

MARK YOUNG

Beef + Lamb New Zealand Genetics

Mark Young has been with Beef + Lamb New Zealand since 2001 and has primarily worked with SIL, the national system for sheep performance recording and genetic evaluation. SIL now includes flocks supplying nearly 90% of rams used by industry.

Profitable and hardy hill ewes and cows

Beef + Lamb New Zealand Genetics was formed to drive the development of genetic services for sheep and beef cattle improvement. Increases in growth rate and lambing percentages for sheep and growth rate for beef have increased productivity. However, this may have led to increased adult size of ewes and cows, so while productivity per head has risen, productivity per hectare will have risen less. As easier country is converted to dairy, hill country will comprise more of the land used for lamb and beef production and farms have also had to increase stock numbers to remain economically viable. Genetics development needs to be concentrated on future industry needs with profit, not productivity, the primary focus.

The following must receive more attention in future breeding objectives:

- Profit and efficiency per hectare, not per head
- Reducing farm costs
- Improving feed efficiency for maintenance (ewes and cows) and for growth (meat animals)
- Considering the effects of environment on genetic merit
- Making breeding for hill country a major theme, with a strong focus on maternal performance
- Defining genetic merit of ewes and cows that sustain profitability in challenging environments by consideration of longevity and maternal body energy stores
- Improving processing efficiency
- Enhancing product qualities to attract market premiums

MONDAY 12 MAY

 **1.30pm**

| Room 3




Profitable & hardy hill country ewes & cows

Mark Young
B+LNZ Genetics

AgInnovation 12-may-2014

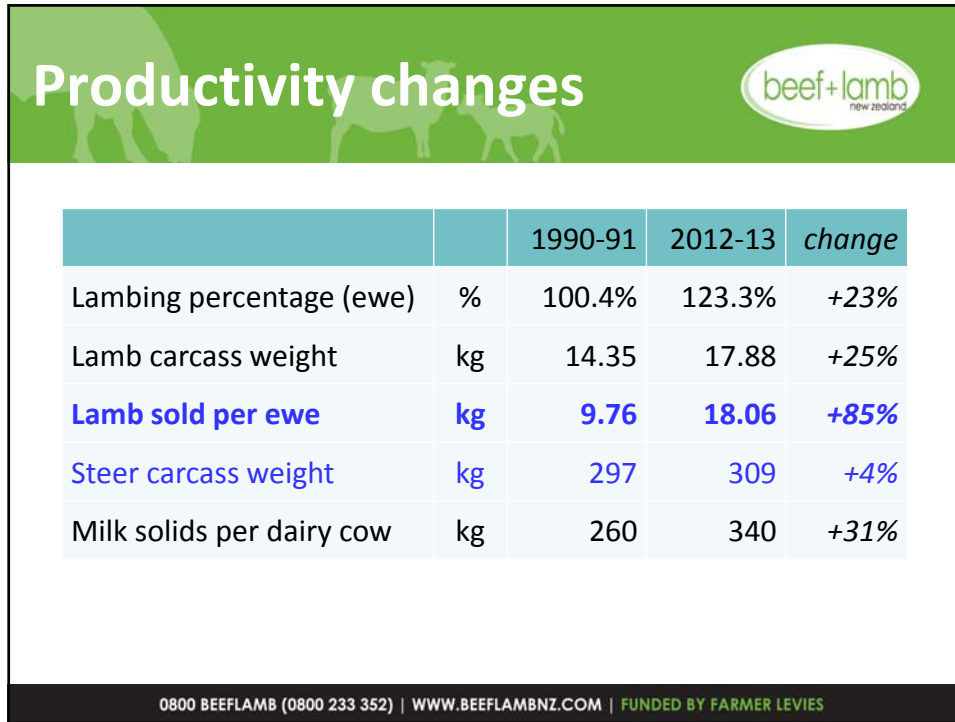
Key Land Use Changes



28 years

	1984-85	2012-13e	
Hill Country Farms (no.)	7,500	6,245	-17%
Finishing Breeding Farms (no.)	12,100	6,125	-49%
Hill Country Farms (eff. m ha.)	6.81	5.93	-13%
Finishing Breeding Farms (eff. m ha.)	3.27	2.34	-28%
Dairy Farms (no.)	14,685	11,800	-20%
Dairy (eff. m ha.)	1.35	2.24	+66%

Commercial farms, excludes lifestyle blocks
Source: Beef + Lamb New Zealand Economic Service
Statistics New Zealand



Profitable ewe attributes	Profitable cow attributes
<ul style="list-style-type: none"> ● 1st lambs at 1 year old ● Produces two lambs each year ● Lambs unassisted ● Is good mother & milks well ● Has a long productive life ● Has low health costs ● Has lower feed costs ● Hardiness ● <i>Fast growing offspring</i> ● <i>Offspring produce quality carcasses</i> 	<ul style="list-style-type: none"> ● 1st calves at 2 years old ● Produces one calf each year ● Calves unassisted ● Is good mother & milks well ● Has a long productive life ● Has low health costs ● Has lower feed costs ● Hardiness ● <i>Fast growing offspring</i> ● <i>Offspring produce quality carcasses</i>

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Profitable ewe attributes

- 1st lambs at 1 year old
- Produces two lambs each year
- Lambs unassisted
- Is good mother & milks well
- Has a long productive life
- Has low health costs
- Has lower feed costs
- **Hardiness**
- *Fast growing offspring*
- *Offspring produce quality carcasses*



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Profitable ewe attributes

What can we select for now?

- 1st lambs at 1 year old
- Produces 2 lambs each year
- Lambs unassisted
- Is good mother & milks well
- Has a long productive life
- Has low health costs
- Has lower feed costs
- **Hardiness**
- *Fast growing offspring*
- *Offspring produce quality carcasses*

- *Yes - but few breeders aiming for this*
- **Yes** - some don't want 3 lambs!
- *Yes - indirect*
- **Yes**
- **No. But coming soon**
- **Some components**
- *Yes - indirect. But some ignore ewe size*
- **No. Needs to be defined**
- **YES!**
- *Yes - needs to be revisited*

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Profitable ewe attributes

Mapping eBVs traits to attributes

- 1st lambs at 1 year old
- Produces two lambs each year
- Lambs unassisted
- Is good mother & milks well
- Has a long productive life
- Has low health costs
- Has lower feed costs
- **Hardiness**
- *Fast growing offspring*
- *Offspring produce quality carcasses*
- Hogget fertility, hogget litter size
- Number of lambs born
- Lamb survival
- Lamb survival maternal, weaning weight maternal
- **Longevity, stayability – coming soon**
- **Parasite resistance or resilience, CARLA, dag score, bareness, FE tolerance**
- Adult ewe size - indirect
- **None. Needs to be defined**
- Weaning weight, autumn weight, carcass weight
- Lean yield, fat yield, EMAC

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What are DP sheep breeders measuring?

Traits in SIL-ACE DP flocks	Measuring trait	% flocks measuring trait
Any trait	242	100%
Reproduction	239	99%
Lamb Survival	242	100%
Lamb Growth	228	94%
Adult Size	144	60%
Wool	169	70%
Meat Yield	176	73%
Internal parasite resistance	35	14%
Facial Eczema Tolerance	45	19%

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Profitable cow attributes

- 1st calves at 2 years old
- Produces one calf each year
- Calves unassisted
- Is good mother & milks well
- Has a long productive life
- Has low health costs
- Has lower feed costs
- **Hardiness**
- *Fast growing offspring*
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- Indirectly
- Indirectly
- Yes
- **No & Yes**
- **Indirectly for some components**
- **No**
- Yes - but expensive to assess
- **No. Needs to be defined**
- **YES!**
- **Yes - a developing area**

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Profitable cow attributes	Mapping eBVs traits to attributes
<ul style="list-style-type: none"> • 1st calves at 2 years old • Produces one calf each year • Calves unassisted • Is good mother & milks well • Has a long productive life • Has low health costs • Has lower feed costs • Hardiness • <i>Fast growing offspring</i> • <i>Offspring produce quality carcasses</i> 	<ul style="list-style-type: none"> • scrotal size - <i>indirect</i> • days to calving, gestation length • Calving ease, birth weight • Nothing for maternal behaviour, 200d milk • Soundness, docility, flight time – <i>all indirect</i> • None • Net feed intake, adult cow size • None. Needs to be defined • 200d milk, 200d LW, 400d LW, 600d LW, carcass weight • EMA, fat depth, beef yield, IMF, shear force
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Overall merit: Sheep SIL economic indexes	
<ul style="list-style-type: none"> • Combine merit across relevant traits • eBV traits <u>weighted</u> according to costs & returns • Ewe breeds – <u>Dual Purpose</u> Overall (DPO) index • Meat breeds – <u>Terminal Sire</u> Overall (TSO) index 	
<p>These are industry wide indexes, not breed specific</p>	
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Overall merit: **Beef** **Economic indexes**



- Combine merit across relevant traits
- eBV traits weighted according to costs & returns
- Breeds have their own indexes
 - * **Self-replacing** – maternal trait emphasis
 - * **Dairy** – *calving ease!*
 - * **Terminal** – growth & carcass merit
 - * **Angus Pure, Hereford Prime** - meat quality emphasis

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Effects of the environment



- Are some genotypes (breeds) better suited to hill country?
 - * To some extent. Usually less than expected
 - * **B+LNZ CPT** (sheep) expanded to include hill country to address this question
- Are breeders selecting their stock under hill farm conditions?
 - * To be sure animals will perform on your farm, buy rams or bulls from a breeder running their stock under conditions similar to yours

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Hardiness



- Hardiness – Robustness – ~~Resilience~~ – Longevity
- Longevity – *Marginal Stayability*
- **Sustained productivity** with low costs under challenging conditions
 - * Temperature
 - * Weather
 - * Feed supply
 - * Health threat
- **Compromise?** – production vs. looking after self

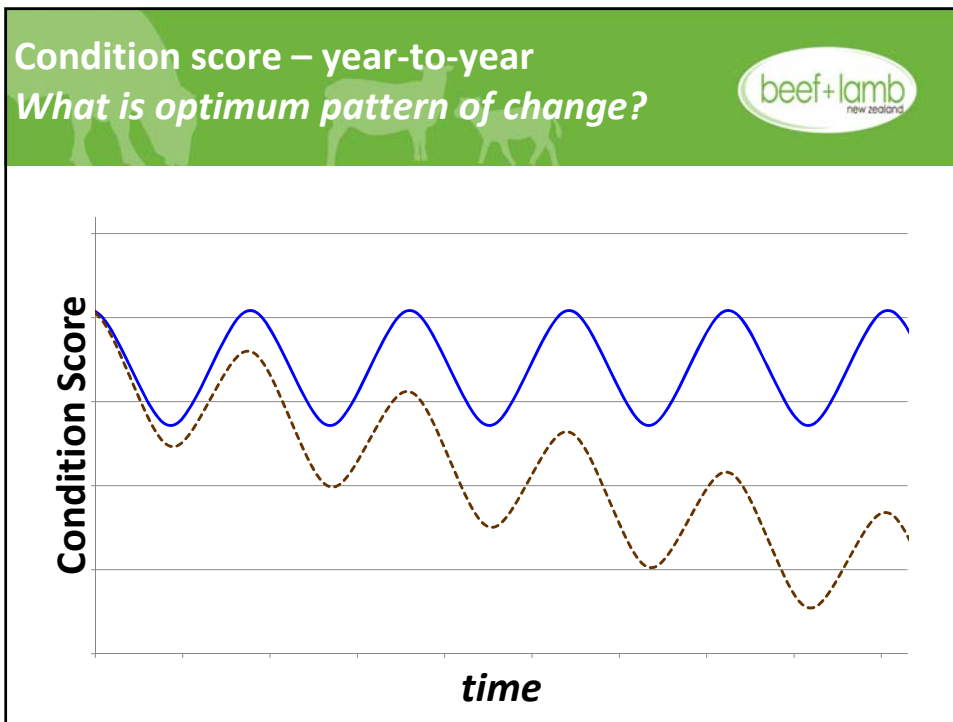
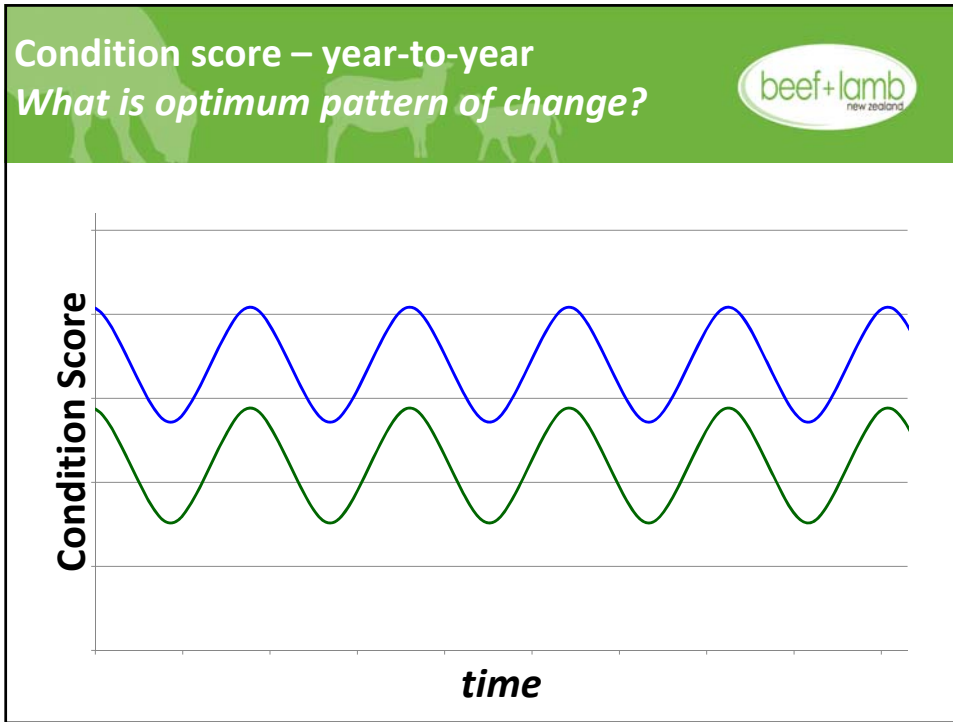
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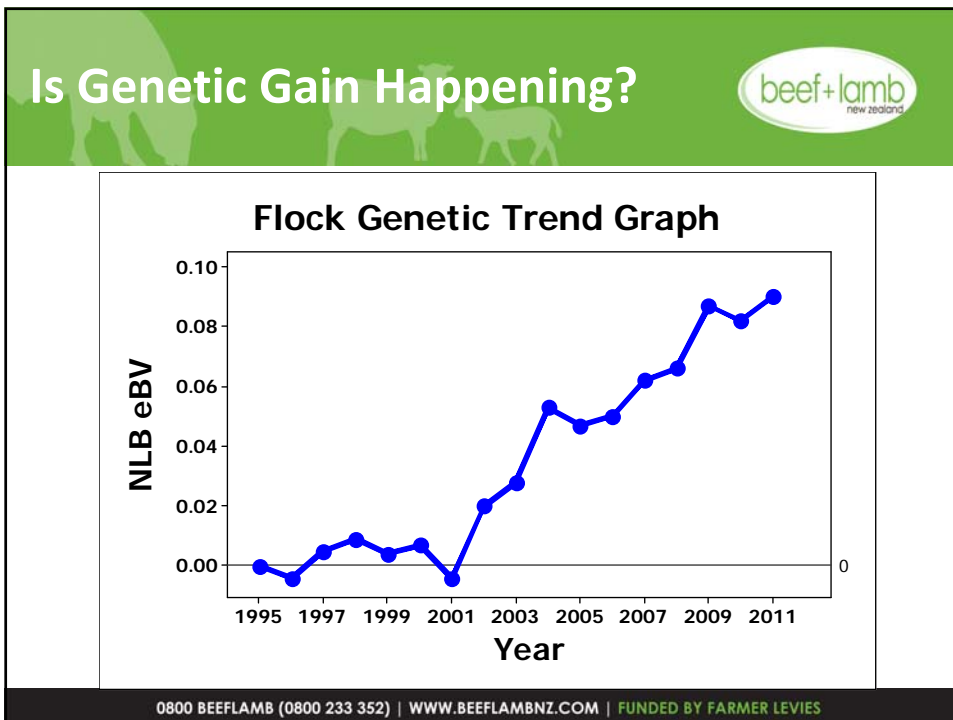
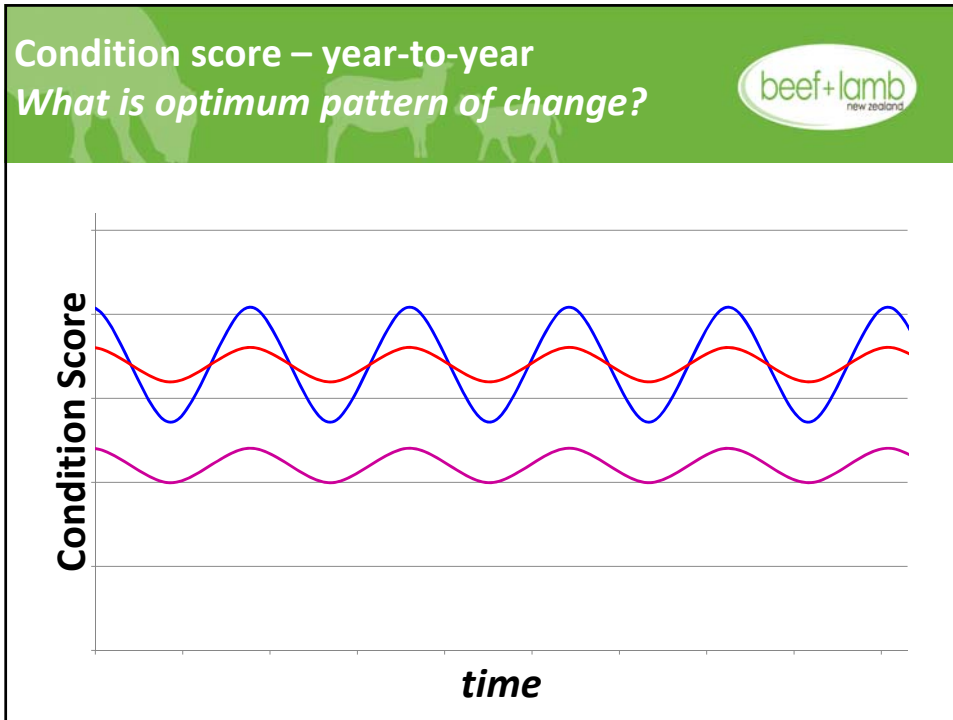
Adult size or Condition Score?

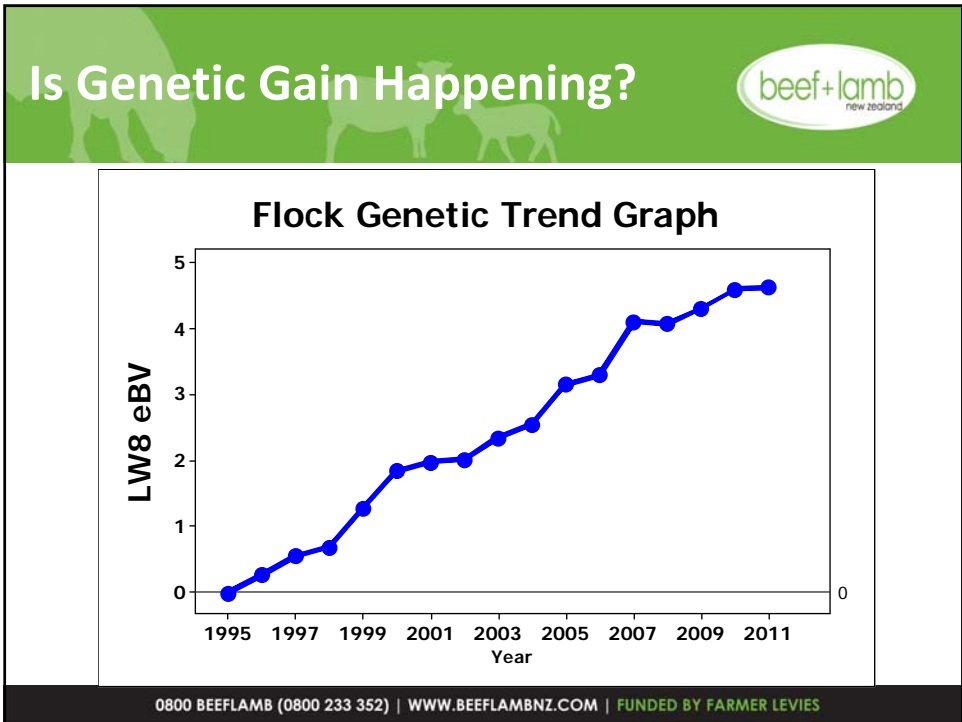
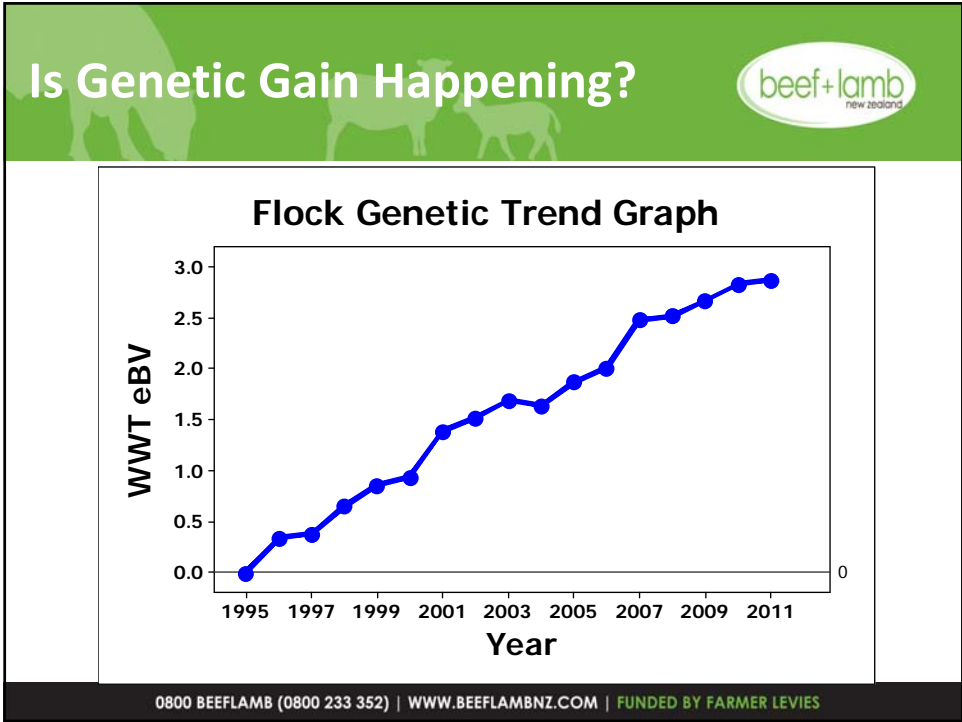


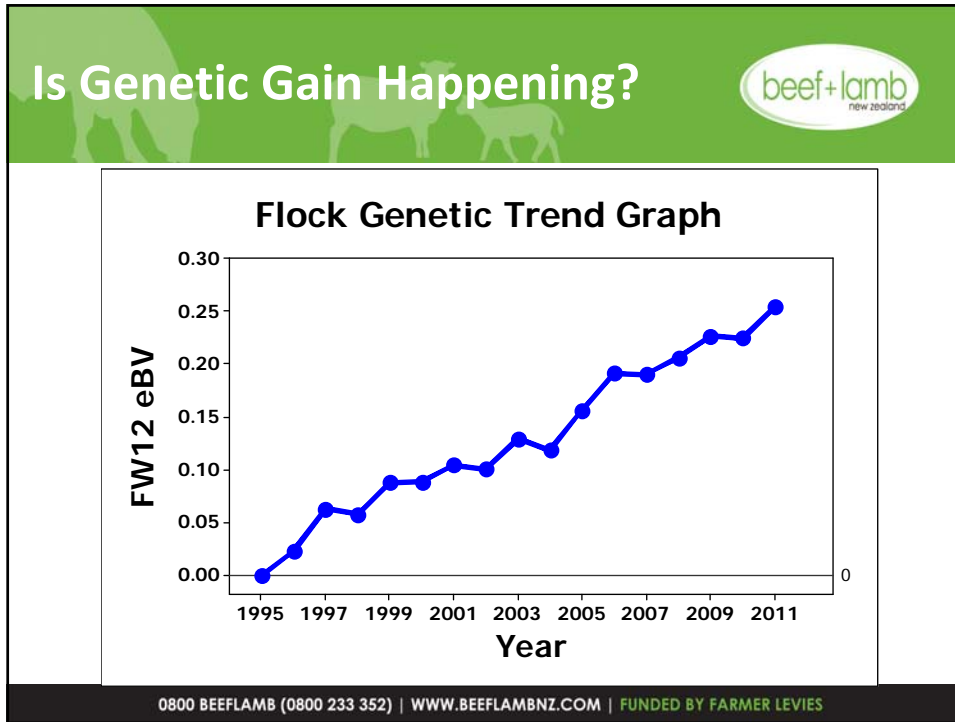
- ***BOTH!***
- Bigger cows and ewes generally eat more
- Condition is important but less well understood
 - * What is relative importance of average condition *versus* change in condition?

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What has sheep genetics delivered?

Trait averages for 2014 <small>where 1995 average = zero</small>	Ewe breeds	Meat breeds
Number of lambs	+11.4 %	n/a
Lamb Survival	+ 0.9 %	+0.9 %
Weaning weight	+3.19 kg	+3.51 kg
Carcass weight	+1.97 kg	+2.07 kg
Ewe weight	+2.64 kg	n/a
Carcass Fat Yield (per 18kg carcass)	-185 g	-480 g
Carcass Lean Yield (per 18kg carcass)	+63 g	+216 g
Fleece weight	+315 g	n/a
Dual Purpose index (RGAW)	+\$13.35	n/a
Terminal Sire index (GM)	n/a	+\$8.37

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Challenges



- Some traits approaching optimums
 - * Diminishing returns from further change
- ***Productivity*** vs. **profit & efficiency**
 - * *Performance per head* vs. **profit per hectare**
- Key profit traits missing
 - * Maternal longevity
 - * Maternal body condition
 - * Hardiness or Robustness – *sustained productivity in variable environment*
 - * Feed efficiency
 - * Product qualities
 - * Other health traits?
- Simplistic definition of carcass merit (esp. sheep) – *really just %lean & %fat*
- Complexity
 - * More traits added to extract more profit = greater complexity

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- **Better breeding objectives**
- **More accurate evaluations**
- **Matching genetics to user needs**

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1. Better breeding objectives



Refocus on farm profit, efficiency, sustainability

- Considering...
 - * productivity, costs, product value, farm system and environment
- Specific focus on
 - * **Maternal performance** – longevity, “robustness”, fat reserves (BCS)
 - * Product qualities – processing, shelf-life, eating experience
- Optimise definition of genetic merit for
 - * **Hill country** *versus* **lowland**
 - * Different products
- Develop systems to “hold” traits near optimums

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2. More accurate evaluations



- DNA information routinely used in evaluations
 - * Accuracy higher, earlier
- Account for biases due to
 - * inbreeding, hybrid vigour and environment
- Explore opportunities to increase genetic gain
 - * e.g. sexed semen
- Next generation evaluation systems
 - * Analysis systems, DNA database

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3. Matching genetics to user needs



- Focus on profit, efficiency and product qualities
- Make genetic information easier to use
 - * Simplify definitions of merit – value, relevance
 - * Define merit for different situations – hill vs. lowland
 - * Readily accessible tools and data
 - * Reduce jargon
- **Bridging the Gap**
 - * Link genetic merit with on farm performance
- Better access, to better information
 - * Farmer, breeder, processor, “consumer”
- Opportunities to build knowledge & skills

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Summary



- We must add key traits missing from the farm profit equation to our breeding goals
- We need to define hardiness/ robustness
- We must place more focus on performance in hill country

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