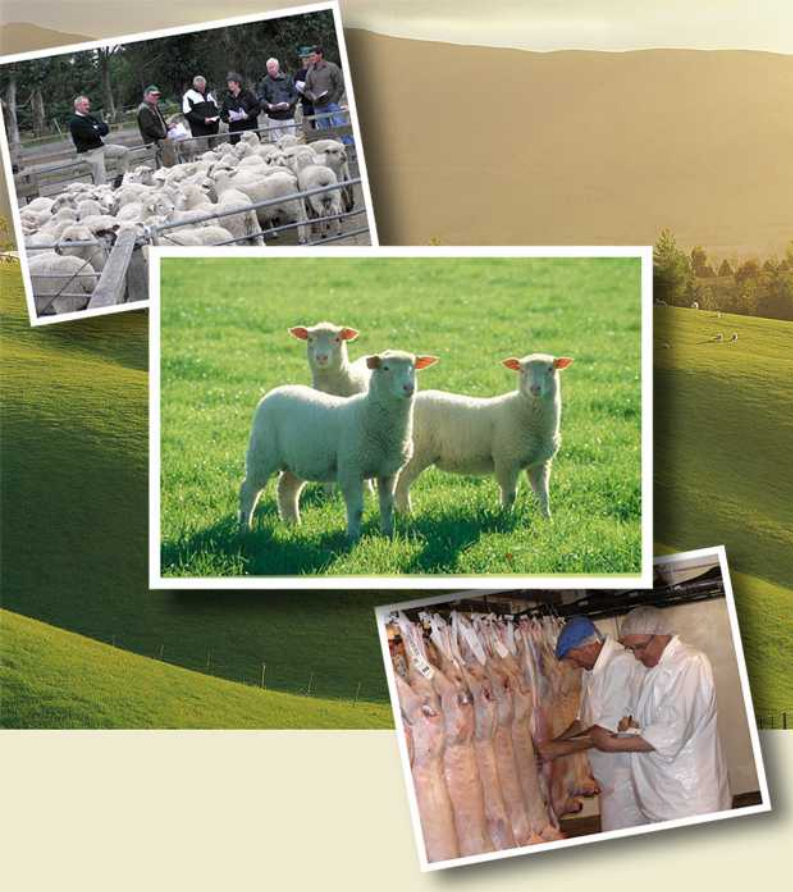

Central Progeny Test Results 2007/2008

MEAT & WOOL NEW ZEALAND

With the support of

Alliance Group

In conjunction with

MEAT & WOOL NZ Genetics

ABACUSBIO LIMITED

agresearch

LINCOLN UNIVERSITY Te Whare Wānaka O Aoraki

On-Farm Research

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KEY:

Sites: A = Ashley Dene
W = Woodlands
P = Poukawa

Years: 98 = 1998/1999 season
99 = 1999/2000 season
00 = 2000/2001 season
01 = 2001/2002 season
02 = 2002/2003 season
03 = 2003/2004 season
04 = 2004/2005 season
05 = 2005/2006 season
06 = 2006/2007 season
07 = 2007/2008 season

BV	Breeding value	GGT21	Facial Eczema
EMA	Eye Muscle Area	NLB	Number of lambs born
FEC	Faecal Egg Count	FW12	Fleece weight at 12 months of age

The results presented in this booklet comprise the top terminal and top dual purpose rams for each index or trait. The CPT Growth Index is based on weaning weight and carcass weight breeding values. The CPT Meat Value Index is based on the breeding values for weight of meat in the leg, loin and shoulder lean as measured by VIAscan.

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INTRODUCTION

Background
A progeny test is used to 'prove' the genetics of a ram by comparing how his progeny perform under the same conditions relative to progeny from other rams. Rams can be compared across different flocks through use of reference sires that create genetic links between flocks. However, there are good reasons to run a progeny test at a central location, usually termed a "central progeny test" (CPT). Reasons include facilitating comparisons of rams that would not normally be made in industry, and the use of novel or expensive measurement methods.

Objectives
The CPT was set up to:

- examine how much industry rams varied in carcass merit, using a sophisticated approach to carcass assessment (i.e. VIAscan)
- demonstrate to industry the extent to which rams varied in the value they could add to farm returns
- improve our understanding of the genetic control of carcass merit and its relationship with other production traits
- foster links between ram breeding groups

The CPT was not set up as a breed comparison, but rather as a **ram** comparison. It has focused on identifying the best genetics regardless of breed. Breed comparisons require testing many randomly selected rams per breed, and with few progeny per ram. The CPT has used a small number of rams, with more progeny per ram, from as many breeds as possible to improve genetic linkage within the New Zealand sheep industry.

Genetic links between breeding groups established through the CPT have been used in large scale evaluations performed across flocks and across breeds by SIL. These are the "ACE" (Advanced Central Evaluation; www.silace.co.nz) evaluations. CPT data has provided the links necessary for this to be undertaken.

History of the CPT
In 2002, the "Alliance CPT" was established at Woodlands, in Southland, with significant funding from the Alliance Group and the collaboration of AgResearch, SIL and Abacus Biotech. Terminal sire and dual purpose rams were sourced from industry and mated to Coopworth or Coopworth-cross ewes. Lambs were assessed for growth rate and carcass merit, making use of Alliance's VIAscan technology for carcass assessment. This was repeated in 2003, with the addition of a second site at Ashley Dene in collaboration with Lincoln University. Lambs continued to be assessed for growth rate and carcass merit.

In 2004 there was a change to also include maternal traits for dual purpose rams. Dual purpose rams were mated to sufficient ewes to generate female progeny to be retained for assessment of maternal traits. Surplus females and all male lambs were assessed for growth rate and carcass merit. Funding for the work with female progeny was provided by Meat & Wool New Zealand. In 2005 a third site was established at Poukawa (Hawkes Bay) with On-Farm Research and another round of matings was carried out, as specified for 2004.

For 2006, 2007 and 2008, matings have being carried out, as specified for 2004, and historic weaning and carcass weight data from the Poukawa Elite Lamb programme (1998 to 2004) has been added to the analysis. Funding is now provided by Meat & Wool New Zealand and it is known as the M&WNZ CPT. The results in the following tables are based on analysis of data from all rams evaluated to date. Results are presented as two indexes (CPT Growth and CPT Meat Value index) and individual breeding values are presented for traits of interest.

Changes to the presentation of results for the 2007/2008 born progeny
A ram 'aging' policy has being introduced, whereby rams will no longer be listed in the results booklet if they are older than ten years of age **and** have no progeny born in SIL-recorded flocks in the last four years. This means that the rams listed are currently, or were recently, available.

The CPT management committee has decided to use SIL across-flock breeding values using data from the three CPT flocks where they are available and where the traits are measured in the same way as in the sheep industry. Breeding values are available from a variety of sources including the CPT, SIL and the SIL Advanced Central Evaluation (ACE), which can be confusing. Within this booklet, SIL across-flock breeding values are used for the traits: weaning weight; WormFEC; and fleece weight. SIL ACE breeding values (i.e. including data outside the CPT) are used where the breeding value needs greater numbers of records to improve the accuracy of breeding values, namely numbers of lambs born and facial eczema breeding values. All other breeding values are estimated using CPT data and stand-alone analyses. These include breeding values for the traits: hindleg lean; loin lean; shoulder lean; carcass weight; and eye muscle area.

The breeding values for the meat traits dressing percentage, pH, meat colour and fat colour are not included this year, except in the table of the top 20 dual purpose and terminal sire rams overall. They have been removed because they are not routinely measured in the sheep industry and there is currently no way to reward farmers for selecting for these traits. However, they will continue to be measured so that the genetic relationships between these quality traits and growth and yield traits can be monitored.

The CPT was able to access some semen held in storage from a group of five leading Romney rams from the early 1980s. The results are interesting in that they give an indication of the improvement in performance that has accumulated over the last three decades. These rams are included in every dual purpose breeding value table and are identified as “1980s Sires”.

HOW TO UNDERSTAND THE CPT RESULTS

This booklet contains breeding values and indexes for rams used in the M&WNZ CPT. In addition, rams used in the Elite Lamb programme at Poukawa from 1998 to 2004 have been included for the evaluation of growth. A total of 143 rams have been evaluated to date, and the breeding values for the **top 25 terminal sire and top 25 dual purpose rams** are presented for each trait or index.

A breeding value is an estimate of the animal’s true genetic worth, or the value of a parent’s genes, half of which are passed on to its offspring. A breeding value does not necessarily reflect the observed performance of the animal itself because the observed performance is a combination of both the animal’s genes and effects of the environment it has been raised in.

The CPT breeding values and indexes presented here are given as deviations from an average of zero, which means that half of the rams tested will have negative breeding values. Breeding values that were sourced from SIL or SIL ACE (i.e. weaning weight, WormFEC, numbers of lambs born and facial eczema) are adjusted so the average of animals born in 1995 was zero. Only results of the top ranked rams are presented.

To give an example of how to use a breeding value, if a ram has a breeding value of +1.0kg for weaning weight, we would expect the progeny to be 0.5 kg heavier at weaning (the sire provides half of the genes) than the progeny of the average ram in the CPT. Likewise, if a ram has a breeding value of -1.0kg for weaning weight, we would expect his progeny to be 0.5kg lighter than the CPT average. A negative breeding value for weaning weight does not necessarily mean that the ram is poor for growth rate, e.g. many dual purpose rams do not have the high growth rates found in the terminal sire breeds because they have been selected for many other traits. Thus, some of the better dual purpose rams for growth have negative breeding values because higher values are more likely to be for terminal sire rams. The average for each trait presented in the booklet is given at the bottom of the page for reference.

A breeding index is simply a way of adding together the breeding values for a number of traits, but with an economic weighting applied to each breeding value so that the best economic response is achieved. For example, the CPT Growth Index is a combination of the weaning weight and carcass weight breeding values.

Some CPT breeding values differ from those produced by the Sheep Improvement Ltd (SIL) genetic evaluation system in several ways. Firstly, the CPT collects additional measurements which are not routinely collected in the wider industry. For example, the CPT Meat Value Index is based on the weight of meat in each of the hindleg, loin and shoulder cuts as measured by the VIAscan grading system. Secondly, the breeding values for meat traits are calculated at a fixed carcass weight, whereas in SIL, breeding values are calculated at a fixed age.

For further information on breeding values, indexes and selection, visit the SIL website (www.sil.co.nz). Follow the link to "Technical Information" to find the SIL Users Manual and a number of technical documents.

Historical weaning and carcass weight data are included from the Poukawa Elite Lamb programme making it possible to include these rams in the CPT Growth Index. This is the only table that they occur in, and they are marked with a hash (#) to indicate their source.

The CPT results are also available to download on the M&WNZ website (www.meatandwoolnz.com; follow the links "Farming and Research" and "CPT results"), as a booklet, or as an Excel spreadsheet.

CPT GROWTH INDEX ($)

Terminal: **Range: -$1.78 to $3.33**

TAG	Flock	Breed	Sites	Progeny	Growth Index	Rank
447/03	**Blythburn**	**Texel**	**P06**	**42**	**$3.33**	**1**
430/03	Glengarry	Poll Dorset	A05 P05 W05	123	$3.14	2
25/99	**Tyanee**	**Suffolk**	**Link sire**	**717**	**$2.94**	**3**
17/02	Tyanee	Suffolk	P06	98	$2.92	4
4012/99	**Bilberry Oaks**	**Hampshire**	**W02 W03**	**51**	**$2.78**	**5**
767/99	Darrenal	Dorset Down	A03 E03	14	$2.60	6
231/97	**Bankhead**	**Southdown**	**A05**	**51**	**$2.58**	**7**
211/98	Kurralea	Poll Dorset	E00 W02	66	$2.36	8
***128/97**	**Punchbowl**	**Suffolk**	**E02 W03**	**113**	**$2.36**	**9**
33/04	Myola	South Suffolk	P06	56	$2.35	10
299/01	**Ohio**	**Poll Dorset**	**E03 A04 E04**	**70**	**$2.32**	**11**
107/02[#]	Anui	Dorset Down	E04	51	$2.09	12
191/04	**Winiata**	**Dorset Down**	**P05**	**93**	**$2.05**	**13**
11/03	Goldstream	Suffolk	P05	24	$1.99	14
120/00	**Glendhu**	**Dorset Down**	**W03**	**34**	**$1.97**	**15**
49/05	MegaMeat	Poll Dorset	P07	80	$1.93	16
35/01	**Glengarry**	**Poll Dorset**	**A03 E03 W03**	**39**	**$1.91**	**17**
514/00	Linton	Poll Dorset	W04	46	$1.90	18
275/04	**Goldstream**	**Suffolk**	**A07**	**68**	**$1.88**	**19**
61/04	Twin Farm	Suffolk	W06	30	$1.87	20
31/02	**Kaya Dorper**	**Dorper**	**A05 P07**	**99**	**$1.75**	**21**
D244/05	Hawea Poll Dors	Poll Dorset/Tex	P07	101	$1.71	22
25/02	**Glenaven**	**Hampshire**	**W04**	**40**	**$1.70**	**23**
1010/03	Punchbowl	Suffolk	W07	41	$1.67	24
130/05	**Bellview**	**Dorset Down**	**A07**	**76**	**$1.58**	**25**
911/99	Murray Downs	Texel	W03	31	$1.53	26
44/02	**WTD**	**Texel**	**P05**	**49**	**$1.53**	**27**
77/95	Douglas Downs	Dorset Horn	W02 W04	75	$1.52	28
80/03	**Silverhope**	**Poll Dorset**	**P06**	**47**	**$1.43**	**29**
JM148/03	Clifton	Suffolk	P07	47	$1.42	30

** This index is a terminal sire growth index based on weaning and carcass weight breeding values.*

[#] These rams were evaluated in the M&WNZ Elite Lamb programme at Poukawa (1998-2004) and only appear in the CPT Growth Index since detailed carcass information was not available on their progeny

CPT GROWTH INDEX ($)

Dual Purpose: **Range: -$3.71 to $2.53**

TAG	Flock	Breed	Sites	Progeny	Growth Index	Rank
D110/04	**Blackdale Stud**	**Textra**	**W07**	**105**	**$2.53**	**1**
2165/97	Wairere	Romney	W02 W03 A04	87	$0.91	2
742/04	**Cairnlea**	**Coopworth**	**W07**	**103**	**$0.46**	**3**
232/01	TRIGG	Romney	W03	20	$0.41	4
542/04	**Hazeldale**	**Perendale**	**W06**	**29**	**$0.30**	**5**
358/04	MNCC	Coopworth	P07	110	$0.25	6
5093/99	**Meadowslea**	**Romney**	**A03**	**22**	**$0.10**	**7**
D611/04	Glenovis	Corriedale	A07	112	$0.05	8
426/99	**Mt Guardian**	**Perendale**	**W03**	**22**	**$0.01**	**9**
NGAIO/02#	Ngaio Glen	Romney	E04	21	-$0.02	10
HG552/02	**Clifton**	**Corriedale**	**A05**	**57**	**-$0.09**	**11**
55/01	Bonnieview	Perendale	W05	20	-$0.09	12
2247/04	**Rosedale**	**Growbulk**	**W07**	**86**	**-$0.15**	**13**
97/02	Raywell	Borderdale	A03 A04	52	-$0.21	14
2135/99	**Rosedale**	**Growbulk**	**W03**	**30**	**-$0.30**	**15**
833/02	Tamlet	Coopworth	W05 W06	55	-$0.30	16
300/03	**MNCC**	**Coopworth**	**W05**	**27**	**-$0.33**	**17**
493/00	Hazeldale	Perendale	W03	23	-$0.35	18
172/02	**Glen Rannoch**	**Perendale**	**A04**	**34**	**-$0.38**	**19**
627/01	TRIGG	Romney	A06	72	-$0.39	20
132/01	**Kelso**	**Composite**	**W03**	**31**	**-$0.46**	**21**
435/98	Kelso	Composite	W02	31	-$0.51	22
1082/02#	**Ngaputahi**	**Growbulk**	**E04**	**29**	**-$0.56**	**23**
1560/03	The Gree	Greeline	W06	25	-$0.61	24
531/98	**Wharetoa**	**Coopworth**	**W03**	**29**	**-$0.62**	**25**
781/00	Shoreford	Romney	W03	30	-$0.62	26
1235/00	**Strathblane**	**Corriedale**	**A04**	**30**	**-$0.71**	**27**
138/01	Edale	Growbulk	A03	38	-$0.72	28
431/04	**Twin Farm**	**TEFRom**	**W07**	**77**	**-$0.74**	**29**
386/03	Rene	Perendale	A07	100	-$0.75	30
165/81	***1980s sires***	***Romney***	***W07***	***41***	***-$1.65***	***55***

** This index is a terminal sire growth index based on weaning and carcass weight breeding values.*
 # These rams were evaluated in the M&WNZ Elite Lamb programme at Poukawa (1998-2004) and only appear in the CPT Growth Index since detailed carcass information was not available on their progeny

CPT MEAT VALUE INDEX ($)

Terminal: **Range: -$2.17 to $3.54**

TAG	Flock	Breed	Sites	Progeny	Meat Value Index	Rank
299/00	**Waikite**	**Texel**	**W02 W03**	**58**	**$3.54**	**1**
110/03	Murray Downs	Texel	W05	37	$2.68	2
275/04	**Goldstream**	**Suffolk**	**A07**	**68**	**$2.53**	**3**
101/03	Landover	Texel	W07	30	$2.47	4
XA2/99	**The Burn**	**Texel**	**W02**	**22**	**$2.45**	**5**
52/04	Mount Linton	Suftex	W06	32	$2.33	6
114/03	**Kepler Supreme**	**Composite**	**A05**	**32**	**$2.32**	**7**
299/01	Ohio	Poll Dorset	A04	34	$2.22	8
911/99	**Murray Downs**	**Texel**	**W03**	**31**	**$2.10**	**9**
44/02	WTD	Texel	P05	49	$2.01	10
400/00	**Brandes Burton**	**Texel**	**W02 W04**	**62**	**$1.88**	**11**
1296/03	Mount Linton	Texel Cross	W05	40	$1.79	12
021/01	**Broken Hut**	**Texel**	**A03**	**29**	**$1.57**	**13**
77/95	Douglas Downs	Dorset Horn	W02 W04	75	$1.49	14
T369/02	**Wharetoa**	**Composite**	**A03**	**28**	**$1.48**	**15**
T210/04	Wharetoa	Meatmaker	W06	34	$1.42	16
70/01	**Torresdale**	**Suffolk**	**W05**	**40**	**$1.35**	**17**
18/02	Brandes Burton	Texel	A07	69	$1.34	18
25/99	**Tyanee**	**Suffolk**	**Link sire**	**468**	**$1.22**	**19**
*128/97	Punchbowl	Suffolk	W03	37	$1.16	20
JM148/03	**Clifton**	**Suffolk**	**P07**	**47**	**$1.08**	**21**
5258/01	Mount Linton	Texel	W03	30	$0.98	22
2002/02	**Mount Linton**	**Texel Cross**	**A04**	**34**	**$0.96**	**23**
65/03	Pahiwi	Suffolk	A06	53	$0.95	24
154/99	**Ivadene**	**Poll Dorset**	**W02**	**25**	**$0.92**	**25**

Dual Purpose: **Range: -$2.96 to $3.18**

TAG	Flock	Breed	Sites	Progeny	Meat Value Index	Rank
D110/04	**Blackdale Stud**	**Textra**	**W07**	**105**	**$3.18**	**1**
4203/02	Kelso	Composite	P06	39	$1.59	2
386/03	**Rene**	**Perendale**	**A07**	**100**	**$1.12**	**3**
88/02	TRIGG	Romney	W05	25	$1.00	4
542/04	**Hazeldale**	**Perendale**	**W06**	**29**	**$0.88**	**5**
431/04	Twin Farm	TEFRom	W07	77	$0.69	6
132/01	**Kelso**	**Composite**	**W03**	**31**	**$0.47**	**7**
781/00	Shoreford	Romney	W03	30	$0.33	8
358/04	**MNCC**	**Coopworth**	**P07**	**110**	**$0.33**	**9**
435/98	Kelso	Composite	W02	29	$0.30	10
138/01	**Edale**	**Growbulk**	**A03**	**34**	**$0.30**	**11**
11/01	Little River	Cheviot	A03 W03	60	$0.29	12
1560/03	**The Gree**	**Greeline**	**W06**	**24**	**$0.17**	**13**
84/04	ARDG Elite	Romney	P07	107	$0.12	14
774/02	**Flockton**	**Perendale**	**A04**	**37**	**$0.08**	**15**
172/02	Glen Rannoch	Perendale	A04	34	$0.02	16
211/99	**Blackdale Stud**	**Coopworth**	**W03**	**29**	**$0.00**	**17**
34/01	Twin Farm	TEFRom	W03 W06	51	-$0.02	18
627/01	**TRIGG**	**Romney**	**A06**	**72**	**-$0.04**	**19**
JL1695/1	WRIG	Romney	P05	35	-$0.11	20
55/01	**Bonnieview**	**Perendale**	**W05**	**20**	**-$0.15**	**21**
407/03	Hiwinui	Romney	P05	32	-$0.19	22
97/02	**Raywell**	**Borderdale**	**A03 A04**	**48**	**-$0.21**	**23**
2247/04	Rosedale	Growbulk	W07	86	-$0.24	24
34/02	**Wai-Iti Romneys**	**Romney**	**P06**	**24**	**-$0.29**	**25**
165/81	*1980s sires*	*Romney*	*W07*	*41*	*-$0.68*	*33*

** The relative value for meat in the loin was 4x that of meat in the shoulder and 2x that of meat in the hindleg.*

WEANING WEIGHT BV (KG)

Terminal: **Range: -1.00 to 4.55**

TAG	Flock	Breed	Sites	Progeny	WWT BV	Rank
17/02	**Tyanee**	**Suffolk**	**P06**	**94**	**4.55**	**1**
447/03	Blackdale Stud	Texel	P06	36	3.9	2
231/97	**Bankhead**	**Southdown**	**A05**	**44**	**3.7**	**3**
25/99	Tyanee	Suffolk	Link sire	468	3.57	4
430/03	**Glengarry**	**Poll Dorset**	**A05 P05 W05**	**115**	**3.56**	**5**
*128/97	Punchbowl	Suffolk	W03	37	3.31	6
767/99	**Darenal**	**Dorset Down**	**A03**	**14**	**3.31**	**7**
4012/99	Bilberry Oaks	Hampshire	W02 W03	50	3.27	8
33/04	**Myola**	**South Suffolk**	**P06**	**49**	**3.24**	**9**
211/98	Kurralea	Poll Dorset	W02	28	2.96	10
275/04	**Goldstream**	**Suffolk**	**A07**	**68**	**2.54**	**11**
77/95	Douglas Downs	Dorset Horn	W02 W04	75	2.49	12
514/00	**Linton**	**Poll Dorset**	**W04**	**46**	**2.41**	**13**
1010/03	Punchbowl	Suffolk	W07	41	2.36	14
130/05	**Belview**	**Dorset Down**	**A07**	**76**	**2.31**	**15**
35/01	Glengarry	Poll Dorset	A03 W03	37	2.2	16
61/04	**Twin Farm**	**Suffolk**	**W06**	**30**	**2.1**	**17**
11/03	Goldstream	Suffolk	P05	23	2.09	18
25/02	**Glenaven**	**Hampshire**	**W04**	**39**	**2.06**	**19**
114/03	Kepler Supreme	Composite	A05	32	2.05	20
169/02	**Ohio**	**Poll Dorset**	**W06**	**35**	**2.05**	**21**
191/04	Winiata	Dorset Down	P05	91	1.95	22
49/05	**MegaMeat**	**Poll Dorset**	**P07**	**80**	**1.93**	**23**
80/03	Silverhope	Poll Dorset	P06	42	1.9	24
9/03	**Pahiwi**	**Suffolk**	**P05**	**103**	**1.86**	**25**

Dual Purpose: **Range: -4.90 to 2.97**

TAG	Flock	Breed	Sites	Progeny	WWT BV	Rank
D110/04	**Blackdale Stud**	**Textra**	**W07**	**105**	**2.97**	**1**
742/04	Cairnlea	Coopworth	W07	103	1.83	2
232/01	**TRIGG**	**Romney**	**W03**	**20**	**1.41**	**3**
D611/04	Glenovis	Corriedale	A07	112	1.28	4
2165/97	**Wairere**	**Romney**	**W02 W03 A04**	**86**	**1.17**	**5**
HG552/02	Clifton	Corriedale	A05	46	0.86	6
531/98	**Wharetoa**	**Coopworth**	**W03**	**27**	**0.74**	**7**
833/02	Tamlet	Coopworth	W05 W06	54	0.51	8
358/04	**MNCC**	**Coopworth**	**P07**	**110**	**0.48**	**9**
97/02	Raywell	Borderdale	A03 A04	48	0.47	10
781/00	**Shoreford**	**Romney**	**W03**	**30**	**0.46**	**11**
2247/04	Rosedale	Growbulk	W07	86	0.43	12
542/04	**Hazeldale**	**Perendale**	**W06**	**29**	**0.42**	**13**
5093/99	Meadowslea	Romney	A03	22	0.38	14
55/01	**Bonnieview**	**Perendale**	**W05**	**20**	**0.04**	**15**
512/05	Kamahi	Perendale	W07	35	-0.12	16
435/98	**Kelso**	**Composite**	**W02**	**29**	**-0.14**	**17**
4014/96	Waihora	Romney	W04	21	-0.19	18
627/01	**TRIGG**	**Romney**	**A06**	**72**	**-0.2**	**19**
1832/02	Awareka	Romney	W04 A04	73	-0.24	20
426/99	**Mt Guardian**	**Perendale**	**W03**	**19**	**-0.42**	**21**
2135/99	Rosedale	Growbulk	W03	29	-0.53	22
386/03	**Rene**	**Perendale**	**A07**	**100**	**-0.63**	**23**
5828/02	Waihora	Romney	W04	50	-0.65	24
1617/04	**Awareka**	**Romney**	**W07**	**84**	**-0.70**	**25**
165/81	*1980s sires*	*Romney*	*W07*	*41*	*-2.73*	*58*

** The average weaning weight was 29.6kg.*

WORMFEC BV (%)

Terminal: **Range: -39.2% to 97.3%**

TAG	Flock	Breed	Sites	Progeny	WormFEC BV	Rank
E-140/00	**Turnberry**	**Composite**	**W02**	**20**	**-39.2**	**1**
299/00	Waikite	Texel	W02 W03	58	-38.1	2
44/02	**WTD**	**Texel**	**P05**	**49**	**-29.9**	**3**
167/02	MEBA	Texel	W04	50	-25.5	4
61/97	**Oringi**	**Oxford Down**	**A04**	**37**	**-24.0**	**5**
77/95	Douglas Downs	Dorset Horn	W02 W04	75	-23.9	6
9/03	**Pahiwi**	**Suffolk**	**P05**	**103**	**-21.5**	**7**
110/03	Murray Downs	Texel	W05	37	-20.8	8
49/05	**MegaMeat**	**Poll Dorset**	**P07**	**80**	**-16.8**	**9**
19/03	Tasvic Downs	Southdown	P05	60	-16.7	10
929/00	**Craig Annat**	**South Suffolk**	**W02**	**30**	**-15.4**	**11**
165/00	Torresdale	Suffolk	W02	30	-13.7	12
65/03	**Pahiwi**	**Suffolk**	**A06**	**53**	**-13.5**	**13**
18/02	Brandes Burton	Texel	A07	69	-12.0	14
127/05	**Douglas Downs**	**Poll Dorset**	**W07**	**36**	**-11.6**	**15**
62/02	Silverstream	Dorset Down	W05	30	-11.3	16
911/99	**Murray Downs**	**Texel**	**W03**	**31**	**-10.5**	**17**
400/00	Brandes Burton	Texel	W02 W04	62	-10.1	18
78/02	**Lincoln**	**Dorset Down**	**W04**	**30**	**-8.8**	**19**
120/00	Glendhu	Dorset Down	W03	33	-8.6	20
25/99	**Tyanee**	**Suffolk**	**Link sire**	**468**	**-7.1**	**21**
101/03	Landover	Texel	W07	30	-6.5	22
41/00	**Tasvic Downs**	**Southdown**	**W02**	**44**	**-6.4**	**23**
XA2/99	The Burn	Texel	W02	22	-6.1	24
T533/01	**Wharetoa**	**Composite**	**W02 W03**	**51**	**-3.6**	**25**

Dual Purpose: **Range: -54.3% to 85.6%**

TAG	Flock	Breed	Sites	Progeny	WormFEC BV	Rank
386/03	**Rene**	**Perendale**	**A07**	**100**	**-54.3**	**1**
649/01	Glenbrook	Romney	P06	33	-46.5	2
4014/96	**Waihora**	**Romney**	**W04**	**21**	**-45.6**	**3**
722/03	Rose Mains	Perendale	W05	36	-40.2	4
4203/02	**Kelso**	**Composite**	**P06**	**39**	**-38.7**	**5**
165/81	*1980s sires*	*Romney*	*W07*	*41*	*-38.1*	*6*
1035/02	**Newhaven**	**Perendale**	**W04**	**31**	**-37.9**	**7**
JL1695/1	WRIG	Romney	P05	35	-34.4	8
664/98	**ARDG Elite**	**Romney**	**W03**	**16**	**-31.7**	**9**
850/00	Hillcrest	Perendale	W03	28	-30.4	10
706/00	**Lincoln**	**Coopworth**	**Link sire**	**486**	**-29.7**	**11**
1617/04	Awareka	Romney	W07	84	-27.5	12
34/02	**Wai-Iti Romneys**	**Romney**	**P06**	**24**	**-26.9**	**13**
147/01	Tresco	Romney	W05	28	-26.1	14
132/01	**Kelso**	**Composite**	**W03**	**31**	**-25.9**	**15**
300/03	MNCC	Coopworth	W05	27	-25.6	16
5093/99	**Meadowslea**	**Romney**	**A03**	**22**	**-24.4**	**17**
1235/00	Strathblane	Corriedale	A04	30	-20.4	18
D110/04	**Blackdale Stud**	**Textra**	**W07**	**105**	**-19.1**	**19**
407/03	Hiwinui	Romney	P05	32	-15.6	20
2135/99	**Rosedale**	**Growbulk**	**W03**	**29**	**-14.9**	**21**
34/01	Twin Farm	TEFRom	W03 W06	51	-12.8	22
1002/03	**Mt Guardian**	**Perendale**	**W06**	**26**	**-11.1**	**23**
542/04	Hazeldale	Perendale	W06	29	-10.5	24
2165/97	**Wairere**	**Romney**	**W02 W03 A04**	**86**	**-8.9**	**25**

** WormFEC breeding values are expressed as a percentage reduction in eggs shed.*

EYE MUSCLE AREA BV (cm^2)

Terminal: **Range: -1.12. to 3.50**

TAG	Flock	Breed	Sites	Progeny	EMA BV	Rank
299/00	**Waikite**	**Texel**	**W02 W03**	**58**	**3.50**	**1**
299/01	Ohio	Poll Dorset	A04	34	3.04	2
114/03	**Kepler Supreme**	**Composite**	**A05**	**32**	**2.96**	**3**
2002/02	Mount Linton	Texel Cross	A04	34	2.69	4
106/99	**Ohio**	**Poll Dorset**	**W02**	**45**	**2.26**	**5**
127/05	Douglas Downs	Poll Dorset	W07	36	2.10	6
021/01	**Broken Hut**	**Texel**	**A03**	**29**	**1.97**	**7**
T210/04	Wharetoa	Meatmaker	W06	34	1.91	8
33/02	**RBL Rissington**	**Primera**	**W04**	**27**	**1.87**	**9**
430/03	Glengarry	Poll Dorset	A05 P05 W05	115	1.66	10
65/03	**Pahiwi**	**Suffolk**	**A06**	**53**	**1.63**	**11**
77/95	Douglas Downs	Dorset Horn	W02 W04	75	1.61	12
19/03	**Tasvic Downs**	**Southdown**	**P05**	**60**	**1.59**	**13**
458/02	Waikite	Texel	A06	41	1.49	14
18/02	**Brandes Burton**	**Texel**	**A07**	**69**	**1.48**	**15**
80/03	Silverhope	Poll Dorset	P06	42	1.46	16
110/03	**Murray Downs**	**Texel**	**W05**	**37**	**1.45**	**17**
T533/01	Wharetoa	Composite	W02 W03	51	1.44	18
275/04	**Goldstream**	**Suffolk**	**A07**	**68**	**1.34**	**19**
*128/97	Punchbowl	Suffolk	W03	37	1.34	20
D244/05	**Hawea Poll Dors**	**Poll Dorset/Tex**	**P07**	**101**	**1.33**	**21**
78/02	Lincoln	Dorset Down	W04	30	1.30	22
XA2/99	**The Burn**	**Texel**	**W02**	**22**	**1.28**	**23**
400/00	Brandes Burton	Texel	W02 W04	62	1.19	24
447/03	**Blackdale Stud**	**Texel**	**P06**	**36**	**1.15**	**25**

Dual Purpose: **Range: -3.29 to 2.25**

TAG	Flock	Breed	Sites	Progeny	EMA BV	Rank
1560/03	**The Gree**	**Greeline**	**W06**	**24**	**2.25**	**1**
D110/04	Blackdale Stud	Textra	W07	105	1.92	2
138/01	**Edale**	**Growbulk**	**A03**	**34**	**0.96**	**3**
722/03	Rose Mains	Perendale	W05	36	0.73	4
2247/04	**Rosedale**	**Growbulk**	**W07**	**86**	**0.71**	**5**
542/04	Hazeldale	Perendale	W06	29	0.53	6
426/99	**Mt Guardian**	**Perendale**	**W03**	**19**	**0.29**	**7**
300/03	MNCC	Coopworth	W05	27	0.27	8
85/00	**Tahakita**	**Coopworth**	**W04 A04**	**75**	**0.23**	**9**
4203/02	Kelso	Composite	P06	39	0.13	10
11/01	**Little River**	**Cheviot**	**A03 W03**	**60**	**0.13**	**11**
JL1695/1	WRIG	Romney	P05	35	0.04	12
55/01	**Bonnieview**	**Perendale**	**W05**	**20**	**0.02**	**13**
435/98	Kelso	Composite	W02	29	-0.01	14
850/00	**Hillcrest**	**Perendale**	**W03**	**28**	**-0.10**	**15**
781/00	Shoreford	Romney	W03	30	-0.14	16
664/98	**ARDG Elite**	**Romney**	**W03**	**16**	**-0.25**	**17**
165/81	*1980s sires*	*Romney*	*W07*	*41*	*-0.25*	*18*
833/02	**Tamlet**	**Coopworth**	**W05 W06**	**54**	**-0.31**	**19**
1002/03	Mt Guardian	Perendale	W06	26	-0.36	20
742/04	**Cairnlea**	**Coopworth**	**W07**	**103**	**-0.38**	**21**
1617/04	Awareka	Romney	W07	84	-0.42	22
2165/97	**Wairere**	**Romney**	**W02 W03 A04**	**86**	**-0.44**	**23**
278/03	MNCC	Coopworth	W06	30	-0.47	24
84/04	**ARDG Elite**	**Romney**	**P07**	**107**	**-0.52**	**25**

** The average eye muscle area was 11.5cm^2.*

NUMBER OF LAMBS BORN BV

Dual Purpose: **Range: -0.230 to 0.353**

TAG	Flock	Breed	Sites	Progeny	NLB BV	Rank
300/03	**MNCC**	**Coopworth**	**W05**	**27**	**0.353**	**1**
147/01	Tresco	Romney	W05	28	0.336	2
1560/03	**The Gree**	**Greeline**	**W06**	**24**	**0.319**	**3**
313/01	Valley	Coopworth	W04	34	0.251	4
1035/02	**Newhaven**	**Perendale**	**W04**	**31**	**0.229**	**5**
4014/96	Waihora	Romney	W04	21	0.225	6
1617/04	**Awareka**	**Romney**	**W07**	**84**	**0.18**	**7**
627/01	TRIGG	Romney	A06	72	0.179	8
457/00	**Nithdale**	**Romney**	**W06**	**22**	**0.158**	**9**
431/04	Twin Farm	TEFRom	W07	77	0.132	10
706/00	**Lincoln**	**Coopworth**	**Link sire**	**486**	**0.116**	**11**
4203/02	Kelso	Composite	P06	39	0.102	12
649/01	**Glenbrook**	**Romney**	**P06**	**33**	**0.091**	**13**
722/03	Rose Mains	Perendale	W05	36	0.071	14
1235/00	**Strathblane**	**Corriedale**	**A04**	**30**	**0.040**	**15**

** Results are presented for rams with at least 20 daughters with two-tooth lambing records. Only 31 sires qualify to date as daughters were only retained in the CPT from 2004 onwards.*

FLEECE WEIGHT BV

Dual Purpose: **Range: -0.81 to 0.60**

TAG	Flock	Breed	Sites	Progeny	FW12 BV	Rank
1832/02	**Awareka**	**Romney**	**W04 A04**	**73**	**0.60**	**1**
313/01	Valley	Coopworth	W04	34	0.53	2
531/98	**Wharetoa**	**Coopworth**	**W03**	**27**	**0.45**	**3**
278/03	MNCC	Coopworth	W06	30	0.40	4
2165/97	**Wairere**	**Romney**	**W02 W03 A04**	**86**	**0.33**	**5**
781/00	Shoreford	Romney	W03	30	0.29	6
5828/02	**Waihora**	**Romney**	**W04**	**50**	**0.28**	**7**
706/00	Lincoln	Coopworth	Link sire	486	0.26	8
742/04	**Cairnlea**	**Coopworth**	**W07**	**103**	**0.21**	**9**
211/99	Blackdale Stud	Coopworth	W03	29	0.18	10
D110/04	**Blackdale Stud**	**Textra**	**W07**	**105**	**0.13**	**11**
HG552/02	Clifton	Corriedale	A05	46	0.12	12
833/02	**Tamlet**	**Coopworth**	**W05 W06**	**54**	**0.11**	**13**
422/00	Wattlebank	Corriedale	A04 A05	76	0.10	14
18/04	**White Rock**	**Corriedale**	**A06**	**71**	**0.10**	**15**
232/01	TRIGG	Romney	W03	20	0.09	16
358/04	**MNCC**	**Coopworth**	**P07**	**110**	**0.07**	**17**
1235/00	Strathblane	Corriedale	A04	30	0.07	18
435/98	**Kelso**	**Composite**	**W02**	**29**	**0.07**	**19**
D611/04	Glenovis	Corriedale	A07	112	0.07	20
457/00	**Nithdale**	**Romney**	**W06**	**22**	**0.04**	**21**
1617/04	Awareka	Romney	W07	84	0.02	22
426/99	**Mt Guardian**	**Perendale**	**W03**	**19**	**0.01**	**23**
172/02	Glen Rannoch	Perendale	A04	34	0.01	24
5093/99	**Meadowslea**	**Romney**	**A03**	**22**	**0.00**	**25**

** Breeding values for fleece weight at 12 months of age. The average fleece weight was 3.31kg.*

FACIAL ECZEMA BV

Dual Purpose: **Range: -0.52 to 0.69**

TAG	Flock	Breed	Sites	Progeny	GGT21 BV	Rank
649/01	**Glenbrook**	**Romney**	**P06**	**5**	**-0.52**	**1**
706/00	Lincoln	Coopworth	Link sire	40	-0.39	2
542/04	**Hazeldale**	**Perendale**	**W06**	**5**	**-0.33**	**3**
278/03	MNCC	Coopworth	W06	5	-0.31	4
55/01	**Bonnieview**	**Perendale**	**W05**	**5**	**-0.27**	**5**
84/04	ARDG Elite	Romney	P07	5	-0.22	6
722/03	**Rose Mains**	**Perendale**	**W05**	**5**	**-0.16**	**7**
D110/04	Blackdale Stud	Textra	W07	5	-0.16	8
1002/03	**Mt Guardian**	**Perendale**	**W06**	**5**	**-0.12**	**9**
18/04	White Rock	Corriedale	A06	5	-0.11	10
4203/02	**Kelso**	**Composite**	**P06**	**5**	**-0.11**	**11**
HG552/02	Clifton	Corriedale	A05	5	-0.09	12
1617/04	**Awareka**	**Romney**	**W07**	**5**	**-0.07**	**13**
422/00	Wattlebank	Corriedale	A04 A05	5	-0.02	14
34/01	**Twin Farm**	**TEFRom**	**W03 W06**	**5**	**-0.01**	**15**
88/02	TRIGG	Romney	W05	5	-0.01	16

** Breeding values are expressed as the amount of the liver enzyme GGT (Gamma glutamyl transferase) present 21 days after challenging progeny with sporidesmin. GGT is an indication of the amount of liver damage, so low (more negative) breeding values indicate resistance to facial eczema.*

** Facial eczema measurements have only been collected from dual purpose sires for two years, so 32 rams have been evaluated to date.*

TOP 20 TERMINAL RAMS FOR MEAT AND GROWTH

ID	Flock	Breed	Progeny	Meat & growth index ($)	Meat Value Index* ($)	Growth Index ($)	WWT BV (kg)	Worm FEC BV (%)	EMA BV (cm^2)	Dress % BV (%)	Fat Colour BV (b*)	Meat colour BV (a*)	pH BV
299/01	**Ohio**	**Poll Dorset**	**34**	**4.54**	**2.22**	**2.32**	**1.53**	**74.6**	**3.04**	**0.25**	**-1.46**	**-0.25**	**0**
275/04	Goldstream	Suffolk	68	4.41	2.53	1.88	2.54	97.3	1.34	-1.20	1.07	-0.1	0.01
299/00	**Waikite**	**Texel**	**58**	**4.38**	**3.54**	**0.84**	**-0.51**	**-38.1**	**3.5**	**2.12**	**-0.79**	**-0.38**	**0.01**
447/03	Blackdale	Texel	36	4.24	0.91	3.33	3.9	-0.7	1.15	0.36	-4.07	-0.23	0
25/99	**Tyanee**	**Suffolk**	**468**	**4.16**	**1.22**	**2.94**	**3.57**	**-7.1**	**0.31**	**-1.01**	**2.06**	**-0.86**	**0.02**
101/03	Landover	Texel	30	3.85	2.47	1.38	0.3	-6.5	0.92	0.95	-0.12	-0.73	0
430/03	**Glengarry**	**Poll Dorset**	**115**	**3.79**	**0.65**	**3.14**	**3.56**	**33.8**	**1.66**	**0.50**	**-1.75**	**-0.71**	**-0.02**
911/99	Murray Downs	Texel	31	3.63	2.1	1.53	0.78	-10.5	1.04	1.35	-0.41	-0.63	0.02
44/02	**WTD**	**Texel**	**49**	**3.54**	**2.01**	**1.53**	**1.47**	**-29.9**	**-0.36**	**0.37**	**-1.23**	**-0.75**	**0.03**
*128/97	Punchbowl	Suffolk	37	3.52	1.16	2.36	3.31	7.0	1.34	-0.47	-1.45	-1.42	0.07
114/03	**Kepler Supreme**	**Composite**	**32**	**3.39**	**2.32**	**1.07**	**2.05**	**15.0**	**2.96**	**-0.41**	**2.83**	**-0.65**	**0.02**
110/03	Murray Downs	Texel	37	3.24	2.68	0.56	-0.3	-20.8	1.45	1.78	-0.72	-0.96	0.02
400/00	**Brandes Burton**	**Texel**	**62**	**3.24**	**1.88**	**1.36**	**0.96**	**-10.1**	**1.19**	**1.55**	**-0.56**	**0.07**	**0.03**
77/95	Douglas Downs	Dorset Horn	75	3.01	1.49	1.52	2.49	-23.9	1.61	-0.25	0.2	-0.98	-0.03
1296/03	**Mount Linton**	**Texel Cross**	**40**	**2.95**	**1.79**	**1.16**	**1.22**	**35.0**	**0.25**	**0.05**	**-1.56**	**-0.92**	**0.03**
231/97	Bankhead	Southdown	44	2.88	0.3	2.58	3.7	14.2	-0.17	0.08	-0.3	0.44	0.02
11/03	**Goldstream**	**Suffolk**	**23**	**2.86**	**0.87**	**1.99**	**2.09**	**20.9**	**0.28**	**-0.05**	**-2.24**	**0.51**	**0.01**
T369/02	Wharetoa	Composite	28	2.66	1.48	1.18	0.93	-0.8	0.68	0.69	-1.88	1.08	-0.04
4012/99	**Bilberry Oaks**	**Hampshire**	**50**	**2.66**	**-0.12**	**2.78**	**3.27**	**64.6**	**-0.47**	**-0.47**	**-1.39**	**-1.91**	**0**
XA2/99	The Burn	Texel	22	2.51	2.45	0.06	-0.7	-6.1	1.28	1.52	-1.26	-0.45	0

** The combined Growth and Meat Value indexes, calculated by adding together the two individual indexes.*

TOP 20 DUAL PURPOSE RAMS FOR MEAT AND GROWTH

ID	Flock	Breed	Progeny	Meat & growth Index* ($)	Meat Value Index ($)	Growth Index ($)	WWT BV (kg)	Worm FEC BV (%)	EMA BV (cm^2)	Dress % BV (%)	Fat Colour BV (b*)	Meat colour BV (a*)	pH BV	NLB BV	FW12 BV (kg)	FE BV
D110/04	**Blackdale Stud**	**Textra**	**105**	**5.71**	**3.18**	**2.53**	**2.97**	**-19.1**	**1.92**	**0.78**	**-1.27**	**-0.44**	**0.03**		**0.13**	**-0.16**
542/04	Hazeldale	Perendale	29	1.18	0.88	0.30	0.42	-10.5	0.53	-0.43	1.12	0.42	-0.03		-0.48	-0.33
358/04	**MNCC**	**Coopworth**	**110**	**0.58**	**0.33**	**0.25**	**0.48**	**29.0**	**-1.19**	**-0.60**	**0.68**	**1.51**	**-0.05**		**0.07**	**0.19**
386/03	Rene	Perendale	100	0.37	1.12	-0.75	-0.63	-54.3	-2.16	-0.82	0.82	0.02	0.03		-0.09	0.01
4203/02	**Kelso**	**Composite**	**39**	**0.30**	**1.59**	**-1.29**	**-1.70**	**-38.7**	**0.13**	**0.18**	**0.50**	**0.13**	**0.02**	**0.102**	**-0.38**	**-0.11**
132/01	Kelso	Composite	31	0.01	0.47	-0.46	-1.38	-25.9	-0.61	1.60	-0.05	-0.60	0.00		-0.12	
431/04	**Twin Farm**	**TEFRom**	**77**	**-0.05**	**0.69**	**-0.74**	**-1.23**	**-7.9**	**-1.30**	**0.35**	**0.42**	**0.25**	**0.01**	**0.132**	**-0.09**	**0.14**
435/98	Kelso	Composite	29	-0.21	0.30	-0.51	-0.14	-7.5	-0.01	-0.13	-0.24	-0.30	0.02		0.07	
55/01	**Bonnieview**	**Perendale**	**20**	**-0.24**	**-0.15**	**-0.09**	**0.04**	**28.6**	**0.02**	**-0.66**	**-1.23**	**-0.49**	**0.02**	**-0.027**	**-0.03**	**-0.27**
781/00	Shoreford	Romney	30	-0.29	0.33	-0.62	0.46	15.3	-0.14	-1.60	0.09	1.02	-0.01		0.29	
172/02	**Glen Rannoch**	**Perendale**	**34**	**-0.36**	**0.02**	**-0.38**	**-1.06**	**6.7**	**-1.03**	**0.51**	**-0.70**	**0.13**	**0.02**	**-0.063**	**0.01**	
2247/04	Rosedale	Growbulk	86	-0.39	-0.24	-0.15	0.43	-4.6	0.71	-0.66	0.57	0.23	-0.04		0	0.01
232/01	**TRIGG**	**Romney**	**20**	**-0.39**	**-0.80**	**0.41**	**1.41**	**9.5**	**-1.62**	**-0.79**	**-0.25**	**0.33**	**-0.02**		**0.09**	
97/02	Raywell	Borderdale	48	-0.42	-0.21	-0.21	0.47	4.5	-1.29	-0.72	0.39	0.46	0.01		-0.1	
138/01	**Edale**	**Growbulk**	**34**	**-0.42**	**0.30**	**-0.72**	**-1.05**	**43.7**	**0.96**	**0.47**	**-0.83**	**-1.07**	**-0.02**		**-0.12**	
627/01	TRIGG	Romney	72	-0.43	-0.04	-0.39	-0.20	19.6	-2.52	-0.38	1.78	0.42	0.03	0.179	-0.05	0.22
1560/03	**The Gree**	**Greeline**	**24**	**-0.44**	**0.17**	**-0.61**	**-1.41**	**-7.9**	**2.25**	**1.62**	**-0.84**	**0.84**	**-0.01**	**0.319**	**-0.02**	**0.69**
88/02	TRIGG	Romney	25	-0.60	1.00	-1.60	-1.53	5.2	-1.54	-1.32	-1.16	1.38	-0.07	-0.05	-0.09	-0.01
5093/99	**Meadowslea**	**Romney**	**22**	**-0.92**	**-1.02**	**0.10**	**0.38**	**-24.4**	**-1.82**	**-0.43**	**2.04**	**-0.04**	**0.03**		**0**	
2165/97	Wairere	Romney	86	-1.02	-1.93	0.91	1.17	-8.9	-0.44	-0.01	1.31	0.39	-0.01	-0.02	0.33	

** The combined Growth and Meat Value indexes, calculated by adding together the two individual indexes.*

LINK SIRES ACROSS SITES AND YEARS

Terminal sire

			Years and sites used									
ID	**Flock**	**Breed**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
381/98	**Poukawa**	**Composite**		**P**		**P**						
T533/01	Wharetoa	Composite					W	W				
31/02	**Kaya Dorper**	**Dorper**								**A**		**P**
767/99	Darenal	Dorset Down						A, P				
77/95	**Douglas Downs**	**Dorset Horn**					**W**		**W**			
4012/99	Bilberry Oaks	Hampshire					W	W				
263/95	**Aorere**	**Poll Dorset**	**P**	**P**	**P**	**P**	**P**	**P**				
35/01	Glengarry	Poll Dorset						A, P, W				
430/03	**Glengarry**	**Poll Dorset**								**A, P, W**		
211/98	Kurralea	Poll Dorset			P		W					
106/99	**Ohio**	**Poll Dorset**				**P**	**W**					
299/01	Ohio	Poll Dorset						P	A, P			
U33/97	**Mornish**	**Suffolk**					**P, W**					
*128/97	Punchbowl	Suffolk					P	W				
***326/94**	**Punchbowl**	**Suffolk**			**P**			**P**				
*419/96	Punchbowl	Suffolk				P	W					
165/00	**Torresdale**	**Suffolk**					**P, W**					
25/99	Tyanee	Suffolk				P	P	P	A, P	P	A, P, W	A, P, W
400/00	**Brandes Burton**	**Texel**					**W**		**W**			
299/00	Waikite	Texel					W	W				

Dual Purpose

			Years and sites used									
ID	**Flock**	**Breed**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
97/02	**Raywell**	**Borderdale**						**A**	**A**			
11/01	Little River	Cheviot						A, W				
706/00	**Lincoln**	**Coopworth**						**A, W**	**A**	**A, W**	**A, P, W**	**A, P, W**
85/00	Tahakita	Coopworth							A, W			
833/02	**Tamlet**	**Coopworth**								**W**	**W**	
422/00	Wattlebank	Corriedale							A	A		
B40/94	**Silverstream**	**East Friesian**		**P**	**P**							
664/98	ARDG Elite	Romney						W	P			
1832/02	**Awareka**	**Romney**							**A, W**			
2165/97	Wairere	Romney					W	W	A			
34/01	**Twin Farm**	**TEFRom**						**W**			**W**	

MEAT QUALITY AND THE CPT

Meat quality is extremely important to the consumer and the quality of lamb meat is made up of a number of traits. These include; meat and fat colour, pH, tenderness (shear force) and factors affecting the eating experience such as taste, juiciness and smell. The nutritional quality of the meat is increasingly important to consumers as well. This includes the amounts of vitamins, essential minerals (such as iron) and types of fatty acids (such as omega 3).

Meat and fat colour

The first impression for consumers when buying meat is colour and a bright red colour denotes freshness. Factors which influence meat colour include age of the meat, pH, environment and genetics. One of the key challenges for the export of chilled NZ meat products is maintaining shelf life. Premium chilled NZ lamb reaches the supermarket shelves between eight and 12 weeks post slaughter, due to time spent shipping. When the lamb is displayed on supermarket shelves, it is cut and placed in packaging with a gas permeable wrap. The colour of the fresh meat is largely determined by the amount and state of a protein called myoglobin on the cut surface. When the myoglobin is oxidised, it changes the meat from a purple colour to a bright cherry red colour. This process is known as 'blooming'. Over time the myoglobin is further oxidised and the meat changes to an undesirable brown colour. The rate of the deterioration of the meat from red to brown is correlated with the meat's initial colour after bloom (i.e. the brighter the red colour, termed its 'a*' value, the longer it takes to deteriorate).

As part of the CPT, we have collected data for meat and fat colour, using a Minolta Chromometer, since its inception in 2002. Results have shown there is genetic variation in both meat and fat colour. Interestingly, the majority of the top ranking breeding value sires for meat colour, were dual purpose meat breeds, rather than terminal breeds (the top ranked sire for meat colour is currently a WRIG Romney, JL1695/1). There were some correlations between growth and yield and meat colour measurements from the CPT. There is a low to moderate negative correlation between greater growth and yield and meat redness and brightness, i.e. rams that grow faster and yield higher tend to have meat that is less red (lower a* value) and more pale (higher L* value) (see the table below). We are currently investigating these relationships further.

Genetic correlations between meat colour measurements, weaning weight and leg yield

Trait	Weaning weight	Leg yield
L (whiteness)	+0.07	+0.26
a* (redness)	-0.53	-0.29

pH

pH is known to affect both the appearance and eating quality of lamb. The major contributor to high pH meat is stress, but genetic factors (including response to stress) are also important. The relationship between meat quality and pH is non-linear. For example, meat colour problems appear when pH is higher than 5.7. At low and high pH, meat is tender, while at intermediate pH, meat is tough. Loin pH was measured 24 hours post slaughter using three measurements every year of the CPT. The pH levels of animals slaughtered in the CPT have all been very good (i.e. an average of pH 5.7) indicating that the animals have been handled very well. As such, while meat pH has been shown to be a heritable trait, the range of breeding values has been small.

Future directions in meat quality

The CPT is an ideal resource for experiments to do with meat quality, given that the rams in the trial are sourced from many breeds from all over NZ. Results from the CPT show there is genetic variation in the three meat quality traits measured (meat and fat colour and pH). More extensive analyses are being undertaken to understand the relationship between these meat traits and other important production traits. In addition to this, Alliance Group Ltd has collected loins from 2007-born progeny to carry out other meat quality measurements. These include colour stability, tenderness and taste panel assessments of eating quality. Results collected from measurement of these traits will be useful to determine if there are any rams with superior genetics for meat quality for future selection in breeding programmes and will also be used for further examining the relationship between yield and meat quality traits.

ASSESSING THE DOLLAR BENEFITS FROM BUYING BETTER RAMS

Results of the MWNZ CPT are directly relevant to commercial sheep farmers. They can be used to assess the financial impact that rams of specific genetic merit may have on farm profit.

What does selecting a high breeding value (BV) ram actually mean for a commercial farmer?

Farmax, a whole farm modelling program, was used to assess the impact on farm profit of selecting high BV rams that were superior for either weaning weight or carcass value. CPT "carcass value" simply means that there is proportionately more meat in the loin or hindquarter for which a meat company could offer a higher schedule price.

Modelling was carried out for four commercial farms in different areas of New Zealand. The model used ten year historical ranges for seasonal values of prime and store stock. Year-average lamb values used in the exercise were $3.75/ kg carcass weight for the North Island and $3.60/kg for the South Island.

Rams were used as terminal sires since weaning weight and carcass value are more of a focus for these rams than for dual purpose rams where more traits need to be considered (e.g. litter size, disease resistance, wool). For our modelling, it was assumed that average terminal sires were replaced by rams that were one standard deviation (SD) above average for either weaning weight or carcass value.

Typically, 66% of animals lie within one SD of the average. Putting it another way, out of 100 rams, the 17th ranked ram would be about 1 SD above the average compared to an average ram which would be ranked 50th. Using standard deviations means we can compare different traits where the same amount of selection pressure has been applied to each.

A sire passes half of his genetic merit to his progeny. A sire with a BV of +2kg for weaning weight is expected to have progeny averaging 1kg heavier at weaning compared to progeny of an 'average ram'. Corrected to a weaning weight of 25kg, the range in weaning weight BVs for terminal sires evaluated within the CPT has been from -1.00 to +4.55kg. We used SDs for weaning weight of 1.35kg (at 25kg weaning weight) and for carcass value of $1.14 (for an 18kg carcass worth $70).

In our study, sires with a weaning weight BV of +1.35kg, produced heavier lambs at weaning, so more lambs received early season premiums. In addition, more feed was available for the remaining lambs, increasing post-weaning drafting weights by 1 to 2kg. So the effect of high weaning weight BV flowed through to both earlier and heavier lambs. Results are summarised in the table below.

On average, selecting terminal sires for high weaning weight increased carcass weight by 0.55kg and lamb returns by $1.74/lamb across the farms modelled. This translated into an extra return of $234/ram. The greatest benefit to selecting on weaning weight occurred in Hawkes Bay, where a net benefit per ram of $301 reflected the earlier lambing date and early season lamb premiums available.

Sires with a carcass value BV of +$1.14 had no impact on carcass weight and did not attract seasonal procurement premiums. If meat companies were paying on yield, placing the same amount of selection pressure on carcass value for the terminal sires used would give a comparable benefit of around $60 per ram.

We can conclude that size of carcass has a much greater effect on farm returns than does carcass yield (four times more in this study). Therefore, very significant price differentials must operate to move the emphasis from carcass size or growth rate to carcass value. Put simply, a big plain carcass is currently worth more to a commercial farmer than a smaller, stylish one.

Impact on farm gross margin (GM) of selection for weaning weight or carcass value, when buying terminal sire rams. Other statistics presented characterise the farms.

	Hawkes Bay	King Country	Canterbury	Southland
Current farm performance				
Farm size	591	627	583	250
Sheep:cattle ratio	65:35	65:35	60:40	66:34
Total ewes	3690	5000	3450	2300
Ewes to terminal sire	1270	2000	3450	2300
Number of terminal sires	13	21	39	23
Average lambing %	130	135	115	156
Average weaning weight (kg)	30.9	33.8	33.1	33.5
Average lamb carcass weight (kg)	17.1	16.2	16.0	16.9
Average lamb value ($)	60.62	57.00	51.78	57.02
Selecting terminal sires on weaning weight				
Increase in weaning weight (kg)	0.9	0.9	0.9	0.9
Increase in carcass weight (kg)	0.6	0.4	0.4	0.5
Increase in lamb value ($)	2.35	1.62	1.39	1.60
Increase in farm GM ($)	3920	4506	6628	5761
Benefit per ram ($)	301	215	169	250
Selecting terminal sires on carcass value				
Increase in lamb value ($)	0.49	0.46	0.42	0.46
Increase in farm GM ($)	806	1252	1775	1651
Benefit per ram ($)	62	60	45	72

Summary

- The benefits of selecting rams on either weaning weight or carcass value were modelled for four farms in different parts of New Zealand.
- Selecting terminal sires on weaning weight generated an extra $234 per ram. Selecting on weaning weight meant more lambs drafted early, so more feed was available for later lambs and average carcass weight increased.
- Selecting terminal sires on the basis of carcass value produced a comparable benefit of around $60 per ram.
- Size of carcass has a substantially greater effect on farm profit than does carcass value (yield). Very significant price differentials must operate in order to shift the emphasis from carcass size (or growth rate) to carcass merit.

ANIMAL MANAGEMENT PROCEDURES

To date, a total of 143 sires from 15 terminal and 11 dual purpose breeds have been evaluated in the M&WNZ CPT (formerly the Alliance CPT). There are some differences in animal management across the three sites that reflect differences in geographical location and the average performance of the ewe flock at each site. However, wherever possible the animal management procedures are the same across sites. The following is a brief summary of the management procedures applied across sites.

Mating
The aim across the three CPT sites is to have at least 20 progeny per sire for the evaluation of a sire's meat and growth performance for both terminal and dual purpose sires, and 25 ewe progeny retained for maternal evaluations of the dual purpose sires. Numbers of ewes allocated varies between sites due to differences in fertility in the ewe flocks. All ewes are synchronised for mating using CIDRs, whether mated naturally or by AI.

Lambing
The flocks are split into single-bearing and multiple bearing mobs prior to lambing. Lambs are tagged and weighed within 12 hours of birth. Sex, birth rank and rearing rank are recorded at the same time. At some sites, the smallest triplet is mothered onto a single bearing ewe.

Docking
Lambs are vaccinated for diseases and conditions that are relevant to each site. Live weights are collected at docking. Lambing mobs are usually joined together at docking and the grazing mob is recorded

Weaning
Weaning occurs at 12 weeks of age. Live weight is recorded at weaning and a faecal sample collected to measure faecal egg count. Lambs are also dag scored at this time. Lambs which remain after weaning (the first draft for slaughter occurs at weaning) are drenched with an oral anthelmintic.

Drafting for meat and growth performance assessment
All lambs from the terminal sires are drafted for slaughter once they reach the target live weight to achieve a carcass weight of 18kg. All ram lamb progeny, plus surplus ewe lamb progeny from the dual purpose sires, are slaughtered. The first draft occurs at weaning, followed by drafts at monthly intervals thereafter. All remaining slaughter lambs are drafted at the March slaughter. Measurements collected at slaughter include the VIAscan measurements of lean weight in the hindleg, loin and shoulder, dressing percentage, eye muscle area, meat and fat colour and meat pH.

Ewe maternal performance assessment for dual purpose sires
Some ewe lambs from dual purpose sires are retained for evaluation of maternal traits. These ewe lambs are mated first as hoggets and then as two-tooths. Number of lambs born and lamb survival are recorded at each lambing. Date of hogget oestrus and ewe mating weight are also recorded. No further data are recorded on the ewes after the four-tooth lambing results are collected.

Timetable of events for key dates at the three CPT sites for 2007/2008

Event	Poukawa	Ashley Dene	Woodlands
Start of mating	2 March	7 April	13 April
Start of lambing	29 August	1 September	7 September
Docking	At birth	18 September	27 September
Weaning	5 November	5 December	9 December
First draft	13 November	5 December	10 December
Second draft	18 December	16 January	14 January
Third draft	25 January	21 February	12 February
Fourth draft	22 February		11 March

FUTURE OF THE CPT

The seventh cycle of matings (2008) has been completed at Ashley Dene, Poukawa and Woodlands. A total of 12 new terminal sire rams and 14 new dual purpose rams have been mated this year to bring the total rams evaluated to 169.

As with the previous five years, ewe progeny from dual purpose sires will be retained to measure maternal traits and ram progeny will be slaughtered to measure their meat production performance.

The third year-group of ewe progeny (i.e. 2006 born) have now been mated as two-tooths in this years mating (2008). The number of dual purpose rams with lambing results will increase rapidly as larger numbers of ewe progeny reach reproductive age. Likewise, numbers of rams with facial eczema breeding values are increasing rapidly.

Industry Outcomes

- Improved genetic linkages between flocks within a breed, and across breeds. These linkages enhance the ACE analysis (www.silace.co.nz for results) carried out by SIL and ultimately enable better benchmarking of performance across flocks
- Demonstrating genetic variation in animal performance to the New Zealand sheep industry, including why genetic evaluations are the best information to base ram selection decisions on
- The genetics of new commercial traits can be evaluated in the CPT

Sire entry into the CPT

A call is made for expressions of interest to supply rams to the CPT in November each year. All SIL recorded flocks in New Zealand receive notification of the call. The individual ram selection decision is left to the breeder, but spaces in the CPT are allocated on the basis of:

- widespread use of the ram across SIL flocks
- providing stronger connections across groups of flocks to enhance validity of across-flock analyses based on CPT flock data
- the ram should have existing, SIL recorded, across flock information available
- performance information for the individual ram in SIL recorded flocks

Alternatively, rams can be entered into the CPT on a cost-recovery basis.

For further information, or if you want results presented to a farmer meeting, contact Andy Bray andy.bray@meatandwoolnz.com Phone. (04) 474 0693

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