed to. Through this project, meat industry personnel can use a wide range of photos to assess competency in disease and contamination recognition which increases the validity of the assessment and ensure that students are fully tested.

MINTRAC would like to make the following recommendations.

7.1 Recommendation 1

MINTRAC would like to recommend that a six monthly review of the image library be conducted by MINTRAC through the current Training Services agreement with AMPC. This review will address any changes that have been requested and upload /edit any new disease and contamination images that are collected and approved by industry. This will ensure that the image library remains current and continues to develop as a world class digital resource.

7.2 Recommendation 2

MINTRAC has been advised that when the upgrade of the AMPC website is complete, the image library will be hosted solely on the AMPC website. MINTRAC would like to recommend that that a link to the image library remain on the MINTRAC website. This is to allow MINTRAC to continue authorizing user access and monitor the number of personnel accessing the image library.

7.3 Recommendation 3

During the review of the previous image library, it was identified that a large number of images related to other categories other than disease and contamination. MINTRAC would like to recommend expanding the image library to include other categories such as yard design through future projects.

8.0 Bibliography

Agriculture and Resource Management Council of Australia and New Zealand, AS 4696:2007 *Australian Standard for the hygienic production and transportation of meat and meat products for human consumption*, CSIRO publishing, Collingwood, Vic.

9.0 Appendices

9.1 Appendix 1 - Disease and contamination image library categories and classification structure

(sent as a separate document).