



Romney New Zealand Saleable Yield Project 2007-2008

Sponsored by Merial Ancare

Growth and Carcass Results from the South Island Progeny Test

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Introduction

The purpose of the Romney New Zealand Merial Ancare saleable meat yield trial is to identify superior dual purpose sires that have improved growth characteristics and have higher saleable meat yield value than their contemporaries.

The 2007/2008 Romney New Zealand saleable meat yield trial was run on John Jackson's property in the North Island and Hugh Taylor's property in the South Island. Both farmers have supplied their property and time free of any charges and without their support this trial would have been more costly and beyond the means of Romney New Zealand to run. The very generous support that Merial Ancare gave for the trial is also appreciated. Due to the ongoing drought that is plaguing the Wairarapa insufficient lambs were generated on John Jackson's property to warrant collection of data. Therefore this report only covers the results from the South Island site.

The ewe lambs are being retained in the trial to investigate maternal traits; these maternal traits will not be considered in this report. Ewe lamb information was, therefore, only used when considering birth weight and weaning weight.

One of the overall aims is to provide linkages between the sites and years to enable ongoing global analysis of the data. To date, we have one link sire between years for the South Island trial and will process this data over the next month

This report summarises the results of the progeny test for liveweight traits, and carcass traits. Lamb survival data was also collected but will be presented separately as will be the hogget oestrus data, which was recorded for the 2006 sire groups. In addition work has been done on incidence and effect of pleurisy on lamb growth rate.

Summary of the South Island Data Collection

- A total of 13 sires were used
- Each sire was mated to 60 ewes via single sire mating
- All ewes were scanned and dry ewes removed
- Ewes were single sire lambed, with all lambs identified at birth and weighed
- Unlike last years trial a draft of lambs was not taken at weaning
- Weaning took place 7th December
- There were three slaughter drafts on 15th January, 31st January and 21st February
- Lambs were slaughtered at Alliance Smithfield, Timaru; all lambs were assessed using ViaScan which estimates the lean meat yield in the leg, loin and shoulder regions

- pH was measured on all lambs and further meat quality work is being carried out on the loins (data will be generated in April)

Birth Weight

The overall average for birth weight was 5.1kg, with a range of 0.6kg in the breeding values. The birth weight data was adjusted for sex, birth rearing rank and date of birth. The majority of sires had progeny with similar birth weights. No interpretation will be made as to which sire is the best given that we have also collected cause of death and in this trial lamb weight was not seen as a limitation to lamb survival, except where birth weights were very light.

Table 1: Breeding Values and Predicted Progeny Means for Birth Weight (kg)

	Number of Lambs	Breeding Value	Predicted Progeny Mean
Fernvale 1106.02	89	0.31	5.3
Armidale 208.05	85	0.23	5.3
Sudeley 181.06	78	0.23	5.2
Ram Hill 1264.03	88	0.22	5.2
	86	0.12	5.2
	93	0.01	5.1
	93	0.00	5.1
	76	-0.08	5.1
	82	-0.10	5.1
	75	-0.15	5.0
	92	-0.24	5.0
	93	-0.25	5.0
	95	-0.31	4.9

Weaning Weight

The overall average for weaning weight was 30.4kg, with a range of 3kg in the breeding values. The weaning weight data was adjusted for sex, birth rearing rank and age at weaning. The majority of sires had progeny with similar weaning weights. Fernvale 1106.02 and Ram Hill 1264.03 were the stand out sires.

Table 2: Breeding Values and Predicted Progeny Means for Weaning Weight (kg)

	Breeding Value	Predicted Progeny Mean
Fernvale 1106.02	1.42	31.1
Ram Hill 1264.03	1.23	31.0
Tamlet 726.02	0.71	30.8
Sudeley 181.06	0.70	30.7
	0.51	30.7
	0.19	30.5
	-0.03	30.4
	-0.18	30.3
	-0.34	30.2
	-0.51	30.1
	-0.55	30.1
	-1.43	29.7
	-1.71	29.5

Age at Drafting

The overall average for age at drafting was 154 days, with only a small range of nearly one day's difference in the breeding values. The Total difference in mean age to draft before correction was 8 days. Only ram lambs were assessed for this trait. The age at drafting data was adjusted for birth rearing rank and date of birth. There were no significant differences between sires. This is in part due to the fact that only 3 drafts were carried at 2-3 week intervals and so does not actually reflect the time at which the slaughter weight target was actually achieved, for example a lamb may have reached the target weight 2 days after the last kill, but its age at drafting is extended.

Table 3: Breeding Values and Predicted Progeny Means for Age at Drafting (days)

	Breeding Value	Predicted Progeny Mean
Tamlet 726.02	-0.36	153.8
Ram Hill 1264.03	-0.33	153.8
Annan Downs 180.04	-0.21	153.9
Doughboy 41.06	-0.17	153.9
	-0.09	154.0
	-0.01	154.0
	-0.01	154.0
	0.08	154.0
	0.12	154.1
	0.13	154.1
	0.21	154.1
	0.28	154.1
	0.36	154.2

The number of lambs per sire per draft is given in Table 4, with the % of lambs from each sire that made it into the first draft also given, there was a range of 11.4 to 37.5%.

Table 4: Number of Progeny Per Sire in Each Kill and % of Progeny Per Sire in the First Draft (made 15th January 2008)

	No. 1st Draft	No. 2nd Draft	No. 3rd Draft	Total	% 1st Draft
Ram Hill 1264.03	15	15	10	40	37.5
Sudeley 181.06	10	14	9	33	30.3
Tamlet 726.02	8	19	6	33	24.2
Glenleith 28.05	8	21	7	36	22.2
	8	19	13	40	20.0
	7	16	12	35	20.0
	7	19	11	37	18.9
	5	17	7	29	17.2
	6	21	11	38	15.8
	6	16	17	39	15.4
	5	23	10	38	13.2
	5	21	16	42	11.9
	5	19	20	44	11.4

Liveweight at Slaughter

The overall average for liveweight at slaughter was 40.4kg, with a range of nearly 2kg in the breeding values. Only ram lambs were assessed for this trait. Liveweight at slaughter data was adjusted for birth rearing rank and slaughter group. There were no significant differences between sires. This was somewhat expected in that all progeny were drafted off based on a minimum liveweight.

Table 5: Breeding Values and Predicted Progeny Means for Liveweight at Slaughter (kg)

	Breeding Value	Predicted Progeny Mean
Fernvale 1106.02	1.11	41.6
Glenleith 28.05	0.55	41.3
Clifton Downs 497.04	0.43	41.2
Sudeley 181.06	0.39	41.2
	0.22	41.1
	-0.02	41.0
	-0.06	41.0
	-0.12	40.9
	-0.14	40.9
	-0.42	40.8
	-0.54	40.7
	-0.69	40.7
	-0.70	40.6

Carcass Weight

The overall average for carcass weight was 16.6kg, with a range of nearly 2kg in the breeding values. Only ram lambs were assessed for this trait. Carcass weight data was adjusted for birth rearing rank and slaughter group. Sire Fernvale 1106.02 produced lambs with heavier carcasses, which would have been in part due to his progeny having slightly higher liveweights at slaughter, but as is shown below differences in carcass weight are also due to differences in Dressing Out %.

Table 6: Breeding Values and Predicted Progeny Means for Carcass Weight (kg)

	Breeding Value	Predicted Progeny Mean
Fernvale 1106.02	1.02	17.6
Glenleith 28.05	0.37	17.0
Gatton Park 29.06	0.25	16.9
Tamlet 726.02	0.21	16.8
	0.04	16.6
	0.03	16.6
	-0.05	16.6
	-0.06	16.5
	-0.18	16.4
	-0.18	16.4
	-0.24	16.4
	-0.58	16.0
	-0.63	16.0

Dressing Out %

Dressing Out % is the ratio between carcass weight and liveweight. A higher dressing DO% means that lambs can be slaughtered at a lighter liveweight yet still achieve a set carcass weight. The overall average for Dressing Out % was 40.4%, with a range of nearly 2.5% in the breeding values. Only ram lambs were assessed for this trait. Dressing out % data was adjusted for birth rearing rank and slaughter group. Sires Gatton Park 29.06 and Fernvale 1106.02 produced lambs with stand out DO%.

Table 7: Breeding Values and Predicted Progeny Means for Dressing Out % (Carcass Weight/Liveweight) (%)

	Breeding Value	Predicted Progeny Mean
Gatton Park 29.06	1.41	42.4
Fernvale 1106.02	1.02	42.0
Tamlet 726.02	0.64	41.6
Annan Downs 180.04	0.42	41.4
	0.11	41.1
	0.10	41.1
	0.00	41.0
	-0.51	40.5
	-0.52	40.5
	-0.54	40.5
	-0.58	40.4
	-0.65	40.4
	-0.90	40.1

GR

GR is measure of fat 11cm from the midline on the 12th rib, and has traditionally been used by meat companies to grade lambs for payment. The overall average for GR was 4.7mm, with a range of nearly 2mm in breeding values. Only ram lambs were assessed for this trait. GR data was adjusted for birth rearing rank, slaughter group and carcass weight. Several sires produced lambs with lower GRs.

Table 8: Breeding Values and Predicted Progeny Means for GR

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	-0.94	4.2
Clifton Downs 497.04	-0.58	4.4
Armidale 208.05	-0.65	4.4
Glenleith 28.05	-0.41	4.5
	-0.23	4.6
	0.07	4.7
	0.25	4.8
	0.24	4.8
	0.21	4.8
	0.20	4.8
	0.30	4.9
	0.54	5.0
	1.00	5.2

ViaScan measured GR

The ViaScan imaging system also estimates fat depth on the carcass. The overall average for GR was 3.5mm, with a range of nearly 1.5mm in breeding values. Only ram lambs were assessed for this trait. ViaScan GR data was adjusted for birth rearing rank, slaughter group and carcass weight. There was no significant difference between sires for this trait, however, the general ordering was similar as for the actual GR measurement.

Table 9: Breeding Values and Predicted Progeny Means for ViaScan measured GR

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	-0.59	3.2
Ram Hill 1264.03	-0.62	3.2
Hermiston 67.05	-0.30	3.3
Glenleith 28.05	-0.46	3.3
	-0.11	3.4
	-0.13	3.4
	-0.13	3.4
	-0.25	3.4
	0.48	3.7
	0.46	3.7
	0.37	3.7
	0.53	3.8
	0.76	3.9

Lean Meat Yield in the Leg as Assessed by ViaScan

The overall average for leg lean yield was 21.6%, with a range of 1.2% in breeding values. Only ram lambs were assessed for this trait. Leg lean yield data was adjusted for birth rearing rank, slaughter group and carcass weight. Sire Merrydowns 894.05 was the stand out sire. The industry average is 20.4%, so all sires averaged above this value. The % of lambs per sire reaching the Alliance premium targets for this trait are in Table 14.

Table 10: Breeding Values and Predicted Progeny Means for Lean Meat Yield in the Leg as Assessed by ViaScan (%)

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	0.70	21.9
Doughboy 41.06	0.44	21.8
Ram Hill 1264.03	0.30	21.7
Clifton Downs 497.04	0.19	21.7
	0.18	21.7
	0.07	21.6
	0.02	21.6
	-0.13	21.5
	-0.22	21.5
	-0.29	21.5
	-0.35	21.4
	-0.36	21.4
	-0.54	21.3

Lean Meat Yield in the Loin as Assessed by ViaScan

The overall average for loin lean yield was 14.6%, with a range of nearly 1% in breeding values. Only ram lambs were assessed for this trait. Loin lean yield data was adjusted for birth rearing rank, slaughter group and carcass weight. All sires produced similar lambs. The industry average is 14.04%, so all sires averaged above this value. The % of lambs per sire reaching the Alliance premium targets for this trait are in Table 14.

Table 11: Breeding Values and Predicted Progeny Means for Lean Meat Yield in the Loin as Assessed by ViaScan (%)

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	0.35	14.8
Doughboy 41.06	0.32	14.8
Armidale 208.05	0.13	14.7
Totaranui 367.03	0.10	14.7
	0.07	14.6
	0.05	14.6
	0.02	14.6
	-0.02	14.6
	-0.06	14.6
	-0.07	14.6
	-0.22	14.5
	-0.34	14.4
	-0.34	14.4

Lean Meat Yield in the Shoulder as Assessed by ViaScan

The overall average for shoulder lean yield was 17.0%, with a range of nearly 1.5% in breeding values. Only ram lambs were assessed for this trait. Shoulder lean yield data was adjusted for birth rearing rank, slaughter group and carcass weight. Sire Merrydowns 894.05 was the stand out sire. The industry average is 17.17%, so most sires averaged below this value. The % of lambs per sire reaching the Alliance premium targets for this trait are in Table 14.

Table 12: Breeding Values and Predicted Progeny Means for Lean Meat Yield in the Shoulder as Assessed by ViaScan (%)

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	0.96	17.5
Doughboy 41.06	0.37	17.2
Armidale 208.05	0.12	17.1
Annan Downs 180.04	0.10	17.0
	0.04	17.0
	0.00	17.0
	-0.02	17.0
	-0.13	16.9
	-0.15	16.9
	-0.26	16.9
	-0.26	16.9
	-0.29	16.9
	-0.47	16.8

Lean Meat Yield in the Total Carcass as Assessed by ViaScan

The overall average for carcass lean yield was 53.1%, with a range of 3% in breeding values. Only ram lambs were assessed for this trait. Carcass lean yield data was adjusted for birth rearing rank, slaughter group and carcass weight. Sire Merrydowns 894.05 was the stand out sire. The industry average is 51.61%, so all sires averaged above this value.

Table 13: Breeding Values and Predicted Progeny Means for Total Carcass Lean Meat Yield as Assessed by ViaScan (%)

	Breeding Value	Predicted Progeny Mean
Merrydowns 894.05	2.04	54.1
Doughboy 41.06	1.20	53.7
Armidale 208.05	0.28	53.2
Clifton Downs 497.04	0.18	53.2
	0.16	53.2
	0.10	53.1
	0.03	53.1
	-0.24	53.0
	-0.35	52.9
	-0.50	52.8
	-0.76	52.7
	-0.88	52.7
	-1.25	52.5

% of Lambs Reaching Alliance Premium Targets

Alliance set yield targets, whereby if 80% or more of lambs from a given property over the season achieve the targets for EACH region a premium will be retrospectively awarded. Only lambs from sire Merrydowns 894.05 would have been eligible for the premium. In many instances, although over 80% of the progeny of some sires were reaching the targets for individual regions of the carcass, the same progeny were not achieving the targets for other cuts, meaning that overall they did not qualify for the premiums, as the targets must be achieved for each region. On the whole the best results were achieved for the loin region.

A curious observation is that nearly 71% of Glenleith 28.05s progeny achieved the targets, yet this sire did not stand out for any of the averages for the % yields. The reason for this is that the % reaching the target is actually related not only to the average of the progeny for the sire, but the amount of variation or range for progeny of the sire. In the case of Glenleith 28.05, although the average of his progeny was low there was actually a lot of variation in his progeny such that a good proportion of them were over the targets, but there were a few really light yielding lambs for this sire which pulled down the average.

Table 14: % of Progeny per Sire Reaching the Alliance Premium Targets for Lean Meat Yield independently for the Leg, Loin and Shoulder and for All Three Regions

	% Leg Target	% Loin Target	% Shoulder Target	% All Three Regions Target
Merrydowns 894.05	91.2	94.1	91.2	88.2
Armidale 208.05	83.8	100.0	86.5	78.4
Glenleith 28.05	80.0	91.4	82.9	71.4
Doughboy 41.06	90.0	95.0	80.0	70.0
	72.4	89.7	89.7	69.0
	80.0	88.6	71.4	65.7
	83.8	86.5	75.7	64.9
	73.0	94.6	73.0	62.2
	76.5	85.3	76.5	61.8
	71.4	82.9	65.7	57.1
	70.0	90.0	56.7	53.3
	65.6	71.9	78.1	50.0
	66.7	90.5	61.9	50.0

Thresholds for premiums: Leg \geq 20.7%; Loin \geq 13.5% and Shoulder \geq 16.4%. To qualify for the premium 80% of lambs within a line must reach the targets for all three regions.

pH

The overall average for loin lean yield was 5.72, with a range of nearly 0.1 in breeding values. Only ram lambs were assessed for this trait. pH data was adjusted for birth rearing rank, slaughter group and carcass weight. Sires Fernvale 1106.02 and Glenleith 28.05 produced lambs with the lowest pH. Optimum pH is between values 5.5 and 5.7. The % of lambs per sire with high pH (greater than 5.9) is in Table 16.

Table 15: Breeding Values and Predicted Progeny Means for pH Measured at 24 hours in the works

	Breeding Value	Predicted Progeny Mean
Fernvale 1106.02	-0.05	5.70
Glenleith 28.05	-0.03	5.70
Annan Downs 180.04	-0.01	5.71
Totaranui 367.03	-0.01	5.72
	-0.01	5.72
	-0.01	5.72
	0.00	5.72
	0.01	5.72
	0.01	5.73
	0.01	5.73
	0.02	5.73
	0.02	5.73
	0.04	5.74

As stated above the optimum ultimate pH of meat is 5.5-5.7. Above pH 5.9, pH can start to impact on a variety of meat quality traits including tenderness, retail shelf life (colour stability) and propensity to microbial storage. Although meat companies do not currently routinely measure pH, there is an increased push for meat quality to be of a high standard to satisfy the demands of the high end United Kingdom and European markets to secure the place of lamb as a high quality niche trait that can command a premium.

It has previously been thought that pH was predominately influenced by pre-slaughter treatment of the lambs and processing of the carcass. However, work within our group has demonstrated that genetic variation in pH does exist. Within this Romney data set there was a large variation in the % of lambs that would have been designated high pH ranging from 0 to 17.1%. As was the case for the yield targets, the % designated high pH is related not only to the average of the progeny for the sire, but the amount of variation or range for progeny of the sire. In the case of Armidale 208.05, although the average of his progeny was moderate there was little variation in them which meant that none were above pH 5.9.

So although this is an area that you will not actively select on yet, it is useful to get a feel for the variation that exists within the Romney for this trait.

Table 16: % of Progeny Per Sire with pH Values greater than 5.9 (pH values over 5.9 may impact on meat quality)

	High pH
Armidale 208.05	0.0
Tamlet 726.02	3.1
Annan Downs 180.04	3.4
Glenleith 28.05	5.7
	5.9
	8.1
	8.1
	10.0
	11.4
	11.8
	14.3
	15.0
	17.1

Recommendations for the 2008-2009 Progeny Test

LINKAGES, there needs to be linkages between years and sites that are secure enough that if any one fails there is a backup, therefore, ideally two sires should be used between the years and sites. Although this potentially limits the number of new rams that can be tested, the linkages are of equal importance.

Overall Summary

This year the data was generated and analysed in enough time that it can be used when making breeding decisions for the coming mating season. Data collection for the meat traits went very smoothly.

There is no one standout sire for the 2007-2008 progeny test. Most sires ranked well for a least a couple of traits. So it depend on what traits you are targeting to improve