New Zealand Sheep Evaluation: Reproduction and Meat

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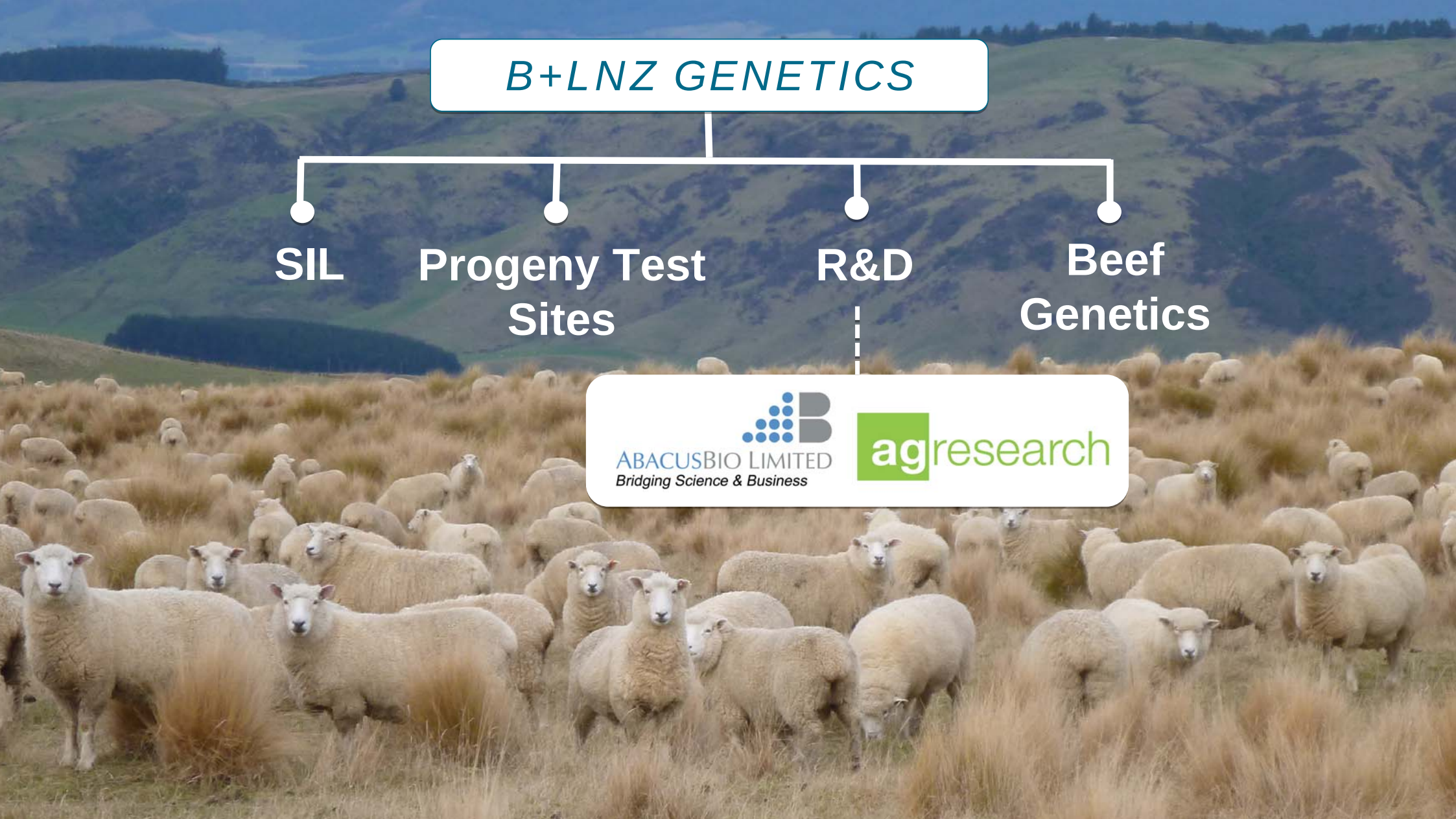
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Progeny Test Sites
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SIL and the weekly NZGE evaluation

- 1100 flocks (includes reference flocks)
- 615 active performance recording flocks
- 365 Maternal flocks
- 190 Terminal flocks
- 60 Maternal and Terminal (mostly Texel)
- 350,000 new animals entered per year (80% are Maternal)

Breeder flock size and number

	No Recorded Flocks	Average Size (no lambs/yr)	Std Dev	Largest
Maternal	360	625	58.4	84 flocks >1000
Terminal	190	225	38.1	7 flocks >1000
Maternal & Terminal	60	270	31.8	2 flocks >1000
Fine Wool	(Australia)			

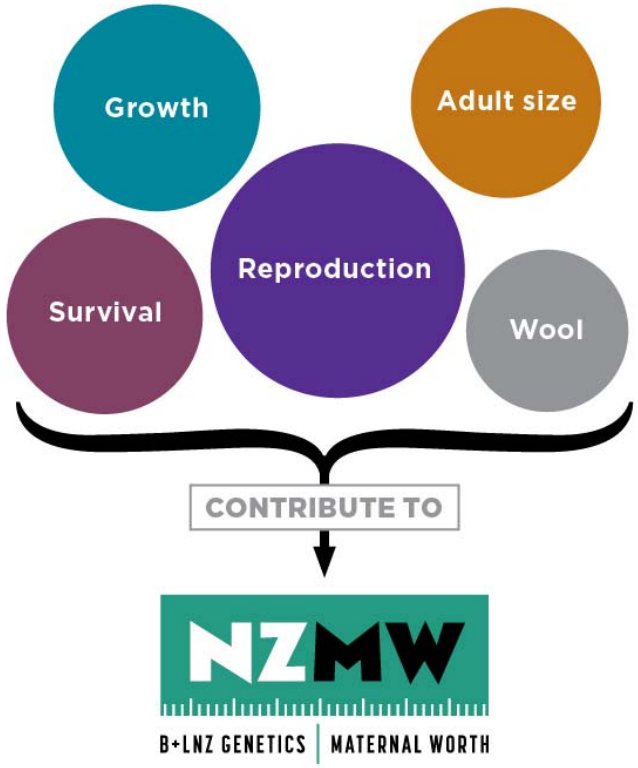
Largest single flock 8800 lambs/year

Goal Trait Groups in NZGE

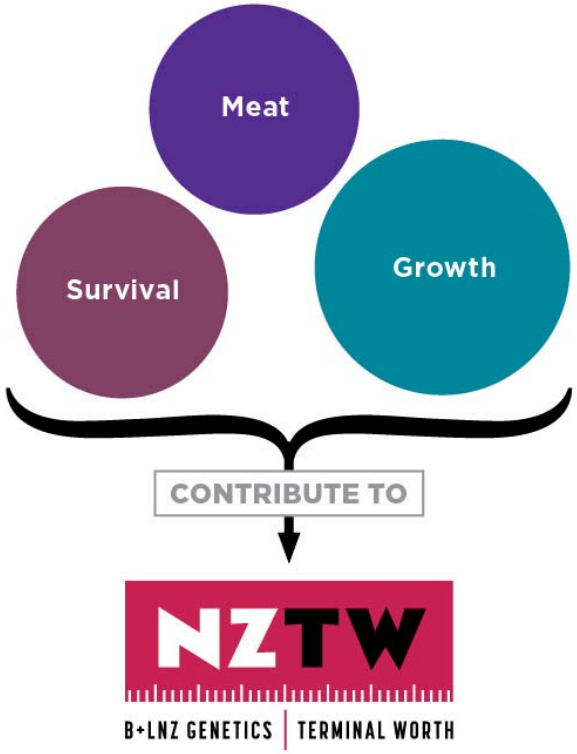
PRODUCTION
Reproduction (*Yearling & Adult*)
Twinning
Survival
Facial Eczema
Lamb Growth
Adult Size
Meat Yield
Wool
Fine Wool
Wool Quality

HEALTH / WELFARE
Facial eczema tolerance
Parasite resistance
Parasite resilience
Carla (parasite immunity)
Bare points
Dag score
Stayability

CORE TRAITS



CORE TRAITS



The NZMW can be tailored for additional traits of interest:

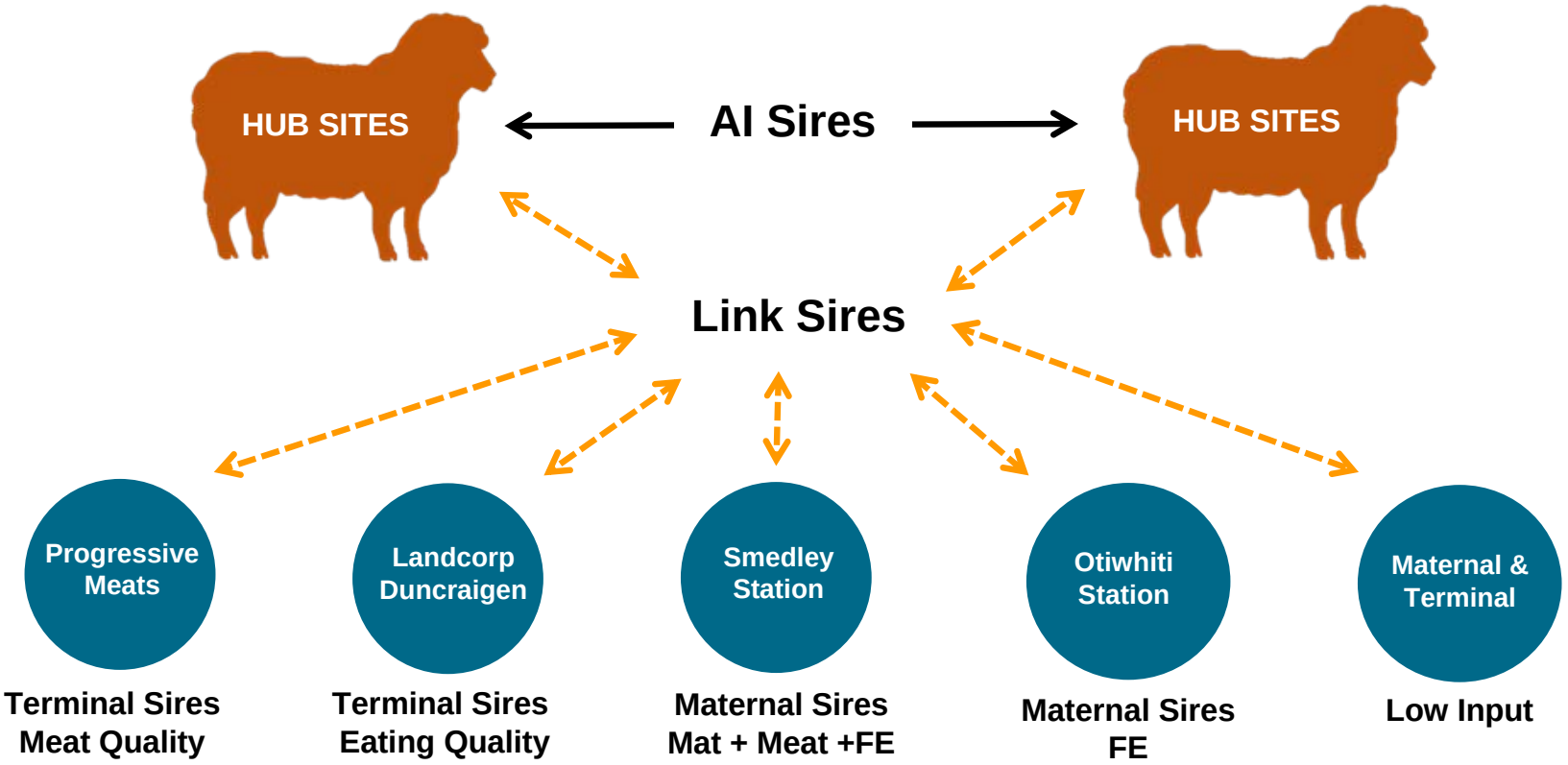
NZMW + Meat

NZMW + Parasite Resistance

NZMW + Body Condition score

NZMW + Facial Eczema

Central Progeny Test



Reproduction

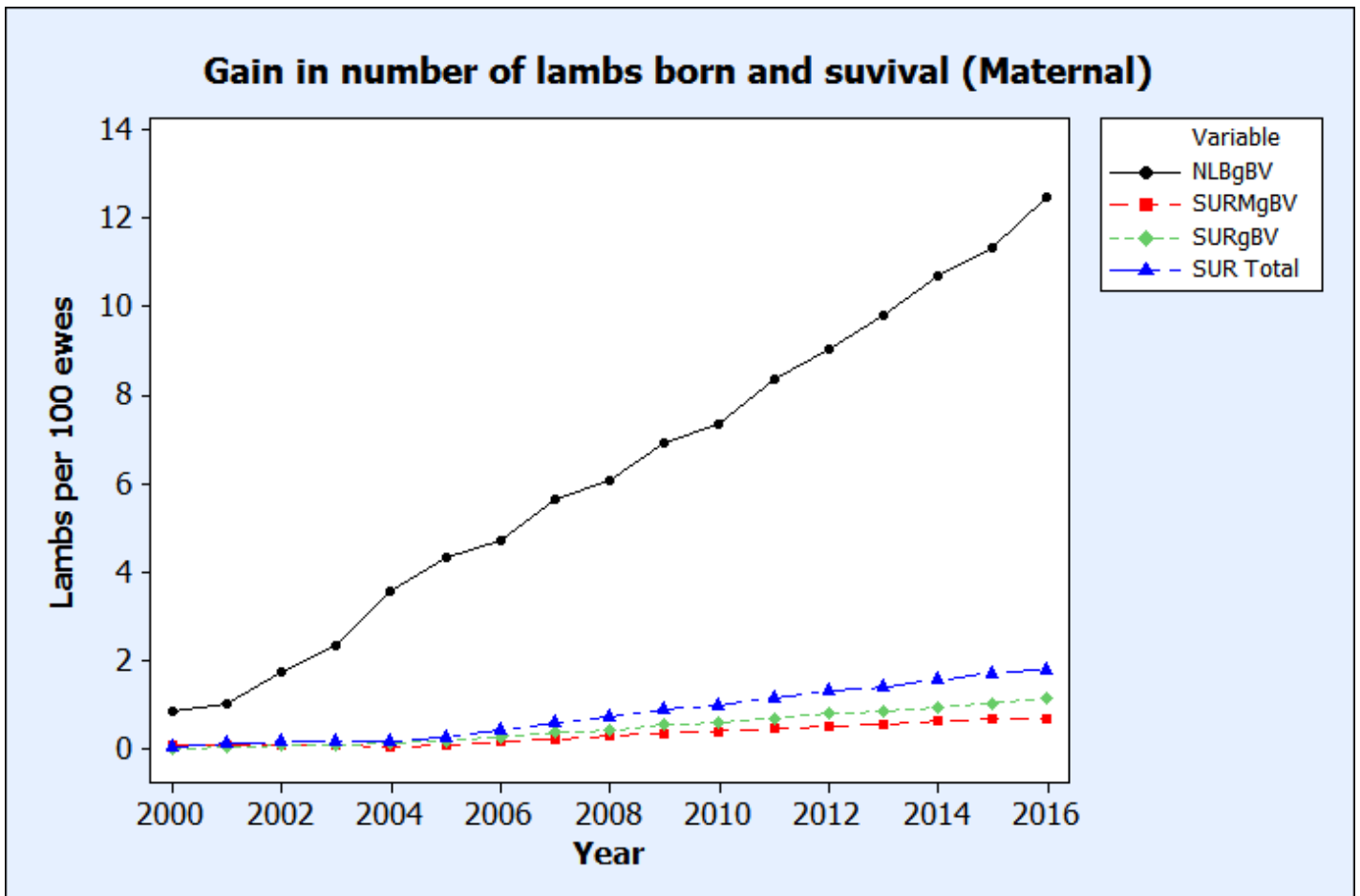
> 95% of animals have full sire and dam pedigree, most tag at birth, about 60 flocks DNA parentage to some extent

BVs for
- Yearling fertility (HFER)
- Yearling number of lambs born (HNLB)

- Adult (2-7yrs) number of lambs born (NLB)

Survival to weaning is a separate trait (direct and maternal)

Gain in Reproduction (Maternal Breeds)



NLB increase is 0.125 over base year (12.5 lambs per 100 ewes)

Survival increase is 0.018 over base year or
1.8 lambs per 100 born

Key factors are full pedigree and for survival automatic data filters

Reproduction Index - maternal

Linear index – constant reward of 2954c for additional lambs

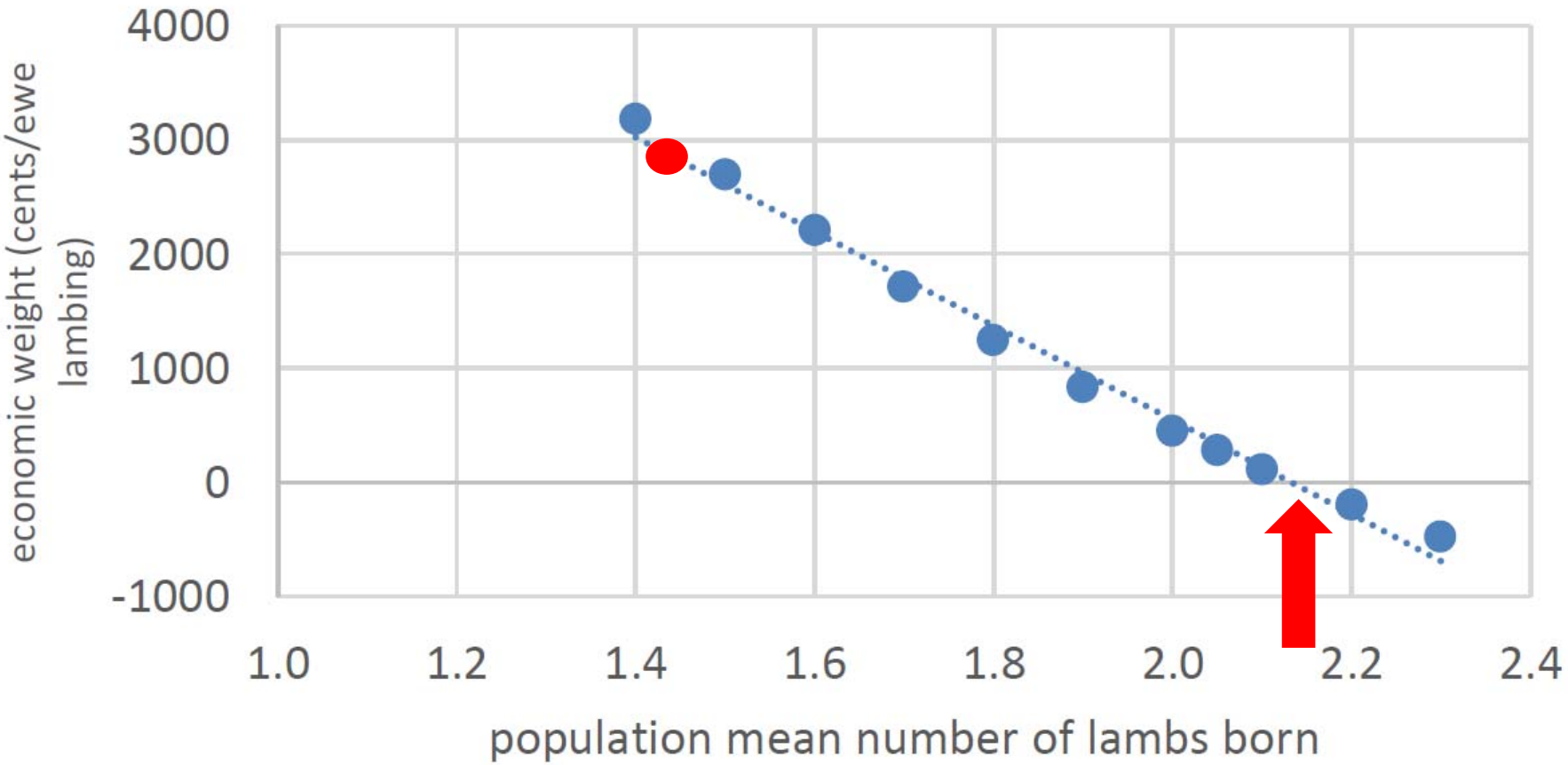
BUT in reality the reward of moving from a twin to a triplet is less than moving from a single to a twin.

The proportion of a flock having twins peaks at about 65%

Extra costs at high lambing %

Feed, health and ewe and lamb deaths

Index – linear reproduction



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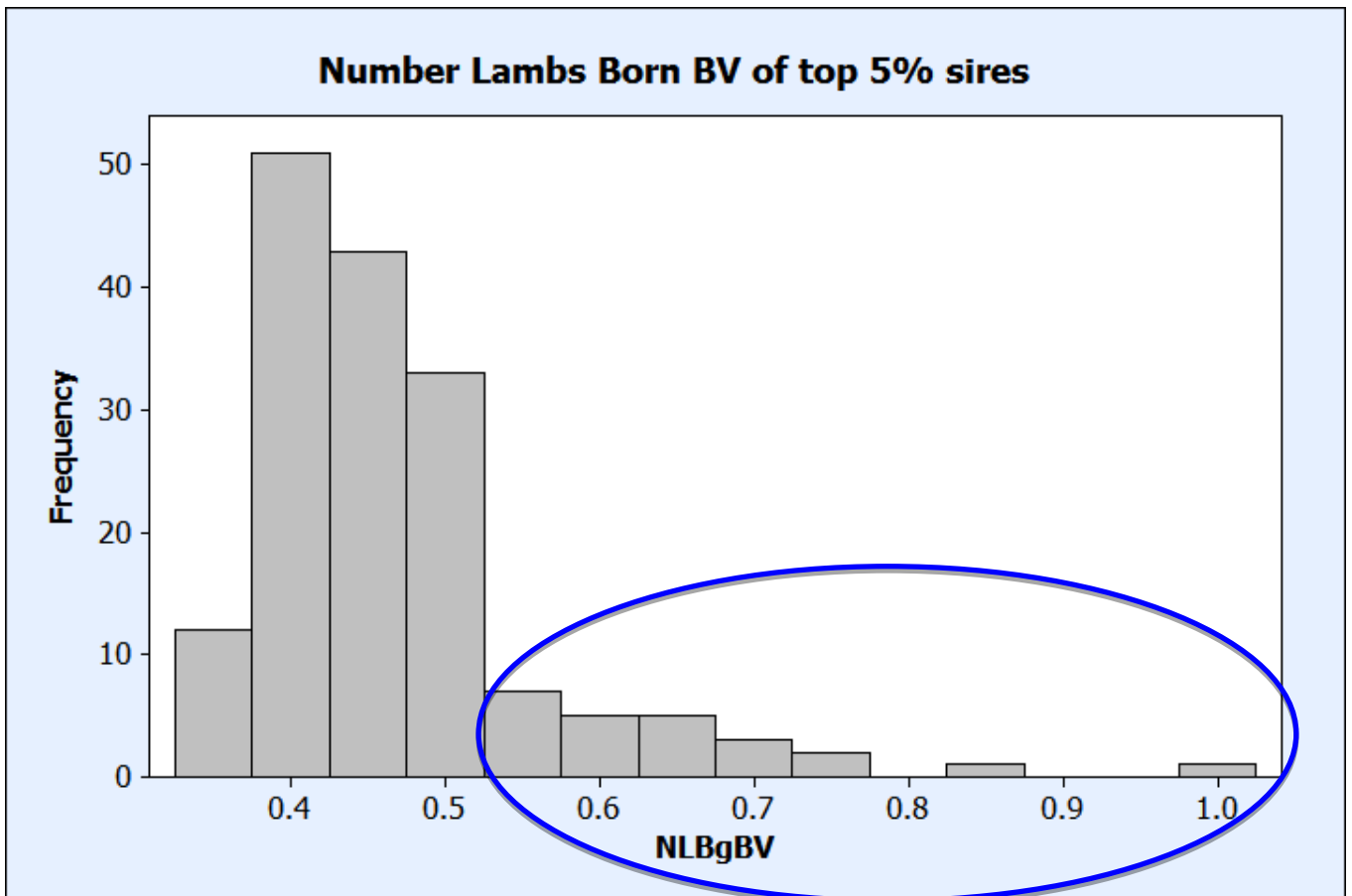
Top 5% maternal sires for reproduction - progeny in last three years



Maternal average
= 0.125 NLBgBV

Daughters have triplets and quads at first 2yr old lambing

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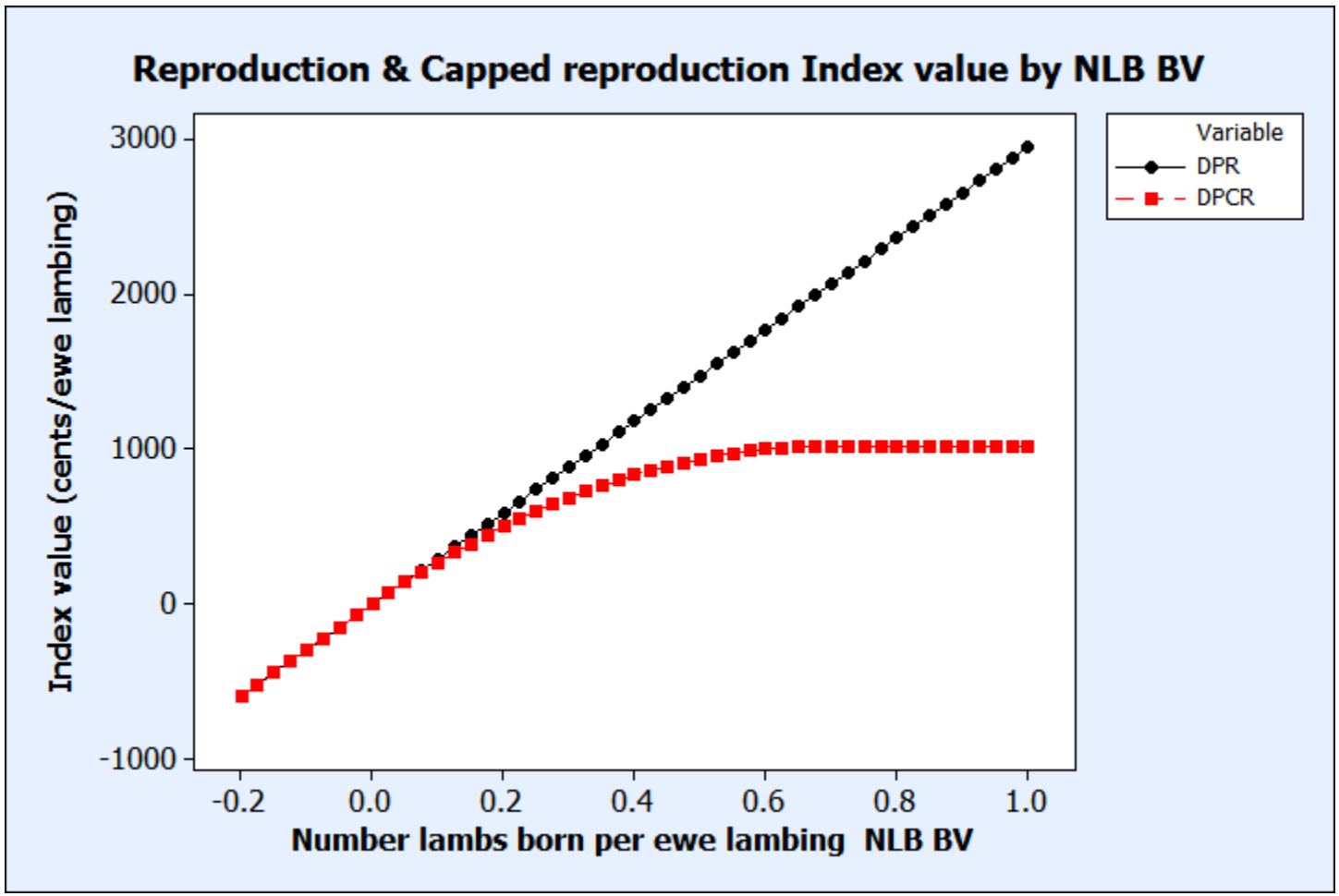
Capped Reproduction (August 2017)

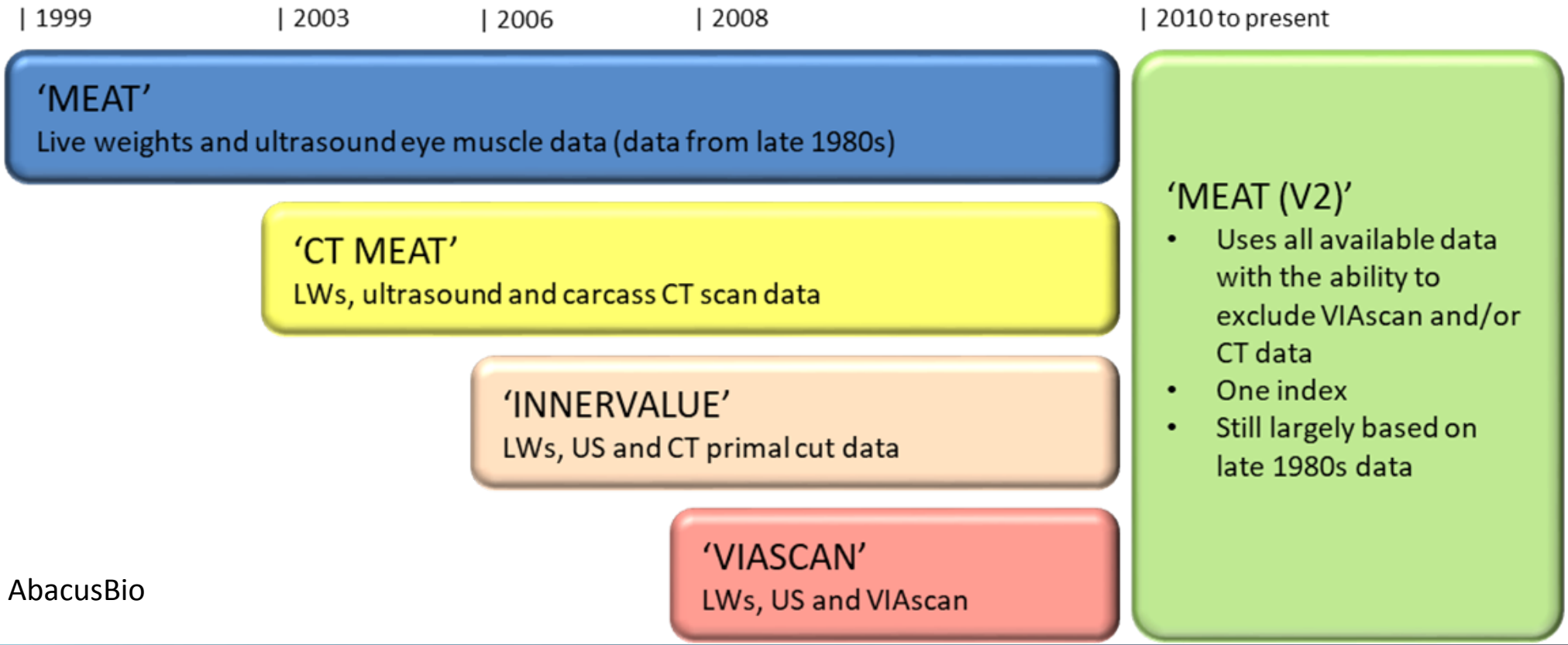
- A non linear approach to reproduction was introduced in 2017, recognizing that there are now animals with NLB BVs in excess of 60% above the base year (1995)
- Decreases the economic weight as NLB BV increases reflecting the diminishing value of more triplet and quad lambs.
- At 0.7 NLB BV the index reward is capped at 1024c for reproduction
- The capped value equates to about 2.13 lambs born per ewe

Capped Reproduction cf to linear approach



Currently fewer than 1% of sires are capped for Reproduction Index

Meat Yield - to date



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Current measurement technologies

Ultrasound

Meat processor, eg VIAscan

CT scanner

- a need to accept other measurements

Meat processor cuts

Dexa X-ray

3 year research program

- 75 to 80 sires that are representative of the industry at current carcass weights, and up to 10 progeny per sire
- Where possible, all progeny measured for all traits (live weight, ultrasound, CT and VIAscan)
- Additional measures of carcass merit (e.g. shape)
- Processor measurements
- Other technology sources
- Calibrate each system to Spiral CT

Meat Quality

- Colour
- pH
- Tenderness
- Marbling / IMF
- Eating quality
- Omega 3, etc

Measurement – hyperspectral imaging, NIR, chemistry

Calibration

Genomics

New Meat modules – R & D in progress

Meat Yield - carcass measurements

- Ability to accept a variety of measurements
- Calibrated against Spiral CT as the gold standard

Meat Quality

- Accept a range of measurements of meat quality
- Actual measurements – pH, colour, tenderness, IMF, eating quality, etc
- Genomic BVs for meat quality

Trait	Rom	Coop	Peren	Texel	CompAll	HighInd
ADAG	0.524	0.537	0.367	0.535	0.644	
AFEC	0.505	0.464	0.44	0.356	0.535	
BCS	0.575	0.659	0.455	0.34	0.595	0.404
CFW12	0.662	0.619	0.615	0.484	0.594	0.63
CW	0.626	0.596	0.476	0.442	0.563	0.489
DRAGE	0.489	0.432			0.361	
EFW	0.435	0.307	0.282	0.296	0.291	
EMA	0.632	0.64	0.494		0.636	
EMAc	0.6	0.565	0.456		0.608	
EWT	0.595	0.544	0.356	0.43	0.582	0.489
FAT	0.485	0.497			0.566	0.38
FATY	0.477	0.591			0.612	0.436
FD	0.574	0.804	0.502	0.587	0.64	
FEC1	0.684	0.779	0.572	0.403	0.603	0.638
FEC2	0.693	0.532	0.517		0.502	
FW12	0.68	0.652	0.638	0.541	0.61	0.599
GGT21	0.656	0.384	0.442		0.517	0.419
HFER	0.495	0.35		0.448	0.513	
HNLB	0.701	0.487	0.341	0.382	0.599	
HQLY	0.552	0.45			0.62	
LDAG	0.493	0.599	0.416	0.539	0.535	
LEAN	0.477	0.542			0.661	
LEANY	0.538	0.455			0.622	
LFW	0.449	0.464	0.41	0.297	0.349	0.492
LNLY	0.534	0.457			0.641	
LW12	0.568	0.57	0.495		0.657	0.525
LW8	0.655	0.683	0.528		0.611	0.555
NLB	0.586	0.548	0.318		0.528	0.419
RGAIN	0.6	0.568	0.487	0.527	0.508	
SHLY	0.597	0.468			0.634	
SUR	0.435	0.455	0.452	0.339	0.453	
SURM	0.453	0.492	0.509	0.358	0.417	
WWT	0.724	0.692	0.642	0.479	0.59	0.539
WWTM	0.487	0.501	0.465	0.444	0.512	

Sheep Genomics

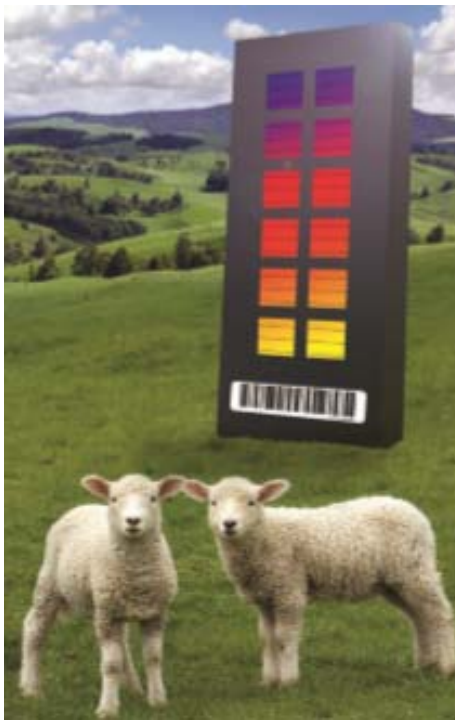
Currently

- Production Traits
- Some health traits

- Meat/Quality Traits 2018
- Methane 2018

  (research BVs)

Some breed constraints



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Genomics and Single Step

- Currently a two step process in NZGE and report gBVs
- Range of genotype information is expanding (Meat Q, Methane)
- Developing a Single Step evaluation – expected later this year


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