



final report

Project code: A.SCT.017
Prepared by: Ben Armstrong
VeriSign Australia Pty Ltd
Date submitted: August 2006

PUBLISHED BY
Meat & Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Sharing data on live animal and carcass measurements

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

This publication is published by Meat & Livestock Australia Limited ABN 39 081 678 364 (MLA). Care is taken to ensure the accuracy of the information contained in this publication. However MLA cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of MLA.

Contents

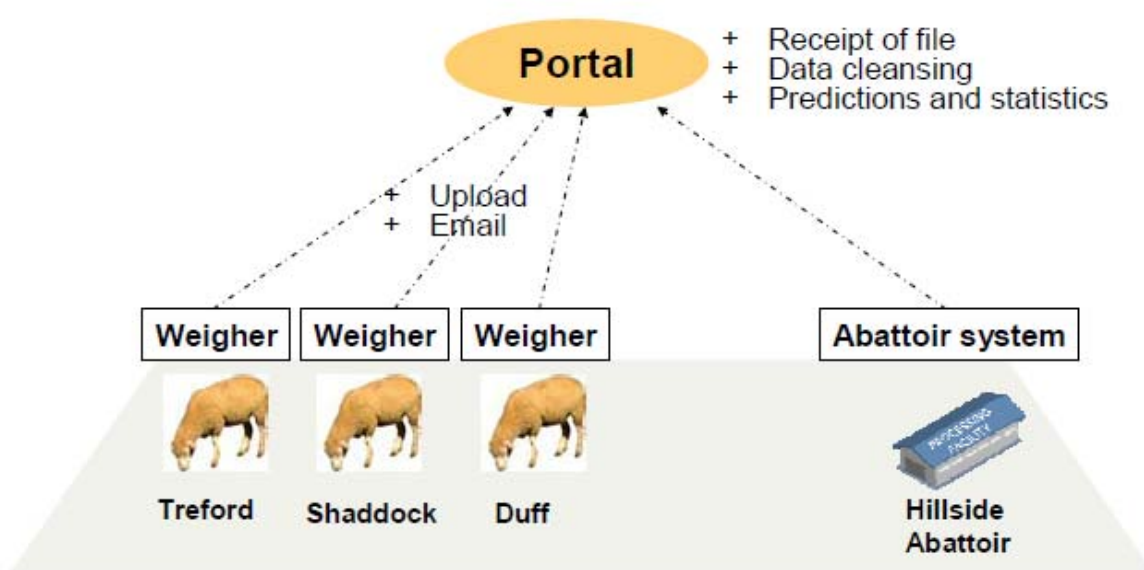
	Page
1 Overview.....	3
2 What was achieved.....	3
3 Lessons Learned and Recommendations.....	4
4 Conclusion	5
5 Annexure	6
5.1 Files received report	6
5.2 Welcome and Finishing Report.....	7
5.3 Individual Animal Report.....	7
5.3.1 On Farm.....	7
5.3.2 At Abattoir	8
5.4 Animal Observation Details Report	10

1 Overview

The purpose of the project was to develop a system for real-time data sharing between producers and abattoirs to facilitate better management, genetic selection, feedback and traceability of meat and animal products.

The project used walk on weighers, manual data collection and RFID readers installed at the Hillside abattoir to collect information about the identity and weight of sheep from several producer properties that supply the Hillside abattoir.

Figure 1 shows a diagrammatic representation of the project.



2 What was achieved

On completion of the related project SCT.005 the infrastructure to collect data from the abattoir was in place including placing RFID tags on gambrel hooks and the associated infrastructure to read the hooks as they passed several locations within the abattoir.

Several walk on weighers were deployed at the Treford and Shaddock farms by the Sheep CRC to collect live weight animal data and identity information.

Information was obtained from the abattoir system, the walk on weighers and other files and provided to VeriSign system within project SCT017 where the abattoir and on farm data were related to each other to show a near real time view of live animal growth rates and predicted finishing dates or the yield and finishing information of processed animals. Algorithms provided by the Sheep CRC were used to filter out erroneous data and also to perform predictions based on a linear growth model.

Tasks conducted for the project included:

- Several meetings to agree on the scope, progress of the project and the final review meeting
- Initial scoping and investigation of the solution

- Development of a Data Specification document detailing (data collection points, data formats, data frequency, report screens).
- Designing and implementing a hosted data sharing system and portal including embodying the algorithms of the Sheep CRC to provide forward looking estimates of finishing dates and predictive weights
- Building functionality to receive information from farms or abattoirs at a unique email address and automatically relating this to the correct farm and abattoir. The same functionality was built to enable the uploading of files should a person so wish.
- Producing multiple online reports for viewing data (see Attachment A for example screenshots and reports available)
- The processing of over 719 animals and 1693 hooks and 15,400 observations from the Hillside Abattoir, Treford and Shaddock farms.
- Collection of data from farm and abattoir

3 Lessons Learned and Recommendations

A number of lessons were learnt during the course of the project including:

Getting information from the farm or the abattoir

Information was not available as frequently as was expected to collect a large volume of viable data for further research and analysis. Approximately 20 files were received over the course of the project covering data from May to July. Making better business decisions about the management of animals is reliant on accurate data. Accurate data relies on frequent measurement and data collection. The process by which data was collected required manual intervention because of the need to double check abattoir data, and the need to dial in or visit the customer site to obtain data. Going forward we recommend that data is collected automatically without human intervention with the capacity for manual editing of the data after the fact.

Accuracy of Walk on Weigher data

The data obtained from walk on weighing often seemed to diverge from manual measurements taken at a similar time. There could be various reasons for this occurring including errors inherent in taking either measurement or even animal weight variances over a day. It is acknowledged that overall more frequent data collection will result in a more accurate picture of animal weight with time. We recommend further research is done in this area to ascertain the accuracy of walk on weighing devices compared to manual weighing and to educate the industry on the results.

Inconsistent data formats

The information collected from the farm was not in a consistent format. This meant that the system had to handle multiple different formats where the context of the information provided was not always clear. We recommend that a consistent data format standard is developed that software providers and walk on weigher manufacturers can configure their systems to provide a common data format by default.

Proper configuration and set up of RFID infrastructure

As data is being collected automatically it is very important that the system is configured and tested so that the right data is being recorded against the right animal or hook. This was a particular issue in the abattoir with the hook tags as more than one tag was in range of the reader at any one time. The system then needs to make sure it can determine the tag to which the data relates. This is particularly important at the abattoir because it is there that the tag on the animal is related to the tag on the gambrel to provide traceability. This issue also exists on farm as two or more animals can be in range of the reader. Another issue related to this is

configuring automatic collection devices to provide accurate dates and in the one date format. We recommend that a resource is available to help producers and the abattoir to ensure their remote data collecting devices are operational, correctly configured and tested.

Accuracy of predictions using cleansed data

The system developed performed predictions based both on the raw data received and also on a summary of that data cleaned using the Sheep CRC algorithms. It was originally believed that predictions based on summary data would be more accurate as they would exclude outliers. Anecdotal evidence showed that the more data points collected and used in the linear growth prediction the more accurate the resulting prediction. More research is recommended into whether it is necessary to screen data or just use all available data in the predictive model.

4 Conclusion

The project provided a means to gain a working knowledge of the issues inherent in automatic data collection and the complexities of dealing with different systems on farm and at abattoir. Much of the functionality required to implement an industry wide solution has now been built and some of the underlying concepts tested.

A number of issues were identified that we believe can be addressed to provide a robust system to enable industry wide traceability of animals but also allowing producers and abattoirs to gain better insight into their business and greater productivity from their animals.

The objective to provide proof of concept by developing a system for real-time data sharing between producers and abattoirs to facilitate better management, genetic selection, feedback and traceability of meat and animal products was achieved.

5 Annexure

The following reports are represented in this annexure:

1. Files Received Report
2. Welcome and Finishing Report
3. Individual Animal Report
4. Animal Observation Details Report

In all screens data that is underlined represents a link that will take the user to a further level of detail that is relevant in that context.

5.1 Files received report

This report shows the data a file was received, the number of unique animal IDs cited in that file, and the range of dates seen in that data file.



Hillside

[Home](#) [Animals](#) [Observations](#) [Log out](#)

More files

<u>Date Recieved</u>	<u>Animals Sighted</u>	<u>Date Range</u>
<u>2006/05/18 13:20 EST</u>	3	2006/04/26 23:36 to 2006/04/27 07:51 EST
<u>2006/05/18 10:51 EST</u>	3	2006/04/25 23:22 to 2006/04/26 13:48 EST
<u>2006/05/17 11:14 EST</u>	54	2006/04/23 23:26 to 2006/04/24 07:23 EST
<u>2006/05/15 10:03 EST</u>	82	2006/05/10 07:02 to 2006/05/11 02:07 EST
<u>2006/05/15 10:03 EST</u>	101	2006/05/07 14:45 to 2006/05/10 06:31 EST
<u>2006/05/15 10:03 EST</u>	54	2006/05/10 06:05 to 2006/05/10 06:42 EST
<u>2006/05/11 16:52 EST</u>	92	2006/05/03 07:20 to 2006/05/04 01:11 EST
<u>2006/05/11 16:36 EST</u>	92	2006/05/03 07:20 to 2006/05/04 01:11 EST
<u>2006/05/02 12:04 EST</u>	103	2006/04/26 04:32 to 2006/05/01 13:57 EST
<u>2006/04/12 14:20 EST</u>	65	2005/11/14 23:23 to 2005/12/04 23:26 EST
<u>2006/04/12 12:44 EST</u>	278	2005/10/29 00:36 to 2005/11/11 05:21 EST

5.2 Welcome and Finishing Report

This report depicts the five most recent files received as well as the number of animals that are predicted to reach the target weight (60kg) in a given number of weeks after the date the report was run. For example using the data below, there are 44 animals ready to be processed now, 2 will be ready in another week, 2 in two weeks time, etc.

Hillside

[Home](#) [Animals](#) [Observations](#) [Log out](#)

Welcome

Recent Files

Date Recieved	Animals Sighted	Date Range
2006/05/19 15:53 EST	3	2006/05/04 23:21 to 2006/05/05 06:39 EST
2006/05/19 15:53 EST	3	2006/05/03 23:27 to 2006/05/04 07:44 EST
2006/05/19 14:19 EST	3	2006/05/01 23:25 to 2006/05/02 07:32 EST
2006/05/19 12:11 EST	3	2006/04/30 23:27 to 2006/05/01 07:44 EST
2006/05/19 10:47 EST	3	2006/04/27 23:22 to 2006/04/28 05:46 EST

[More files >>](#)

Finishing Details

Weeks	0	1	2	3	4	5	6	7	8	9
Number	44	2	2	2	1	3	0	2	2	2

5.3 Individual Animal Report

This report shows information about a particular animal including the full history of weighing measurements taken. Depending on the current status of the animal (on farm or at abattoir) different information will be available to the user.

Calculated weights (where weights have been calculated based on a series of walk on weighing data over a period of time) are displayed in pink. The full data set which includes all observed instances of the animals can be seen by clicking on the raw data link.

5.3.1 On Farm

In the case of animals still on farm, information about the target weight, current growth rate and predictions about the animal's growth and readiness will be displayed. These calculated values will not be displayed unless there are enough records to make a statistical prediction.

5.3.2 At Abattoir

In the case of animals that have been slaughtered the dressing percentage, date of slaughter and carcass weight is displayed.

This report also shows the ability to track and trace data between the farm and abattoir.

On farm

On Farm Data	
EID:	982009102613041
Target Weight:	60 kg
<hr/>	
Current Growth Rate	128.23 grams/day
Target Weight Predicted date	2006-09-19
Predicted Weight - 1 Week:	44.98 kg
Predicted Weight - 4 Weeks:	47.68kg

[[Raw data](#)]

Location	Date and Time	Weight	Details	Type
Producer Stockyard	Thu May 18 04:19:00 EST 2006	45.0	View	Manual Weigh
Producer Stockyard	Wed May 10 13:50:00 EST 2006	45.0	View	Calculated (WOW)
Producer Stockyard	Wed May 10 06:06:00 EST 2006	41.0	View	Manual Weigh
Producer Stockyard	Sun May 07 23:17:00 EST 2006	38.0	View	Calculated (WOW)
Producer Stockyard	Wed May 03 07:36:00 EST 2006	47.0	View	Calculated (WOW)
Producer Stockyard	Fri Apr 28 14:17:00 EST 2006	42.0	View	Calculated (WOW)
Producer Stockyard	Thu Apr 27 10:45:00 EST 2006	40.0	View	Calculated (WOW)

At Abattoir

On Farm Data	
EID:	982009102065013
Target Weight:	60 kg
<hr/>	
Slaughter information	
Kill date:	Mon May 22 03:49:39 EST 2006
Carcass weight:	18.4
Dressing:	40.0%

[[Raw data](#)]

Location	Date and Time	Weight	Details	Type
Hillside Abattoir	Wed May 24 14:14:15 EST 2006	18.0	View	Manual Weigh
Producer Stockyard	Thu May 18 04:25:00 EST 2006	46.0	View	Manual Weigh
Producer Stockyard	Wed May 10 15:34:00 EST 2006	41.0	View	Calculated (WOW)
Producer Stockyard	Wed May 10 06:11:00 EST 2006	42.0	View	Manual Weigh
Producer Stockyard	Mon May 08 23:59:00 EST 2006	47.0	View	Calculated (WOW)
Producer Stockyard	Wed May 03 23:11:00 EST 2006	46.0	View	Calculated (WOW)
Producer Stockyard	Fri Apr 28 21:52:00 EST 2006	39.0	View	Calculated (WOW)
Producer Stockyard	Wed Apr 26 09:07:00 EST 2006	46.0	View	Calculated (WOW)

5.4 Animal Observation Details Report

The observation details report shows information about an individual animal recorded when a measurement occurred (e.g. at the abattoir or on farm). This report can be reached by clicking on the view link in the list of animal weights section in the Individual Animal Reports.

The information available in this report will depend on what information was recorded and sent to VeriSign. Depicted below is a typical data record for an animal.

Name	Value
Cat	E
Dent	8
HookPassTime	24/04/2006 03:01:49 PM
FatCl	2.0
FatDpth	10
vsuploadid	79
Grower	HIM
Cyp	M
bodynum	233
CTime	15:24
WtClass	22
RTAD	24/4/2006 3:23:13 PM
Lot	313
Sex	F
Dest	MX
Weight	21.1
Hook1num	E004010007933320
Wt	21.8
Date	4/24/2006 3:01:51 PM
Regrade	
Hook1Time	24/04/2006 03:01:51 PM