final report

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Electronic knowledge acquisition of veterinary processes and corrective action to assure food safety in lamb production

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P.PSH.065

Electronic knowledge acquisition of veterinary processes and corrective action to assure food safety in lamb production (EKAVPCA)

October 2013

Executive Summary:

The provider conducted a preliminary survey of needs with selected lamb processors, and was in the process of developing potential solution functional specifications. However, the project was terminated at the first go/nogo stage gate review point by the hosting processor.

Preliminary scoping and independent industry verification

Introduction

Food safety and processes to monitor and control hygiene and quality have been of crucial importance to the Australian meat industry. This project is focused on scoping the IT process for automatic documentation of pathological and non-pathological issues that have an impact on quality and consumer protection especially where food safety is concerned.

The objective of this report is to present the overall scope for the project, to the Go-No Go point, confirming the need for the project by the broader meat industry in Australia, which has been reached.

The report presents the following:

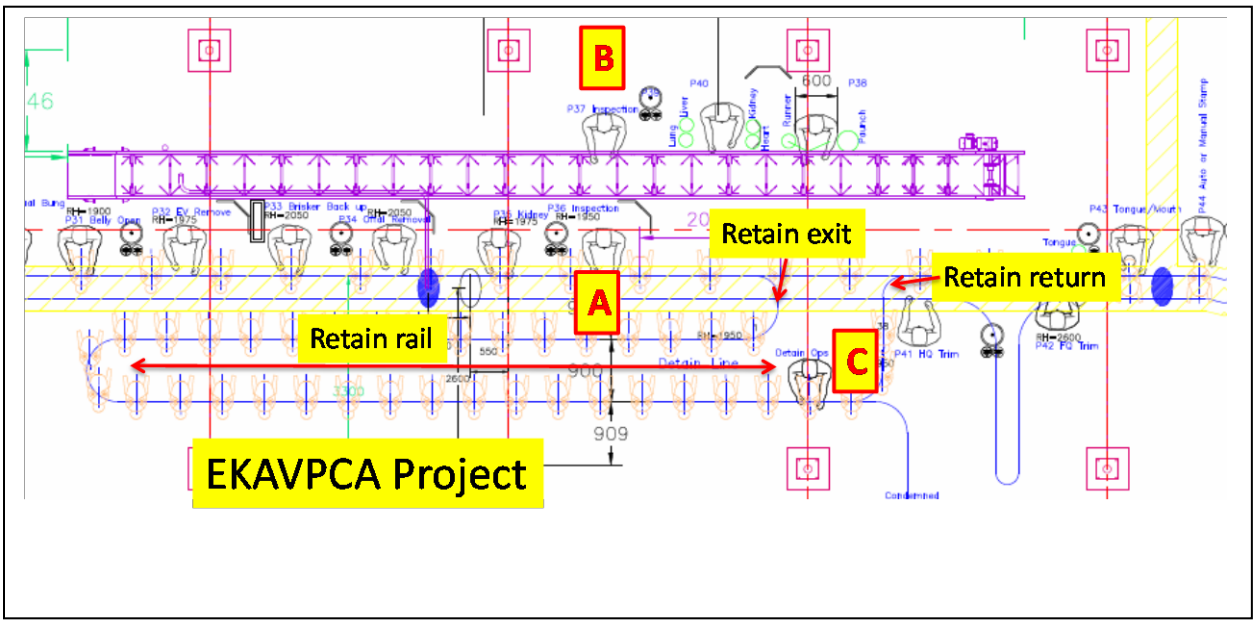
- Overview of the project- preliminary scope
- Confirmation of industry feedback concerning the need for the project.

1. Overview of the project

The current process of inspection uses significant judgement from qualified inspectors in specific positions close to the dressing line in the slaughtering operation. Veterinary assessment of lamb carcasses on the line is performed in the sequence each carcass arrives at inspection points. Figure 1 gives an illustration of the general process, where two inspectors at stations marked A and B inspect the carcass and the viscera/offal respectively.

At A and B, inspectors perform the task of assessment. Only fully conforming carcasses continue on the line, in this case from left to right. Viscera and offal inspection is conducted on the pan conveyor or similar at point B and the fully dressed carcass on the rail travelling to the end of the line is inspected at A. If a carcass is arrested then it is diverted to the retain section for corrective action at C. Position C is not generally fixed in current operations and the person performing corrective action may work along the length of the retain rail as shown.

Retain chain is sometimes powered to move carcasses to the end of the retain rail section or in some places, the carcasses may be hand pushed along this chain, before merging back onto the main rail after corrective action.



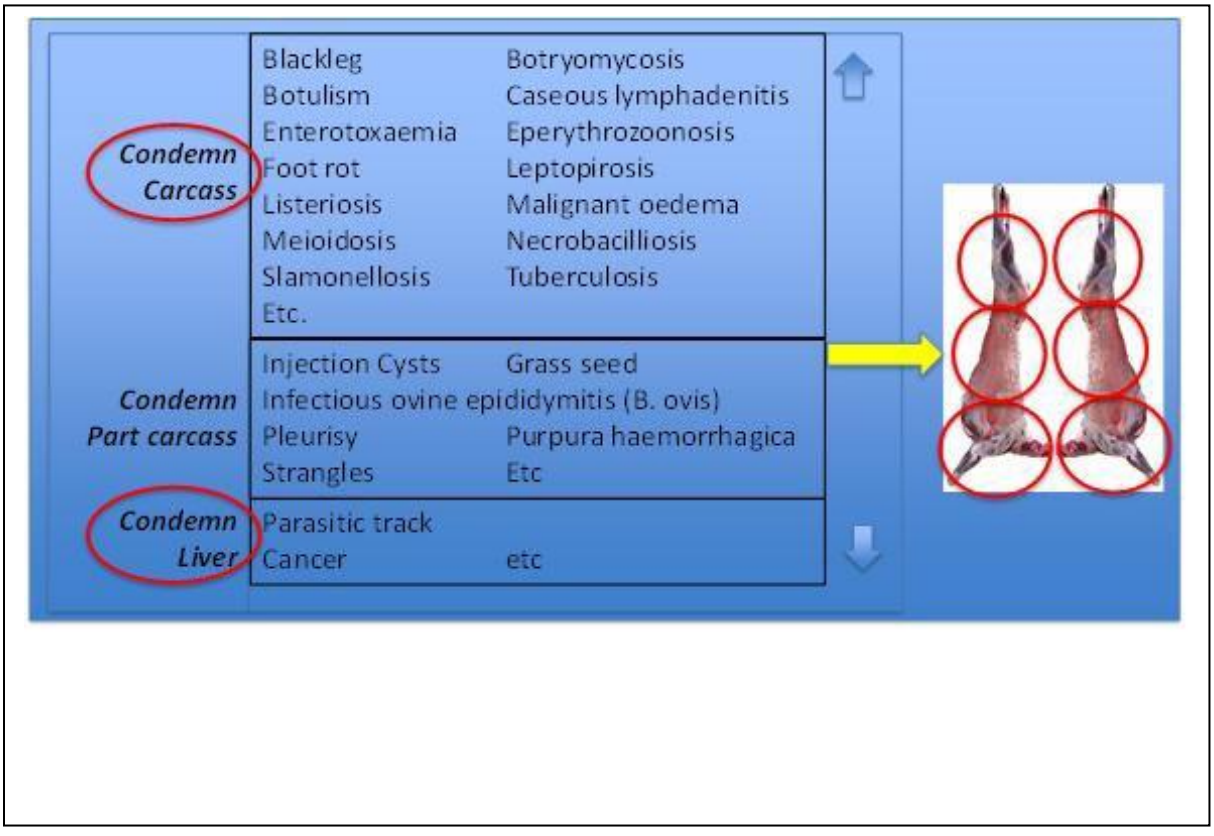
During the total process of inspection and corrective action, little recorded information is made of the nature of the problems observed or corrected. The focus of this project is to introduce and IT solution that has insignificant or no effect on the efficiencies of the current processes, but captures the knowledge applied and the decisions made in the inspection logging the information for use by the industry. In particular, the reasons for rejection and the corrective actions would be logged against each arrested carcass, such information being of use in the management of supply chain as well as identifying opportunities for improvement. Such records also provide assurances for customers

especially in the export market.

The overall scope for the project may be illustrated by outlining the interactive computer based rejection steps allowing acquisition of information at the point of inspection to reject, and during the corrective action process, electronically capturing carcass information as relevant in the veterinary or QA tasks. Figure 2 shows a typical screen that may be used in the process of rejection. Note that inspectors at positions A and B in Figure 1 would use the screen to reject, but there will be little time for the inspectors at these stations to elaborate on the details for the rejection. This task will be part of the corrective action process. Note that Figure 2 is only for illustration, the full details here will be specified in the work under the next milestone.

The approach would be to have touch screens displays at stations A and B (Figure 1) showing the example contents as in Figure 2. The inspector would perform a single touch on the icons shown as red circles. The single touch would register the category for rejection, and as may be noted in the case of partial rejection, the position of the touch may also indicate the region for corrective action on the carcass.

It should be emphasised that the format and the contents of the screen would be defined in greater detail later in the project. A more ergonomic form will need to be defined with field testing to ensure user friendliness. The description here is an illustration of the scope, presenting the overview of the process. The most important aspect is the rejection step, declared by a single touch by the inspectors, keeping the process efficient and simple.



The touch on the red icon would instigate a chain of control steps in relation to the carcass or viscera-offal immediately in front of the inspection points A and B. These steps require a fully automated IT data capture solution as wells as an automatic chain for carcasses to be transferred to and, where relevant, back from the retain rail. It will also be necessary for position C to be suitably located in a fixed position at along the retain rail. Carcasses are to arrive automatically at station C for corrective action in a traceable manner and then carried to a point of rejection or to a point where they can join the main chain after corrective action.

As part of the corrective action process the IT screen would use an information and corrective log screen as illustrated in Figure 3. The screen would display the inspection result for the specific carcasses guiding the corrective action process, whilst it is intended to acquire the details of the problems leading to the rejection of the carcass. The details are to be entered by the operator at station C giving the nature of the problem as part of the data capture procedure. The acquired information on each carcass would then be stored and used in reports, the format of which is user driven on a case by case basis. Clearly standards may be set for an industry wide format and this will be considered under the next milestone. The knowledge acquisition system would capture the data in such a manner that may be logged against batch information and, where full traceability is implemented in a given plant, the information may be used for more direct reporting to the supply chain and to customers.

Figure 3 shows the example of the display for the station where corrective action would take place. The project is to implement the recording process in electronic form in the manner illustrated. The operator at this station is to carry out the work detailing also the nature of the veterinary issue. Once the information is selected as marked "X", then the selection of the next action (bottom right of Figure 3) will allow the carcass to be released to a reject rail or back on to the main rail. The system would need to automatically handle the carcass to and from station C, with the operator only carrying out the corrective action task without the need to handle or push the carcass along the rail as is the case in many Australian plants. This would improve efficiency as well as the effectiveness of the process with proper recording of the reasons for pathological or non-pathological arrest of carcass for corrective action.

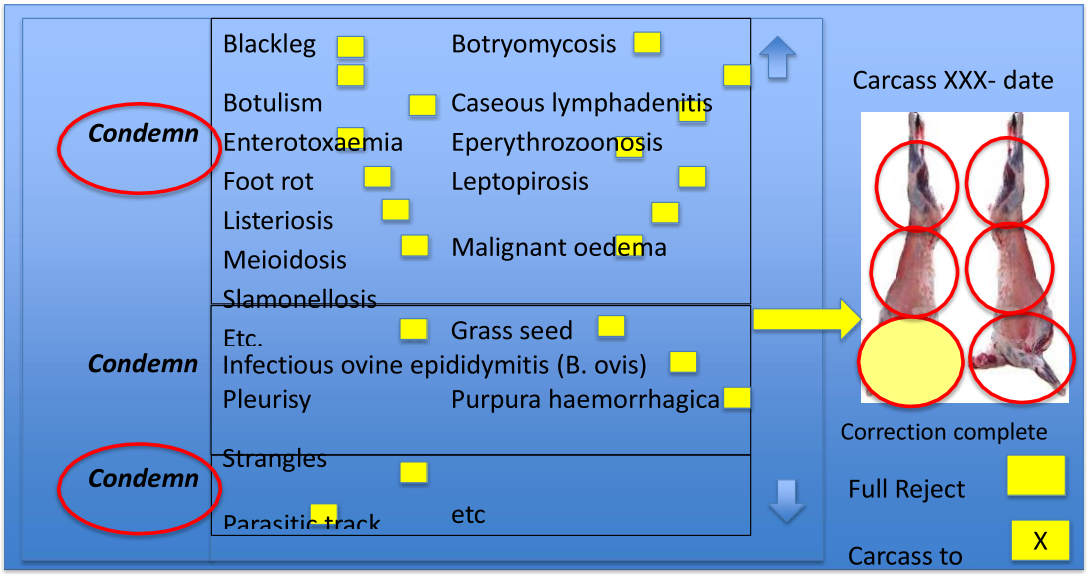


Figure 3: Display at corrective action station position C Figure 1, updated for each carcass.

2. Scope summary

The steps in the total scope proposed, which will be detailed in greater depth under Milestone 2, would support the following process based on an IT and automatic carcass handling solution to be integrated into the dressing line:

1- Inspectors at positions A or B (Figure 1) make a selection on the screen reflecting the corrective action to be taken (e.g. Reject or condemn part of the carcass). Where it is necessary to condemn part of the carcass, the inspector may select the area needing attention by a touch on an image of the carcass on the screen. The intention is that there would be a single screen touch as a replacement of the current switch used in existing plants to reject the carcass. The selection on the screen (Figure 2) which replaces the switch would result in the following subsequent steps:

i. A diver mechanism on the rail would divert and automatically transfer the assessed carcass if it is to be detained to the retain rail. When a carcass has passed inspection, the carcass would simply travel on and it would not be necessary for any specific actions to be taken by the inspector as this would be part of the intelligence of chain to recognise that the carcass passing the inspector was not rejected.

ii. The system would automatically track the count of "healthy" carcasses and the inspector would not be required to make any declarations on the screen. The system would log the information against the batch being processed.

iii. In the event the carcass is retained, there would be a time window for the inspector to touch the appropriate icon on the screen and the carcass would automatically divert to the detain rail.

iv. The carcasses automatically on the retain rail would travel forward with correct spacing until the leading carcass reaches a waiting point immediately before station C (Figure 1) for corrective action. The retain rail requires intelligent control (which needs to be implemented as part of the project) to ensure that the carcasses are correctly marshalled though the corrective action station.

2- When the corrective action station C, Figure 1, is clear, the waiting carcass would automatically arrive at this station and the display (Figure 3) would update with the information for the corresponding carcass that has just arrived. The carcasses in the queue would step forward to fill the gap at the waiting point before station C. The IT architecture needs to support the buffering of the information from the point of inspection to the station C, allowing for the proper tracking and also recovery in the event of power loss or system failure.

3- Once the corrective action is performed, the operator at station C is required to select the reason for the carcass having been retained. The selection is highlighted by an "X" when the appropriate displayed box against the description of the problem is touched as illustrated in Figure 3.

4- When the reason to retain the carcass or the nature of the problem has been identified, the screen would enable the selection of the buttons that allow the carcass to index on to a reject point or to a queue position on the rail awaiting a gap in the main dressing line for the carcass to join return to the main chain. Queuing is needed before station C and before the last position in the retain rail at the merge point to the main dressing line. This ensures appropriate flow.

5- The Knowledge Acquisition system is to record the data for each carcass.

There is also a need for a reporting platform structuring information collection and formatting the veterinary inspection results. Reporting software that presents the information according to the user application is required.

The simplest form of record would be carcass data by date and numbers, listing the information as logged during the assessment and corrective action stages of processing in the production shift.

The IT solution for such a system may use standard software, and such software would be evaluated or implemented as appropriate once the scoping task is completed under Milestone

3. Industry verification of the need

It was agreed that during this first milestone, industry consultation would be arranged to validate the broader needs and the standing of the project. During a special networking meeting of Meat Inspectors and QAs, the project was presented to a wide group of user representatives.

The records of the meeting independently documented by MINTRAC (see Appendix A- PDF file MINTRAC Minutes of meeting section 2, part 2 of presentation) provide recorded confirmation of the need and importance of this project to the industry.

The scope and approach to the project was presented at the meeting and those representing industry, food authorities and other experts showed considerable interest and support for the project.

During the months since the scoping work has been contracted, a number of companies including Marel and CSB have been consulted with respect to the software features required and in the execution of Milestone 2, further consultations will be conducted including in relation to iLeader, Cedar Creek, Marel traceability software and CSB IT solutions for the meat industry. To date the required system software for the intended solution for project has not been identified. It is likely that a specific implementation integrated with the automatic carcass handling control software of the retain rail will be required.

The next step after this project will be to research and develop a system of on-line data acquisition of the inspection, rejection, correction and quality control procedures including traceability from the start of the evisceration process, post pelt removal to the point of carcass inspection at the FSMA station, which is to be positioned at the end of the dressing

line. Once the system has been piloted for day to day use, follow up project would include evaluation KPI benchmarks comparing processes and practices and their tangible/intangible returns to the meat businesses.

4. Concluding Remarks

The preliminary scoping of the project has examined the requirements and overall scope for the work intended in the contract. The document here describes the approach and the next milestone will provide refinements and structured details of the full scope.

Industry wide consultation has been achieved independently and recorded accordingly.

Once Go-No Go decision from the MLA is a confirmed GO, the results under the next milestone will be reported with a more elaborated proposal for implementation of a pilot at a participating plant, proving the usability of the system and its benefits for the progress and advancement of the Australian Meat sector.

KK- Finalised Nov 2013.