

final report

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Resource flock slaughter and meat science - 2013 drop progeny

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Executive summary

The purpose of this project was to manage the slaughter of lambs and yearlings from both Katanning and Kirby as part of the Sheep CRC and Meat and Livestock Resource Flock program. This project enabled the collection and measurement of a range of meat science phenotypes. From Katanning 596 lambs and from Kirby 941 were slaughtered over 2014. The sampling and laboratory analysis is complete and the data has been uploaded into the Sheep CRC database which Sheep Genetics can access.

Contents

1. Background	4
2. Project objectives	4
3. Methodology	4
4. Results and discussion	5
5. References	6
6. Acknowledgements	6

1. Background

The Sheep Industry has approved the establishment of 2 Resource Flocks located at Katanning (WA) and Kirby (NSW) to replace the original Information Nucleus Flocks. The purpose of these flocks is to underpin both traditional and genomic selection principles managed by Sheep Genetics, especially for hard to measure laboratory traits (or phenotypes) like meat yield, shear force tenderness, colour, Fe, Zn and intramuscular fat of lamb meat. In addition, the flocks are used for numerous other experiments such as testing the effects of stress on meat phenotypes and also for calibration of carcass and meat quality measurement devices.

The purpose of this project was to manage the slaughter of the 2013 drop lambs from the 2 Resource Flocks; collect meat samples and measure a range of meat science phenotypes, finally upload the data into the Sheep CRC database.

2. Project objectives

1. To slaughter the 2013 drop lambs and complete the meat science assessment of carcass quality including pH and colour measurements.
2. To complete all the laboratory measures for the 2013 drop lambs
3. To upload the data to the Information Nucleus website.

3. Methodology

Experimental design and slaughter details

The design of the Resource Flock is similar to the design of the Sheep CRC Information Nucleus (Fogarty et al 2008). Briefly, about 2000 lambs were produced from artificially inseminated matings to Merino and crossbred ewes located at 2 research sites across Australia (Katanning WA and Kirby NSW). The lambs were progeny of industry Terminal (Poll Dorset, Suffolk, Texel, White Suffolk), Maternal (Bond, Border Leicester, Coopworth, Corriedale, Dohne Merino, Prime SAMM) or Merino (Merino, Poll Merino) sires, representing the major production types in the Australian sheep industry. These sires were chosen to represent the full range of ASBVs for key traits within each sire type. Lambs were mainly maintained under extensive pasture grazing conditions, but were fed grain, hay or feedlot pellets when feed supply was limited at some sites (Ponnampalam et al., 2013). For each site lambs were assigned to smaller groups (kill groups) to be killed at the same day to enable carcass weight targets to be achieved. Lambs were yarded the day before slaughter, held for 6 hours and then weighed and transported to either WAMMCO Katanning or TFI Tamworth for slaughter, where they were held in lairage overnight and slaughtered the following day at an average carcass weight of 22.9 kg (StDev = 3.87). All carcasses were subjected to a medium voltage electrical stimulation (Pearce et al., 2010) and trimmed according to AUS-MEAT specifications (Anonymous, 2005). Carcasses were chilled overnight (3 - 4°C) before sampling. All lambs were measured and sampled for a wide range of live animal, carcass, meat and growth traits. The dates and number of head slaughtered for the two sites is listed in Table 1.

Carcass measurements and sample collection

Hot carcass weight was measured straight after slaughter. At 24 h post-mortem, the pH was measured on the left portion of the *longissimus thoracis et lumborum* muscle and pH measurements are described by Pearce et al. (2010).

From the carcass saddle region (cut between the 12th and 13th ribs), the shortloin (AUS-MEAT 4880) (Anonymous, 2005) component was removed. From this, the entire *longissimus lumborum* muscle without subcutaneous fat (shortloin muscle; referred as 'loin' muscle) (up to the 12th rib) was prepared. The trimmed subcutaneous loin fat was also weighed (shortloin fat weight), and the epimysium (silver skin) was removed. Samples were then taken for intramuscular fat, minerals, shear force and retail colour. The shear force and retail colour loin samples were individually vacuum packed, and stored at 2°C to age for 5 days. The Intramuscular fat and mineral samples were frozen within 2 days of slaughter and freeze dried prior to analysis.

Intramuscular fat, shear force, minerals and retail colour measurement

The intramuscular fat, shear force, minerals and retail colour assessment were completed according to the methods detailed in Pearce (2010).

4. Results and discussion

The project has successfully completed slaughter and carcass measurements for 2013 drop lambs at the Katanning and Kirby Resource Flock sites as shown in Table 1. All laboratory measures have been completed and the data uploaded into the Sheep CRC Resource Flock dataset where it is then accessible by Sheep Genetics.

Table 1. Slaughter numbers, Hot Carcass Weight, Shear Force and pH6Temp of the Katanning and Kirby Resource Flock lamb slaughters.

	No Head	Average HCWT (kg)	Average Shear Force 5d (N)	pH6temp (oC)
Kirby				
23/06/2014	198	26.1	37.8	25.2
28/07/2014	297	23.8	29.4	26.7
18/08/2014	194	23.3	33.0	14.2
10/09/2014	175	22.5	27.1	29.1
5/11/2014	77	23.7	25.9	29.2
	941	23.9 (16.4-39.2)	31.2 (16.6-81.5)	24.3 (1.1-38.9)
Katanning				
11/03/2014	289	21.2	31.6	19.8
12/05/2014	129	21.8	35.6	18.8
15/07/2014	178	19.8	29.0	15.6
	596	20.8 (12.8-32.7)	31.6 (18.6-84.5)	17.2 (2.6-31.5)
Grand Total/Average	1537	22.8	31.4	22.3

5. References

Pearce, K. L. (Ed.). (2011). Sheep CRC program 3: Next generation meat quality project 3.1. Phenotyping the Information Nucleus (2nd ed.) CRC for Sheep Industry Innovation. Publ. Murdoch University

6. Acknowledgements

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