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Producer Research Support

Maximum Eye Muscle

Poll Dorset Association WA Branch

The WA branch of the Poll Dorset Association insitgated a project to identify the breeding drivers that will maximise eye muscle in the carcases of Poll Dorset sired lambs.

A significantly deeper eye muscle in lambs scanned live, did not appear to translate to a significantly higher retail meat yield, even in the loin and rack cuts, which are comprised of eye muscle.

Key points

- A 2.3 millimetre difference between sire EBVs for post weaning eye muscle depth did not result in a significant difference in the growth rate or carcase performance of their progeny.
- A significantly deeper eye muscle in lambs scanned live, did not appear to translate to a significantly higher retail meat yield, even in the loin and rack cuts which are comprised of eye muscle.

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The project

The WA branch of the Poll Dorset Association insitgated Project MAXEM (Maximum Eye Muscle), to identify the breeding drivers that maximise eye muscle in the carcases of Poll Dorset sired lambs. The project was intended to understand the relationship of EMA (expressed as raw data), or LAMBPLAN EBV, to carcase yield.

Through collaborative research with Murdoch University, MAXEM also intended to investigate the eating quality of high and low EMA yield carcases.

Objectives

1. Demonstrate the difference in carcase yield (measured by ViaScan), between progeny groups with sires carrying equal raw data EMA measurements, but differing (high and low) EBVs for EMA;
2. Active involvement from at least 30 group members and their clients, to build awareness of the project outside the group;
3. Build working relationship with WAMMCO (access of ViaScan), to establish market alliances;
4. Collaboration with industry researchers; and
5. Deliver project outcomes to industry through a range of media-related activities - press releases, sponsorships, field days, seminars and newsletters.

What was done

The project was carried out on two commercial properties – one at Shackleton in the north and another at Broomehill in the south. The trial involved joining Merino ewes to Poll Dorset rams, grouped according to their EBV classification for EMD. The rams selected for use on the trial sites met the following specification:

1. Accuracy figures of greater than 50%;
2. Current weight and scan data;
3. Similar EBVs for fat and post weaning growth; and
4. Equal to, or greater than, average breed growth.

The progeny from the high and low mating groups at each site were then assessed for lean meat yield.

Ram Selection

Rams in the high muscle group were selected to have post weaning EBVs for EMD above one, while those in the low muscle group had scores of less than one.

Rams selected for use at both sites were kept together until they were ready for joining. An outbreak of brucellosis affected the rams destined for both locations. The rams used at Shackleton may have been infected with brucellosis, and the selection of rams for Broomehill was made later and from a reduced gene pool.

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Producer Research Support

MLA Producer Research Support offers support funding of up to $15,000 over three years for groups of producers keen to be active in on-farm research and demonstration trials.

These activities include:

- Producer Initiated Research and Development
- More Beef from Pastures demonstration trials
- Prime Time Wean More Lambs demonstration trials
- Sustainable and productive grazing grants.

Contact Stephen Feighan - MLA Project Manager, Producer Delivery and Adoption.

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Ewe Management

At each of the trial locations, teasers were put in with 400 ewes at one percent. At Shackleton, the ewes were three and a half years old, while at Broomehill they were mixed age ewes with strong wool. The ewes were randomly split into two groups and syndicate mated to either the high or low rams at two percent. After a joining period of seven weeks, the rams were removed, and the ewes run as one flock.

A few days before lambing, the ewes were drafted into their high and low groups and put in paddocks of similar history. At Shackleton, a poor season with minimal pasture meant that supplementary feeding and management was necessary to ensure ewes were properly nourished during pregnancy and early lactation.

Shackleton lambs were tagged, weighed, tailed, vaccinated and the males castrated in June. After marking, the two groups of ewes and lambs were again combined. The lambs were weighed monthly until October, then slaughtered.

Broomehill lambs were weighed monthly until November, when 93 lambs were consigned to slaughter. The remaining 330 lambs were turned onto lucerne, to be finished for sale the following autumn.

Lamb Weights, Growth Rates and Live Scanning Data

Lamb weights were collected by individual tag numbers, which enabled individual growth rates to be calculated. Only lambs recorded for both the start and finish of a period were included in the growth rate figures. This avoided growth rate data being biased by light lambs that did not survive.

Lambs at the Broomehill site were scanned for fat and eye muscle depth by ultrasound. Some lambs were still too small and light for accurate measurements to be made and therefore information was only recorded for 276 lambs.

Lamb Meat Yield Information

Meat yield differences between the high and low trial lamb muscle groups were to be measured using Viascan. This did not eventuate, so the group decided to use boned out muscle weights instead. Because of cost constraints, only the loin, rack and leg cuts were boned out and recorded individually, which greatly reduced the scope and quality of results collected.

Lamb Slaughter - Shackleton

Meat yield differences between the high and low trial lamb muscle groups were to be measured using Viascan. This did not eventuate, so the group decided to use boned out muscle weights instead. Because of cost constraints, only the loin, rack and leg cuts were boned out and recorded individually, which greatly reduced the scope and quality of results collected. Only one draft of Broomehill lambs was slaughtered. The rest were sold for live export, without recording any further information.

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MLA also recommends

Sheep Genetics Australia

Sheep Genetics Australia (SGA) is the national genetic evaluation service for the Australian sheep industry. It is built around the world's most comprehensive sheep genetics database, and will deliver genetic information on a fee-for-service basis.

Tel (02) 6773 2493 or
www.sheepgentics.org.au

EDGEnetwork

EDGEnetwork offers practical field-based workshops to improve productivity and profitability for the long-term.

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Call MLA on 1800 993 343 or
www.edgenetwork.com.au

What happened?

Lambing Percentages

The lambing percentages for high and low groups at both sites are shown in Table 1.

Table 1.Lambing Percentages

		Number of ewes	Number of lambs	Lamb marking %
Shackleton	High	194	167	83.5
	Low	190	135	67.5
Broomehill	High	189	215	106.5
	Low	194	213	105.5

The difference in lambing percentages was attributed to large lamb losses at Shackleton because of the harsh conditions that season. The outbreak of brucellosis may have impaired fertility of infected rams at Shackleton. There were very few twins in either group.

Lamb Liveweights

In all except one weighing, the lambs from the high group at both sites were slightly heavier than the lambs from the low group. These results are consistent with similar ram EBVs for growth between the groups, and suggest that all ewes were similarly nourished before lambing.

Lamb Growth Rates

Lambs from the high groups grew slightly faster than low group lambs, but differences were not statistically significant.

Live Ultrasound Measurements

When the lambs at Broomehill were scanned by ultrasound, high group lambs had significantly deeper eye muscles than low group lambs. Differences in liveweight and fat depth were negligible. The difference in eye muscle depth was higher than predicted by Lambplan, but does confirm that differences in sire EBV for EMD are passed on to progeny.

Carcase Weight

Shackleton

As lambs were drafted for slaughter based on live weight, significant differences in live weight and carcase weight were not expected. While the lambs from the high group were heavier for both these attributes, the differences were not significant. The heavier carcase weights had a slightly higher dressing percentage, but not significantly different.

For the three cuts measured, the lambs in the high group had slightly (but not significantly) heavier retail meat yields than the low group. When the loin and rack cuts were combined to give a total backstrap yield, then there was a 25 gram per side advantage to the high group which was almost significant. The selection of sires based on EBVs for eye muscle depth appeared to have a greater influence on the retail meat yield from the two cuts comprised of eye muscle than on the meat yield from the leg in their progeny.

There was no difference in pre slaughter live weights between the two groups in the final draft of lambs sent for slaughter from Shackleton. Contrary to expectations, lambs from the low group had a 0.5 kilogram heavier carcase weight and a dressing percentage 1.5 higher than lambs from the high group.

These results should be considered cautiously because they were the last lambs slaughtered and the results were interpreted from kill sheets, rather than having individual carcase weights identified by tag to calculate dressing percentages.

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Broomehill

There were no significant differences between the groups in live weight, carcase weight or dressing percentage, although the low group had a slight advantage over the high group for all three attributes.

Lambs from this consignment were fat scored live on farm before being sent to slaughter. Some lambs which met the weight requirements for slaughter were not sent because they were not quite finished. Dropping more of these lighter, less finished lambs from the low group consignment, may have contributed to the low group having slightly higher live and carcase weights.

There was no difference in GR tissue depth between groups with all but two lambs in the high group being scored two. Because lambs were quite lean at slaughter, their ability to express their genetic disposition to lay down muscle may have been hampered.

Discussion

There were no significant differences between groups in lamb live weights or lamb growth rates at either site. This is consistent with the lack of difference in the sire EBVs for PWT between the groups.

Lambs in the high muscle group at Broomehill had 1.56 millimetre deeper eye muscle than lambs in the low group when scanned live at an average weight of 40.85 kg. This was even greater than the difference predicted by Lambplan.

In the second consignment of lambs from Shackleton, the lambs in the high group were on average 1.5 millimetres fatter at the GR site than lambs in the low group, which is also higher than Lambplan predictions.

No significant differences between groups were seen in the retail meat yield of the easy carve leg, eye of short loin and french rack cuts when they were measured at one slaughter from each site.

Lambs from the high muscle group tended to have slightly heavier loin and rack cuts than lambs from the low muscle group, while sire selection based on EMD tended to have a smaller influence on the retail weight of the leg cut. A significantly deeper eye muscle in lambs scanned live, did not appear to translate to a significantly higher retail meat yield, even in the loin and rack cuts which are comprised of eye muscle.

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