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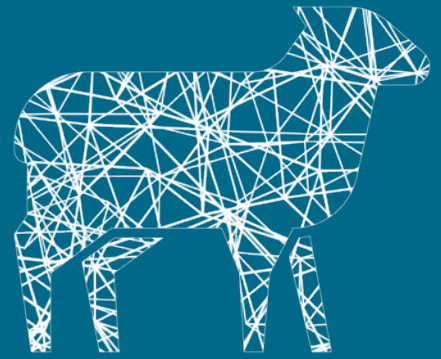
SHEEP BREEDERS' **ROADSHOWS 2022**



2022 Index Updates

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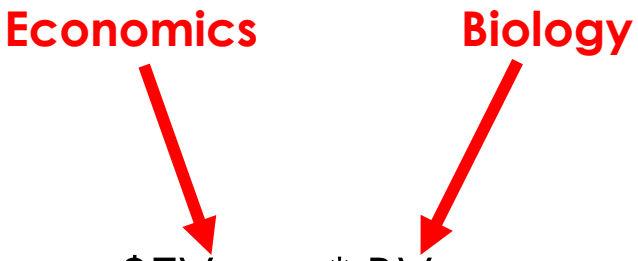
What are we talking about?



$$\$Index = \$EV_{Trait\ 1} * BV_{Trait\ 1} + \$EV_{Trait\ 2} * BV_{Trait\ 2} + \$EV_{Trait\ 3} * BV_{Trait\ 3} + \ldots..$$

e.g. Trait 1 = nlb

e.g. Trait 2 = LW8

e.g. Trait 3 = EWT

Why review?

- **Economics change**
  - Overall value of genetic gain increases in $ terms - increased lamb prices by 25% and costs.
  - Sometimes economic balance of traits changes (reduced wool price by almost 50%).
  - National production averages change.
  - SIL indexes are revised every 5 years, last revision 2017
- **Evaluation changes**
  - Meat Quality, Carla added
  - Remove wool DPW subindex from NZMW
  - No change made to base year (previously signalled as possibly required)
- **New approaches/refinements investigated where relevant**
  e.g. considered non-linear approach for FE.

Review process

- AbacusBio conducted the review
- Index outcomes reviewed by:
  - BLG team
  - 2 x industry consultation meetings (on-line, ~ 30 - 40 breeders invited to contribute)
  - Sheep Genetics Advisory Group made a thorough review.

Neville Jopson

Cheryl Quinton

- Several changes were made as a result of consultation (e.g. adult ewe weight penalty revised, linear FE retained)

Maternal index

What changes will you see?

1. **Changes in the value of genetics**
2. Changes in ranking
3. Changes in selection response

2022 NZMW Example Values

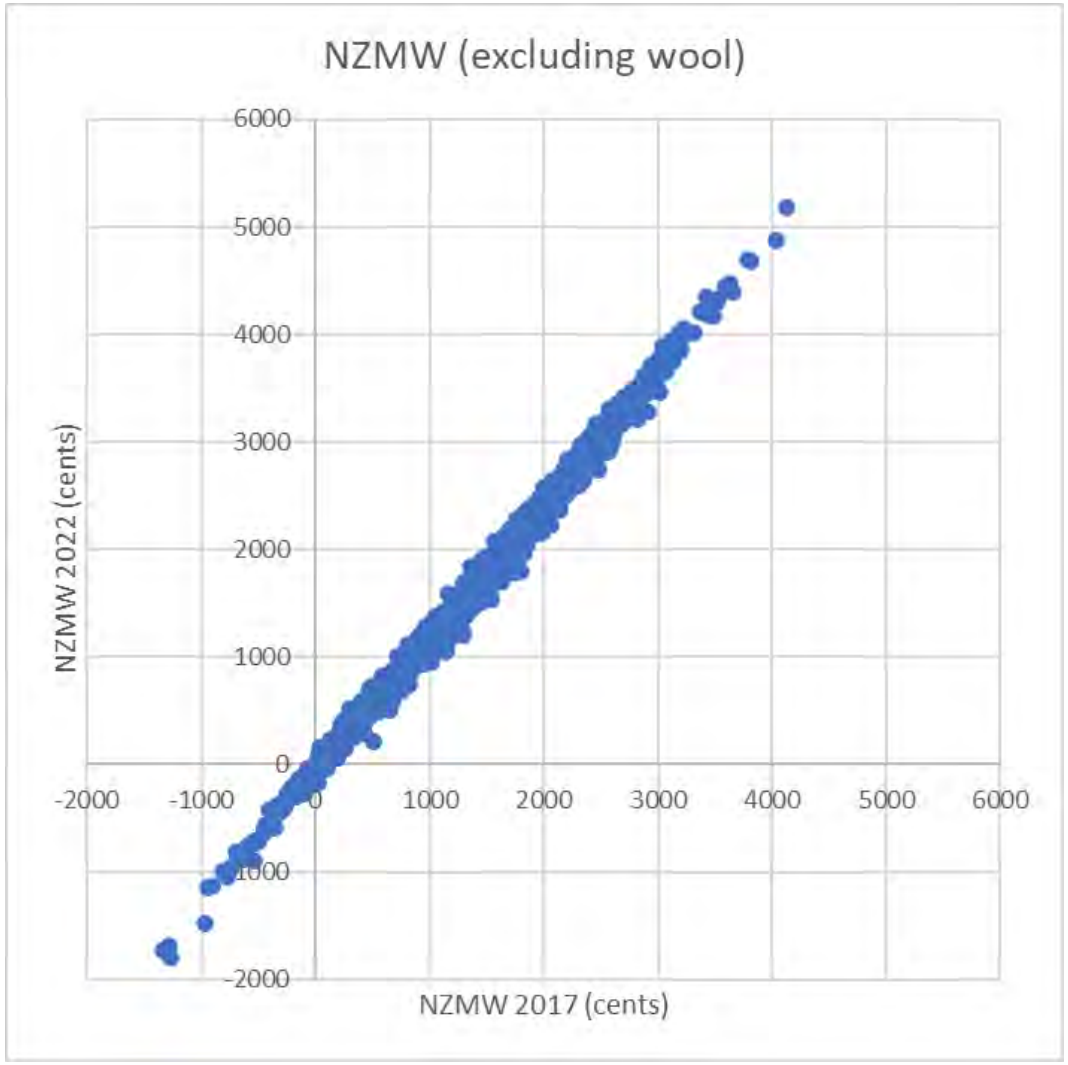
- Average new index values increase ~190 cents/ewe lambing
- Top 10% index values increase ~420 cents/ewe lambing

Ram ranking group	Proven Rams NZMW 2017	Proven Rams NZMW+DPW 2022	Proven Rams NZMW 2022
Top performer ram	3263	3850	3752
Above average ram	2265	2638	2563
Average ram	1551	1795	1746

What changes will you see?

1. Changes in the value of genetics
2. **Changes in ranking**
3. Changes in selection response

Ranking based on NZMW 2017 and 2022



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SHEEP BREEDER ROADSHOWS

2022 NZMW Ranking

- Rankings very similar
- Correlation between 2017 and 2022 indexes approx. 0.98 in proven rams, 0.99 in young rams

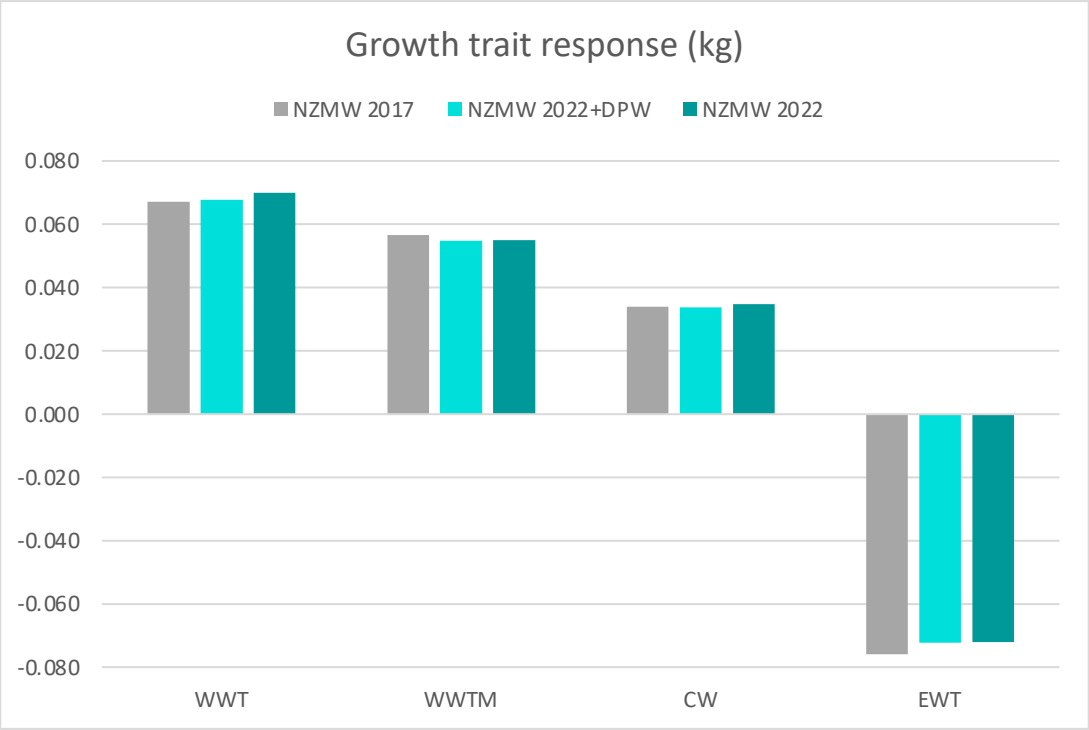
2022 Index	Correlation with 2017
NZMW	0.978
NZMW + Wool *	0.992
NZMW + Meat	0.980
NZMW + Twinning	0.978
NZMW + Hogget Lambing	0.979
NZMW + FEC	0.978
NZMW + Resilience	0.978
NZMW + Dag	0.978
NZMW + Facial Eczema	0.988
NZMW + BCS	0.966
NZMW + Wool Fibre Diameter	0.977
NZMW + Wool Colour	0.978

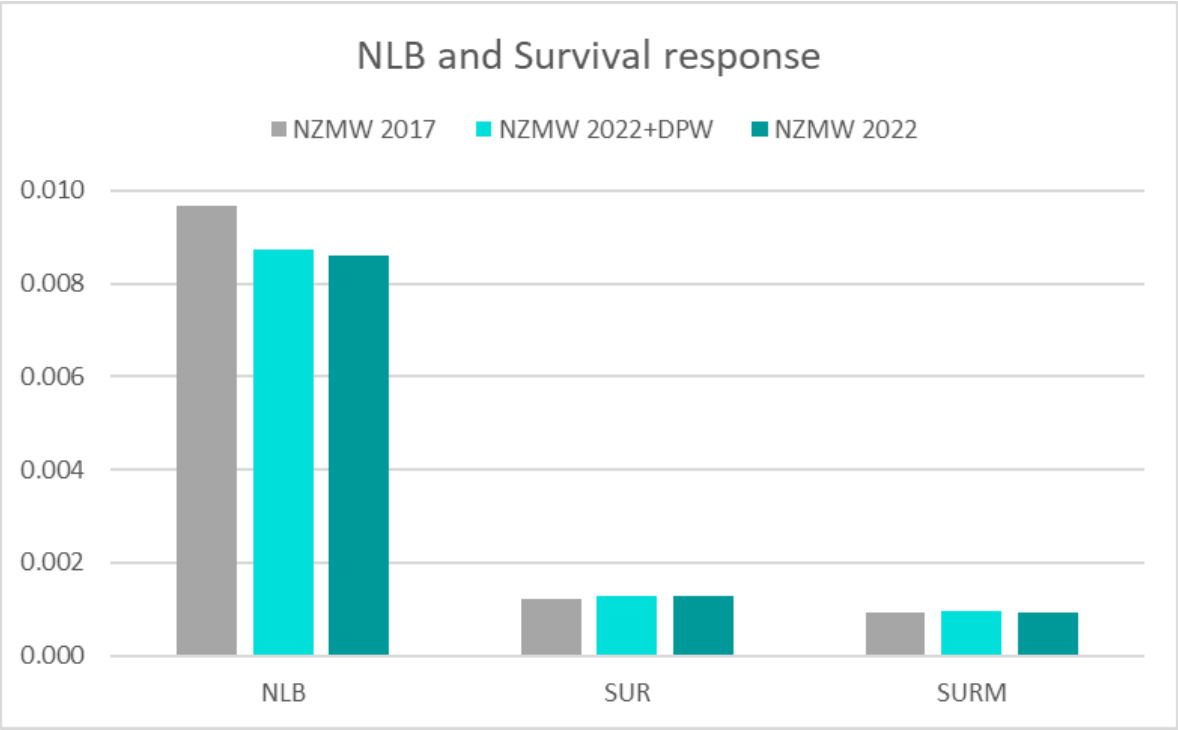
What changes will you see?

1. Changes in the value of genetics
2. Changes in ranking
3. **Changes in selection response**

Selection Response: Growth, NLB, Survival

- Predicted responses to 100 cent gain in NZMW (approx. 2 years)





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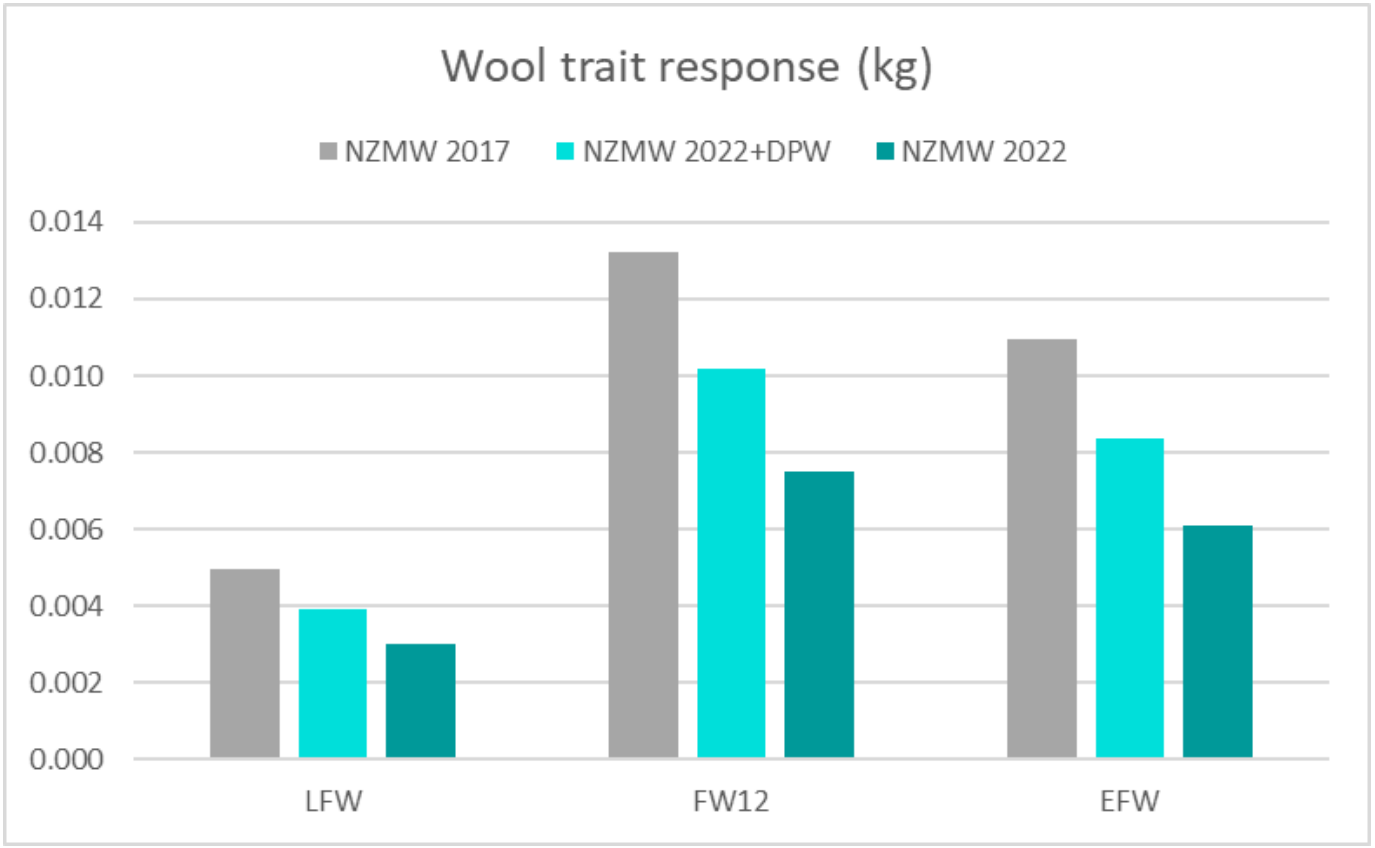
SHEEP BREEDER ROADSHOWS

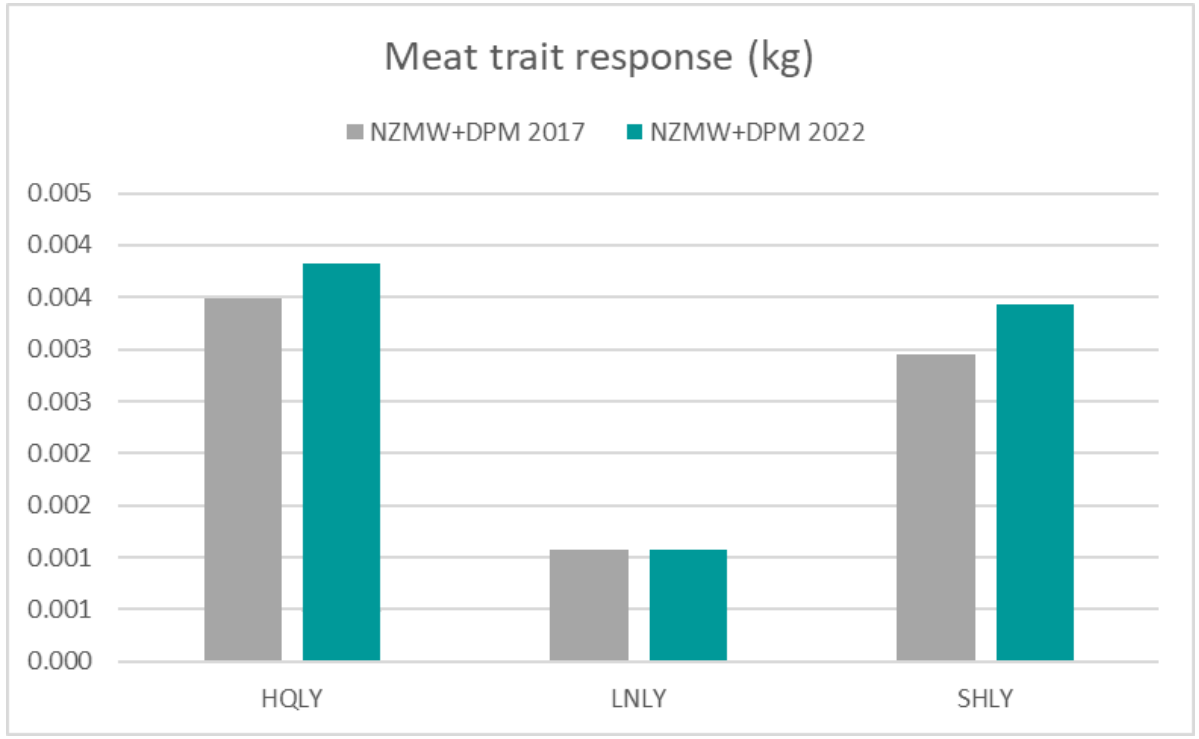
Selection Response: Wool

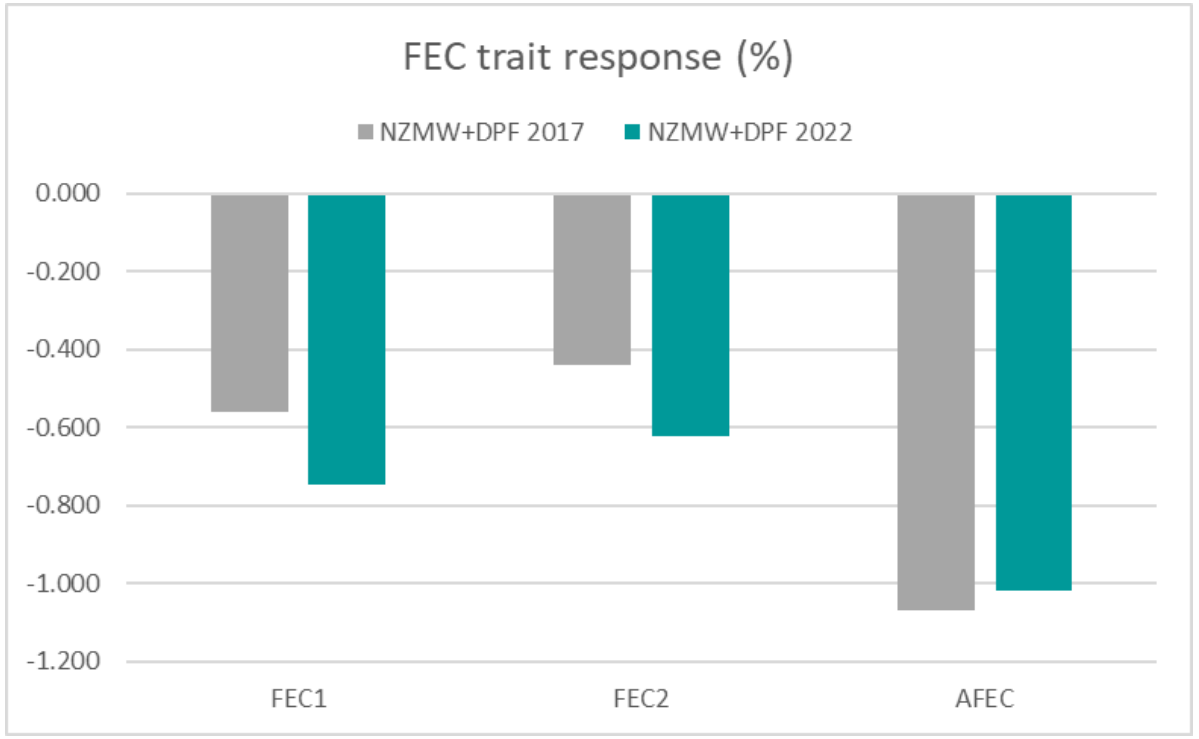
- Predicted responses to 100 cent gain in NZMW (approx. 2 years)



Selection Response: Meat, FEC

- Predicted responses to 100 cent gain in NZMW (approx. 2 years)





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SHEEP BREEDER ROADSHOWS

New traits: Bare Points and CARLA

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SHEEP BREEDER ROADSHOWS

Bare Points (DPB)

- Demand for animals that require less crutching and are less susceptible to flystrike
    - Dags valued in a separate sub-index DPD
- **Breech bareness** (BBREECH) valued on the reduction in fly strike treatment cost and reduced crutching
- **Belly bareness** (BBELLY) valued only on reduced crutching

CarLA (DPC)

- Carbohydrate Larval Antigen: Antibody response which prevents establishment of L3 parasite stage
- **CARLA** valued through genetic relationship to FEC1
- *Economic weight not independent of FEC, so should not be included in any index with DPF*

Terminal Index

2022 NZTW value ranges

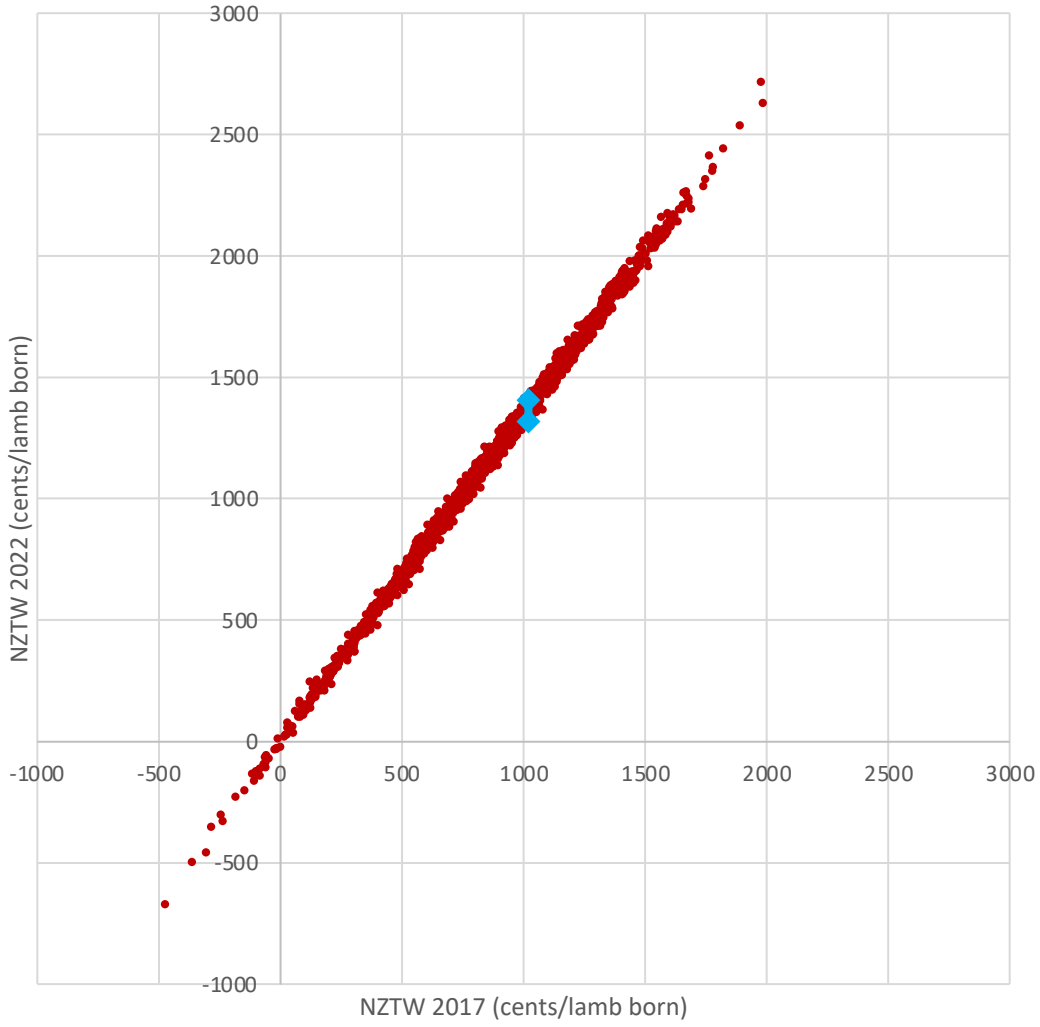
- Average new index values increase ~ 280 cents/lamb born
- Top 10% index values increase ~ 490 cents/lamb born

Top %	Proven Rams NZTW 2017	Proven Rams NZTW 2022
Top performer ram	1560	2093
Above average ram	1098	1488
Average ram	810	1102

Ranking based on NZTW 2017 and 2022

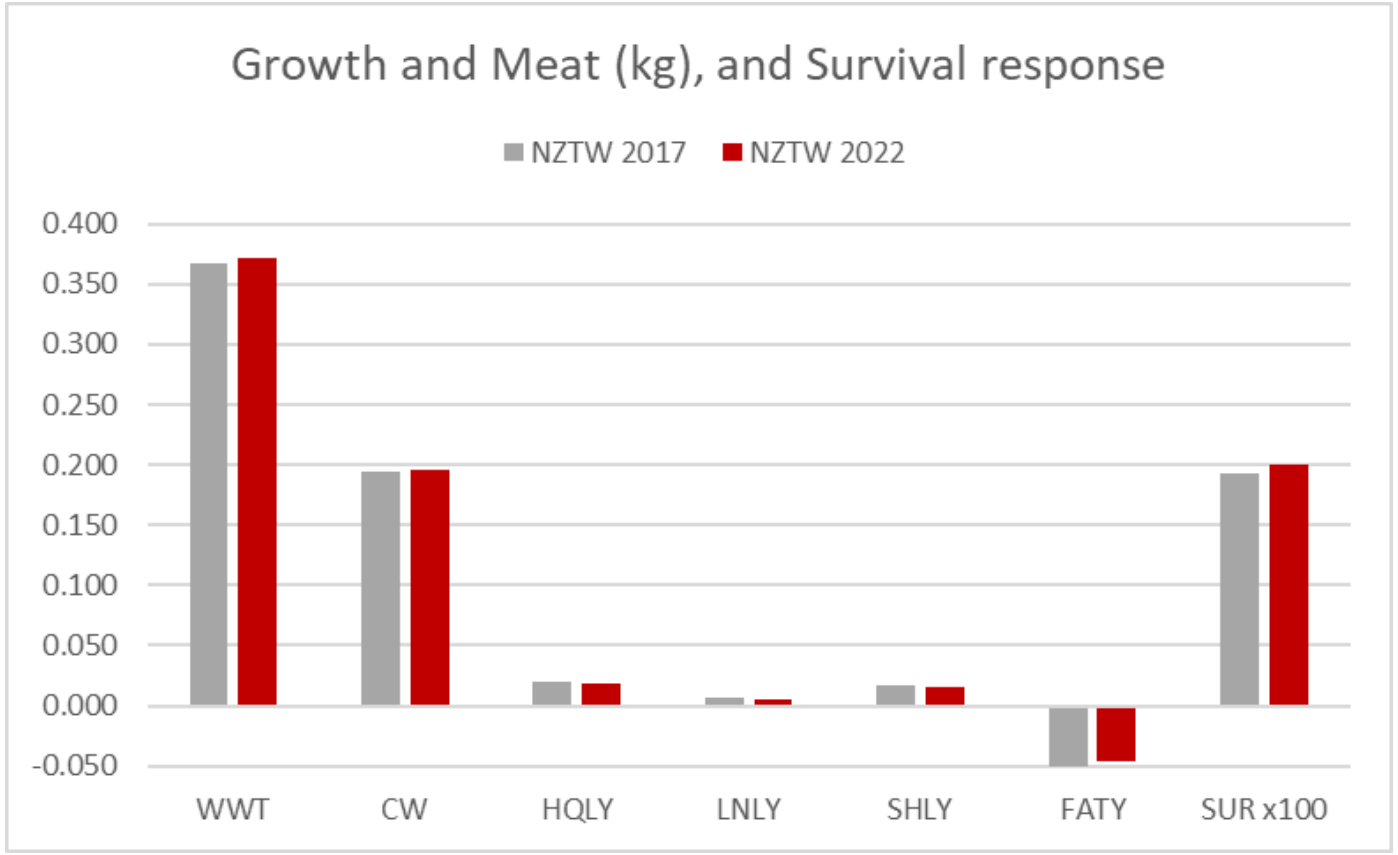
Rankings very similar

2022 Index	Correlation with 2017
NZTW	0.999
NZTW + FEC	0.998
NZTW + Dag	0.999



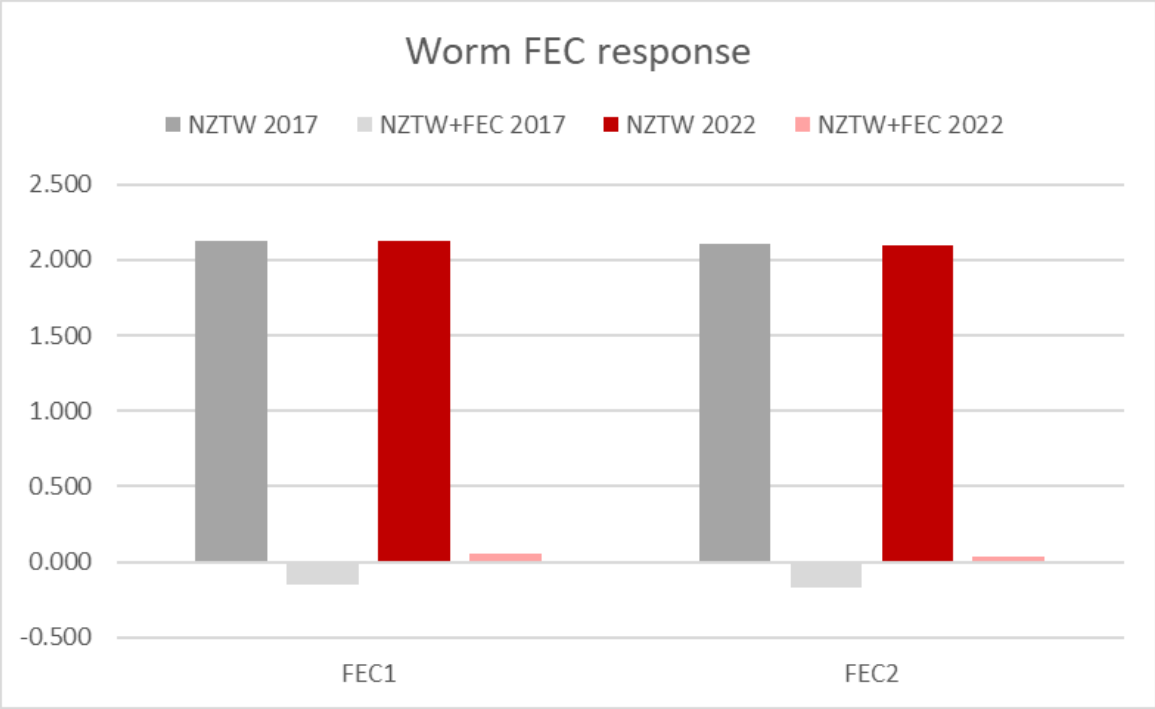
Selection Response: Growth, Meat, Survival

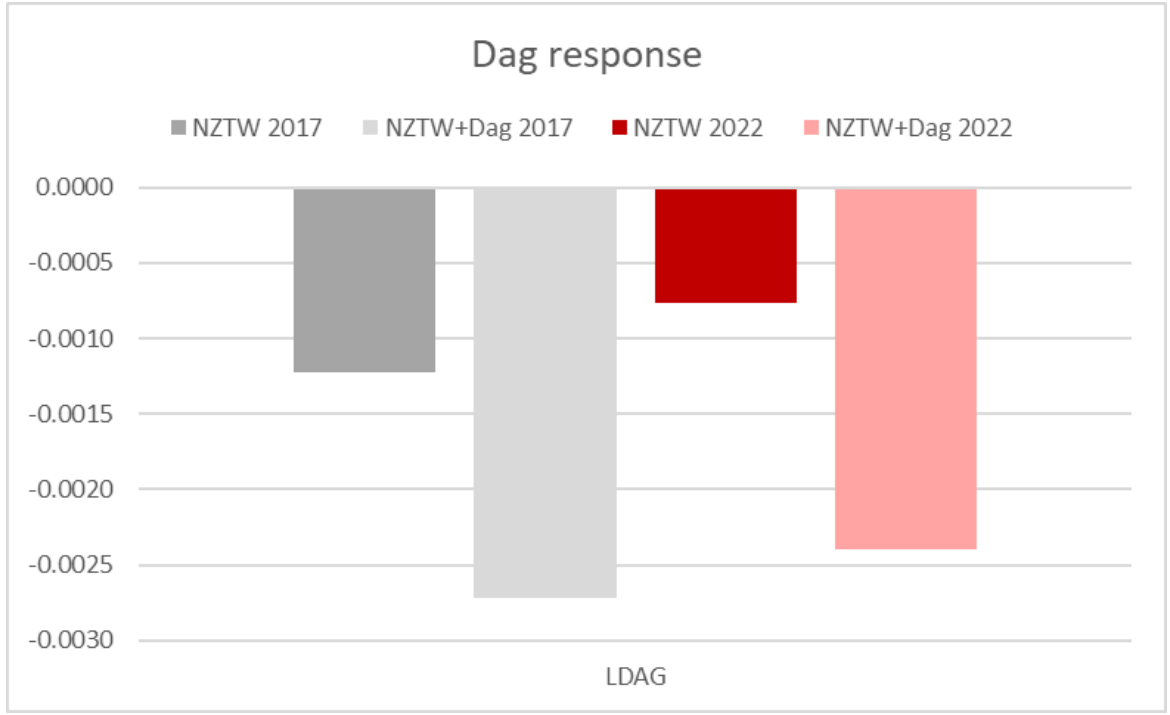
- Predicted responses to 100 cent gain in NZTW (approx. 2 years)



Selection Response: FEC, Dag

Predicted responses to 100 cent gain in NZTW (approx. 2 years)





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SHEEP BREEDER ROADSHOWS

New Traits: Meat Quality

Carcass marble score (CMARB)

- Visual score related to size and distribution of IMF
- Eating quality benefits up to 4% IMF, NZ average 2.7 ± 0.8%
- 10% premium for carcasses over threshold of 4% IMF, which relates to $0.74/kg CWT at current values
- Linear relationship between marble score and IMF

Meat shear force (SHF)

- Indication of tender meat. Tenderness is the highest ranked sensory attribute
- No current payment mechanism, managed by HACCP
- SHF threshold 8.0kg, current average 6.3 ± 1.9kg
- Premium based on a change in proportion of carcass that can be sold as high vs low value cuts
- SF influences pricing for 18% of carcass (mainly loin)
- Farmer receives only 50% of price signals relative to retailer

Meat Colour (a*: COLA24)

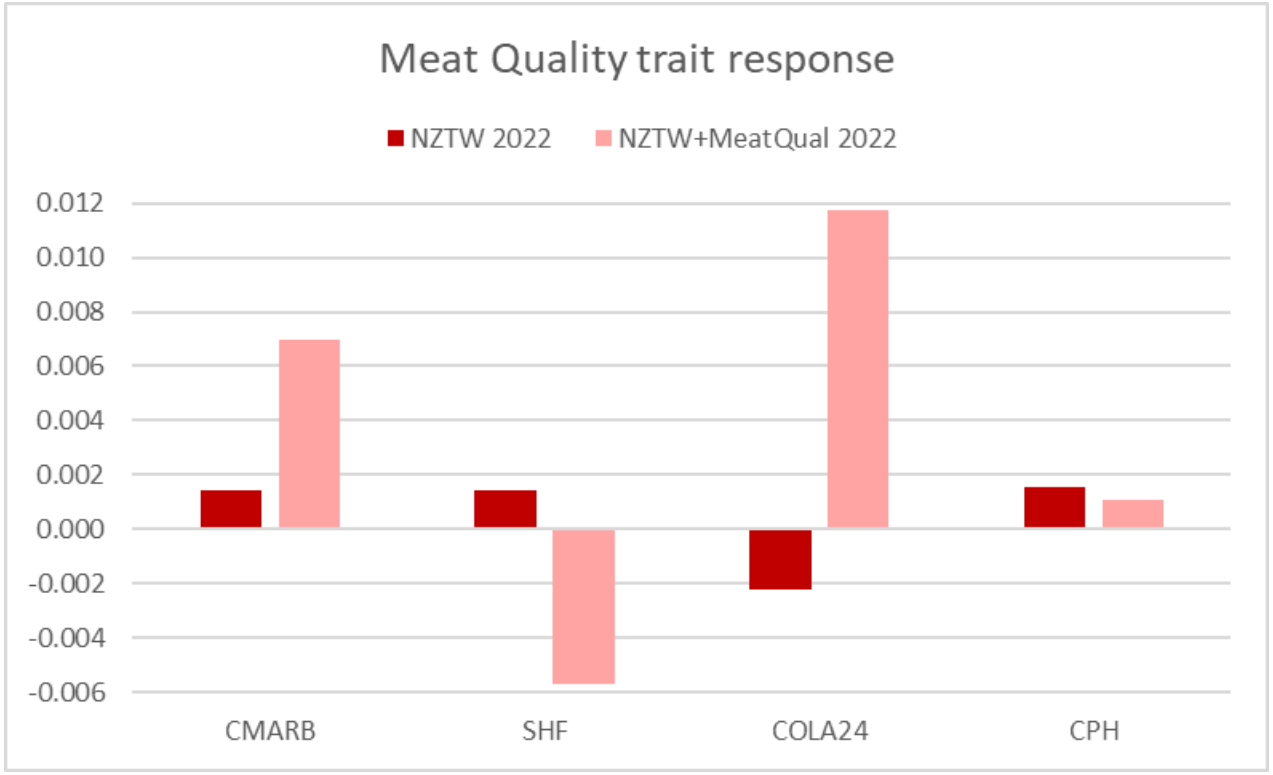
- Meat redness is perceived by consumers as freshness
- No current payment mechanism, managed by HACCP
- Threshold value based on estimated a* at 2.5 days post bloom with a* falling at 1.3 units per day
- A24 threshold where 95% of consumers find colour acceptable 14.5, current average 16.5 ± 2.26
- Payment of $0.05/kg CWT as brown meat requires reworking or discounted price
- 5% of carcass sold at discount after 2.5 days
- 30% discount applied to meat below threshold colour

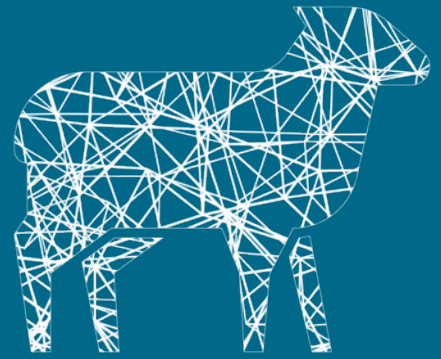
Meat pH (CPH)

- Impact of pH complex – e.g. impacts colour, tenderness, shelf life
- Valued on proportion of carcass at risk of DFD (dark, firm & dry) estimated for loin, with correlated responses in blade and knuckle
- Threshold value of 6.0, current means 5.79, 6.06 and 6.12 for rack, knuckle and blade
- Penalty for high pH meat valued at $0.74 per kg CWT

Meat Quality Subindex (TSMQ)

- Carcass Marbling (CMARB)
- Shear force (SHF)
- Meat colour (COLA24)
- Carcass pH (CPH)





Industry Facing Tools

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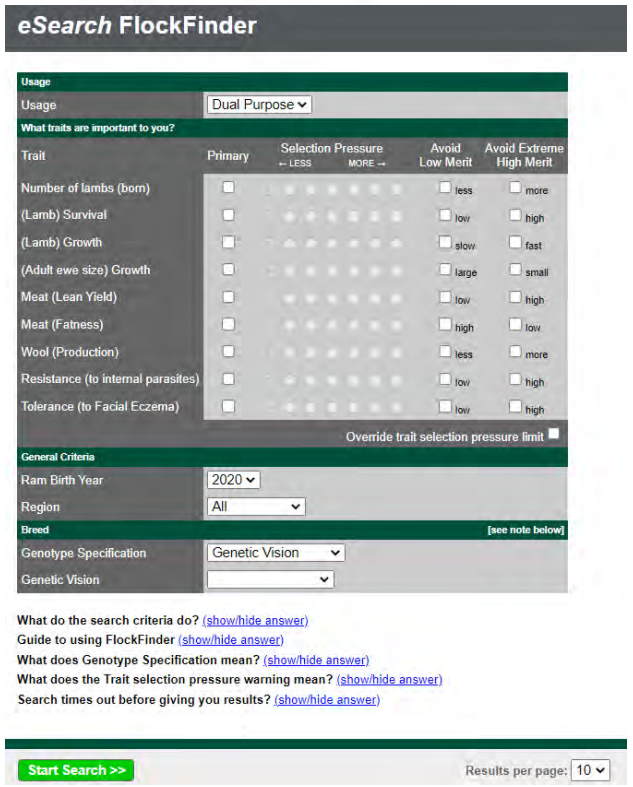
Industry Facing Tools

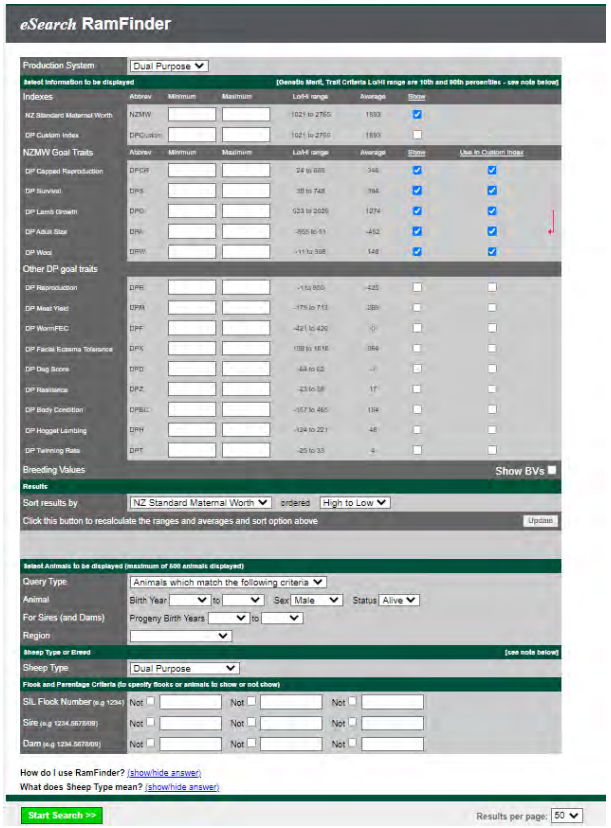
- Index updates needed/cost
- Transitioning to nProve
- Commercial farmer focus
- **Breeder features**

Industry Facing Tools

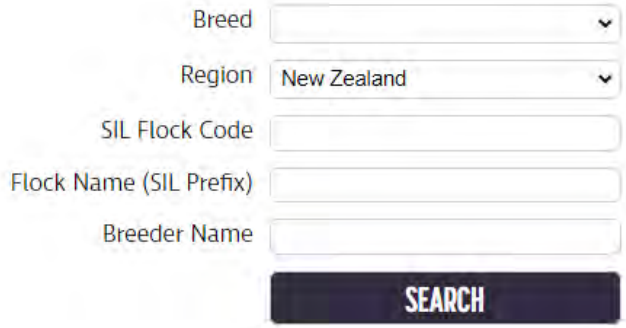
FlockFinder



RamFinder



BreederFinder



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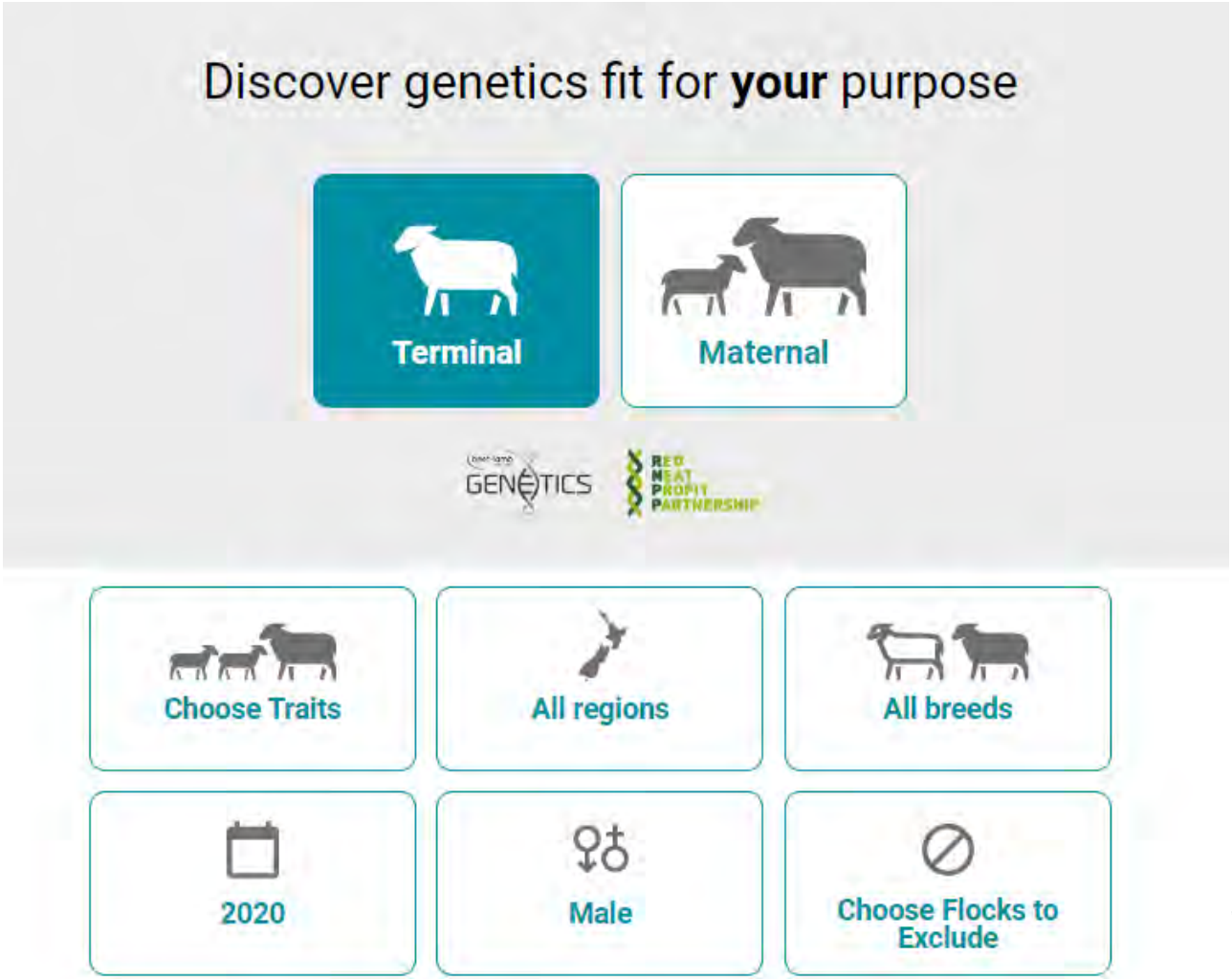
SHEEP BREEDER ROADSHOWS

Industry Facing Tools

nProve™

Go to: **nprove.nz**



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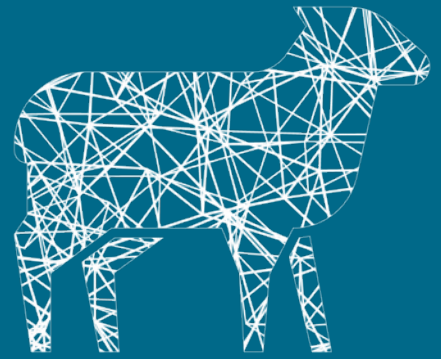
Timing

24th August - Index updates rolled out

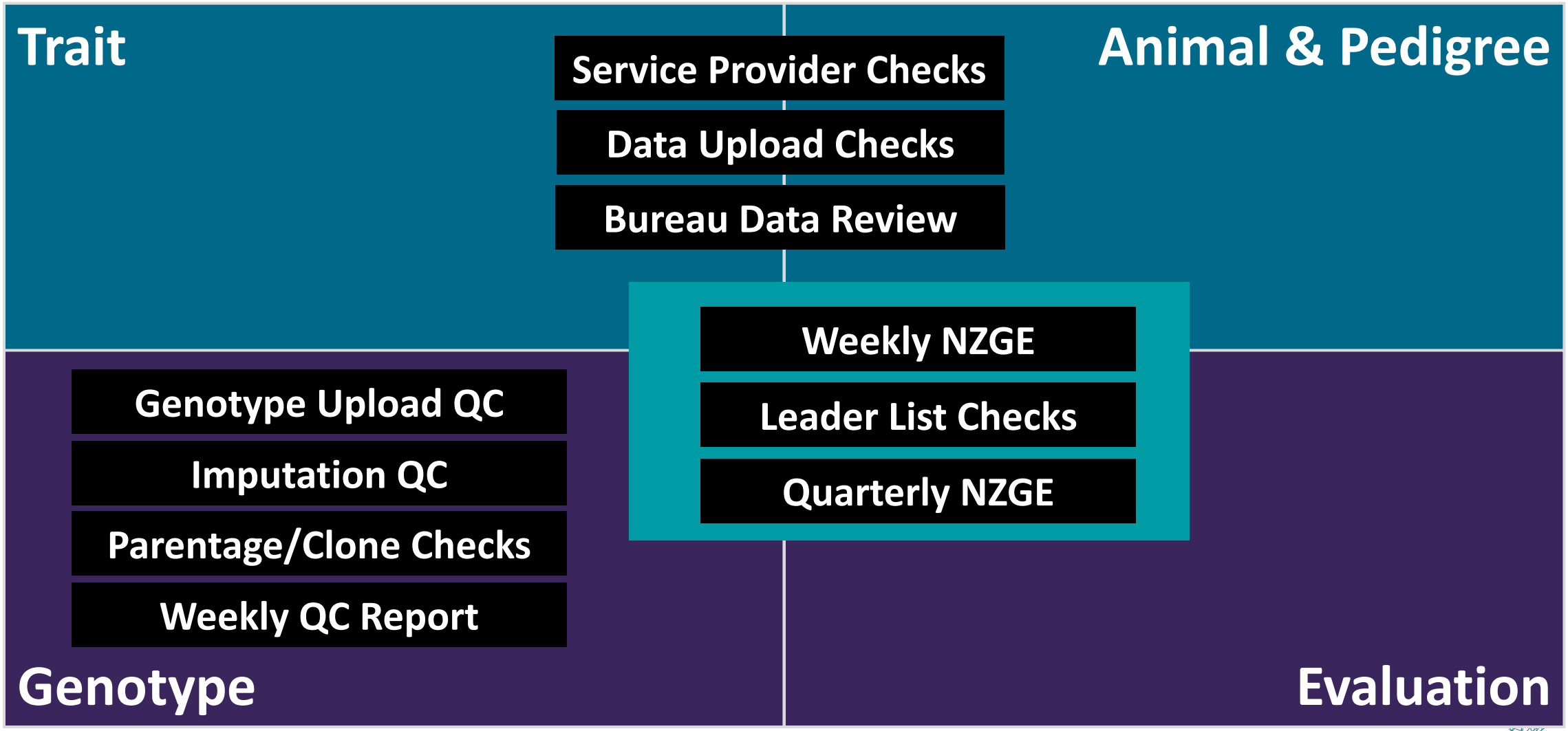
24th August – RamFinder, FlockFinder and BreederFinder retired

September – nProve updates



NZGE Quality Controls

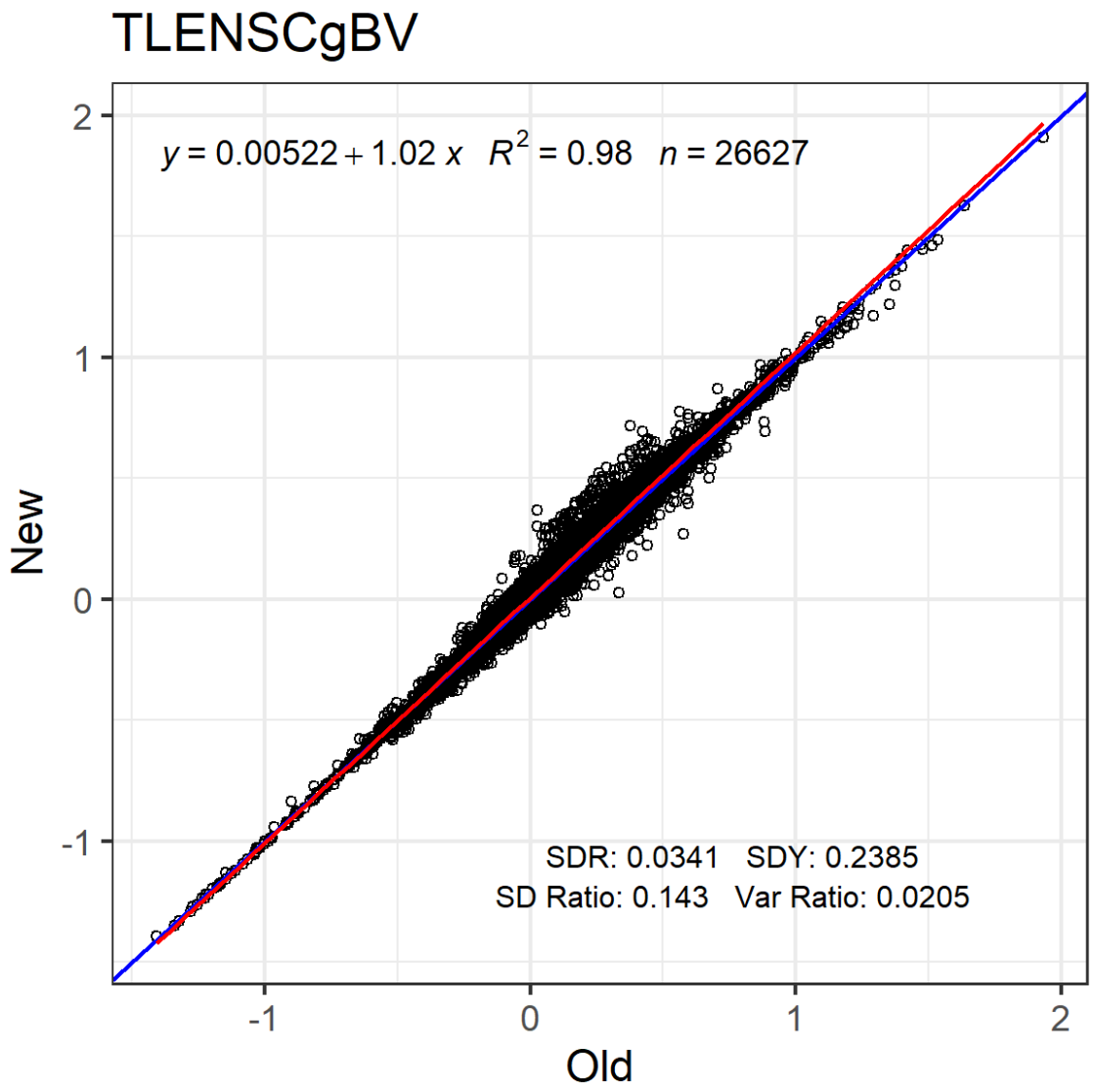
QC Checks


Trait
Animal & Pedigree
Service Provider Checks
Data Upload Checks
Bureau Data Review
Weekly NZGE
Leader List Checks
Quarterly NZGE
Genotype Upload QC
Imputation QC
Parentage/Clone Checks
Weekly QC Report
Genotype
Evaluation

Updated Genotype QC Process

- Pedigree data quality importance in NZGE
- Identified QC issues resolved
- Breeder informed

Weekly NZGE Checks



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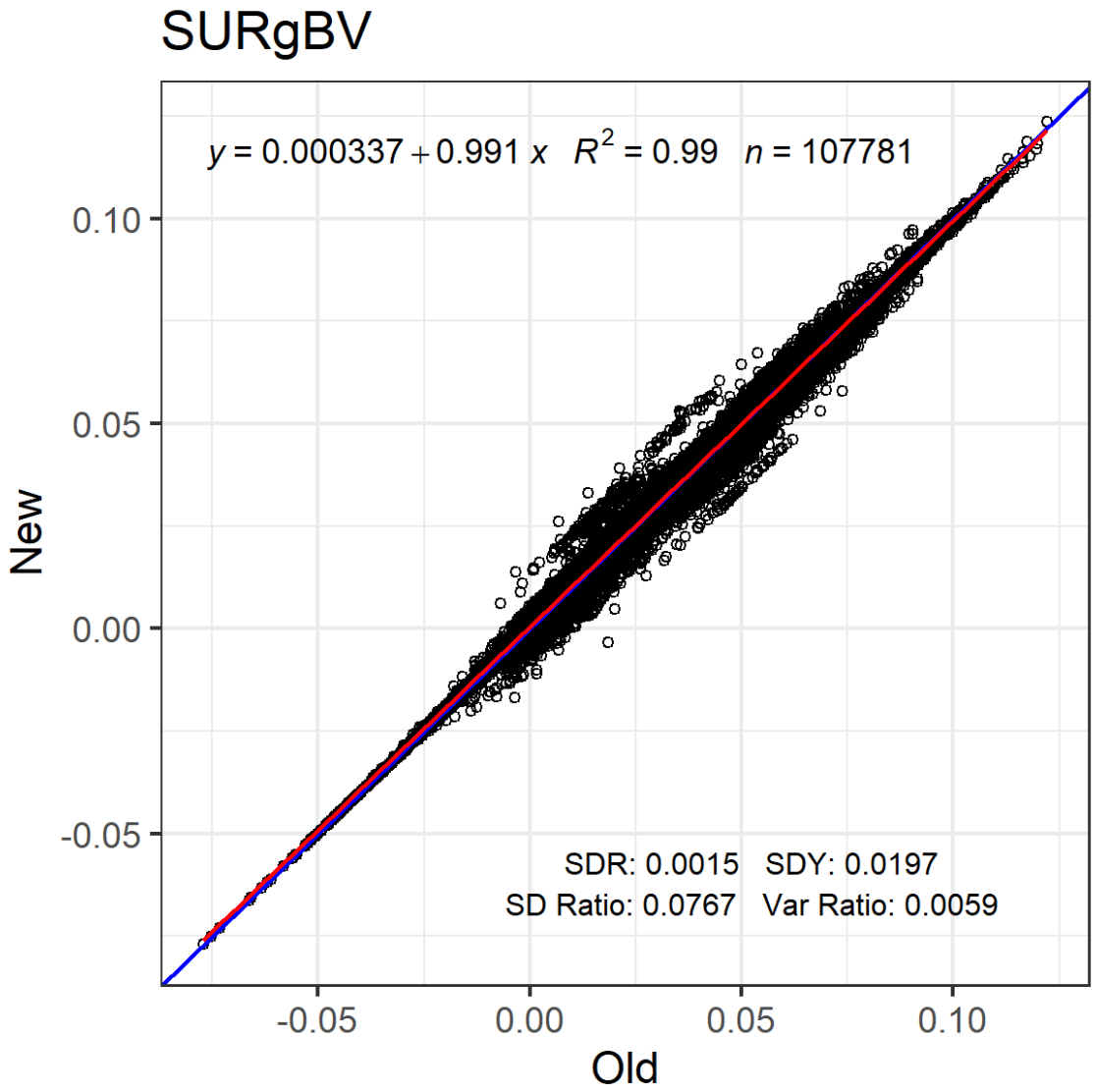
SHEEP BREEDER ROADSHOWS

Weekly NZGE Checks



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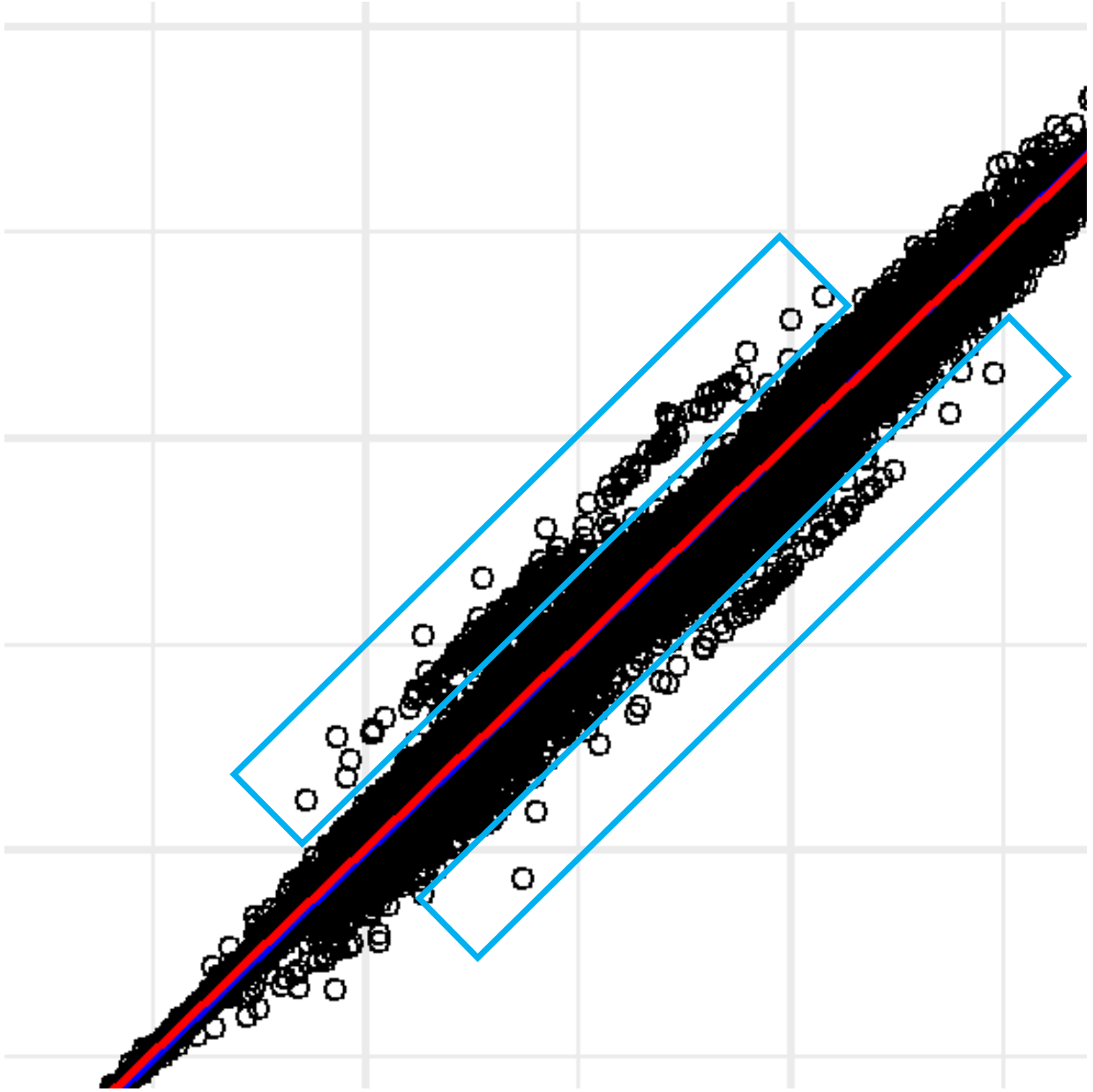
SHEEP BREEDER ROADSHOWS



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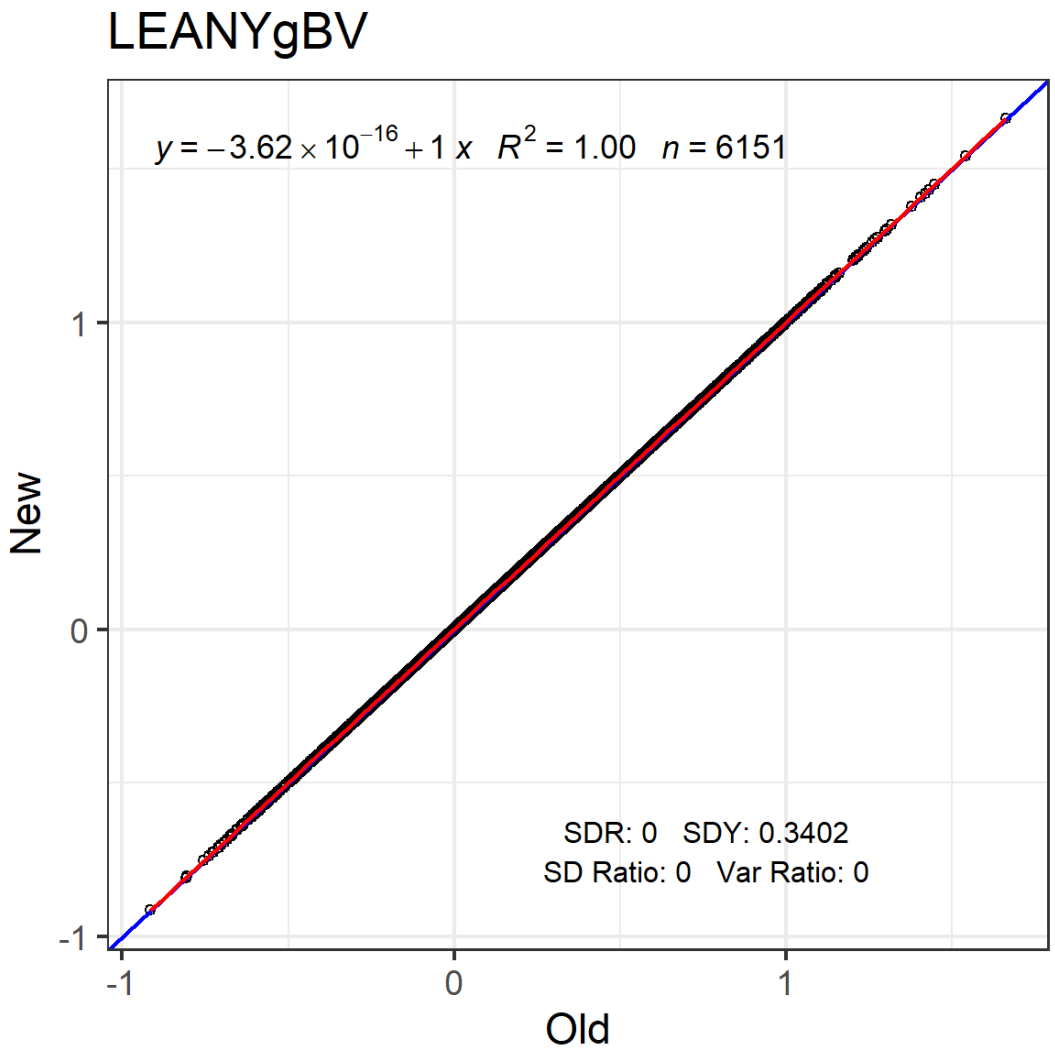
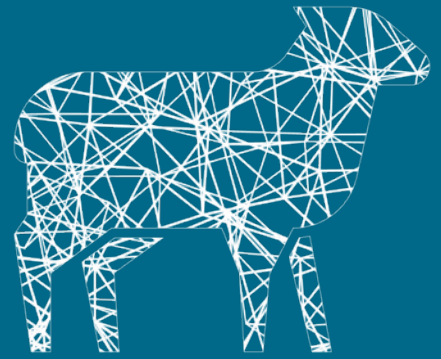
SHEEP BREEDER ROADSHOWS

Other Checks



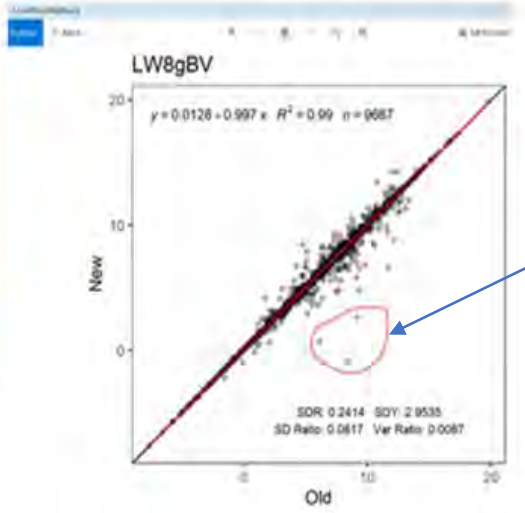


Data Quality Investigations

Problem solving – case study

ID	BirthYear	old LW8gBV	new LW8gBV	diff
[redacted]	2019	8.402093416	0.898032312	9.300125728
	2020	9.183193416	2.614467688	6.568725728
	2019	6.196893416	0.707977688	5.488915728

Over 900 LW6 measurements were loaded to SIL for this flock last week which may explain the shift in their BVs.



From NZGE tracking

Three sires have changed dramatically between the two runs – all in same flock

LW6 BVs changed
Sire 1. 8.4 to 0.89
Sire 2 9.2 to 2.6
Sire 3 6.2 to 0.7

Addition of LW6 data

Look at data - WWT

1. One weaning weight mob for all ram lambs

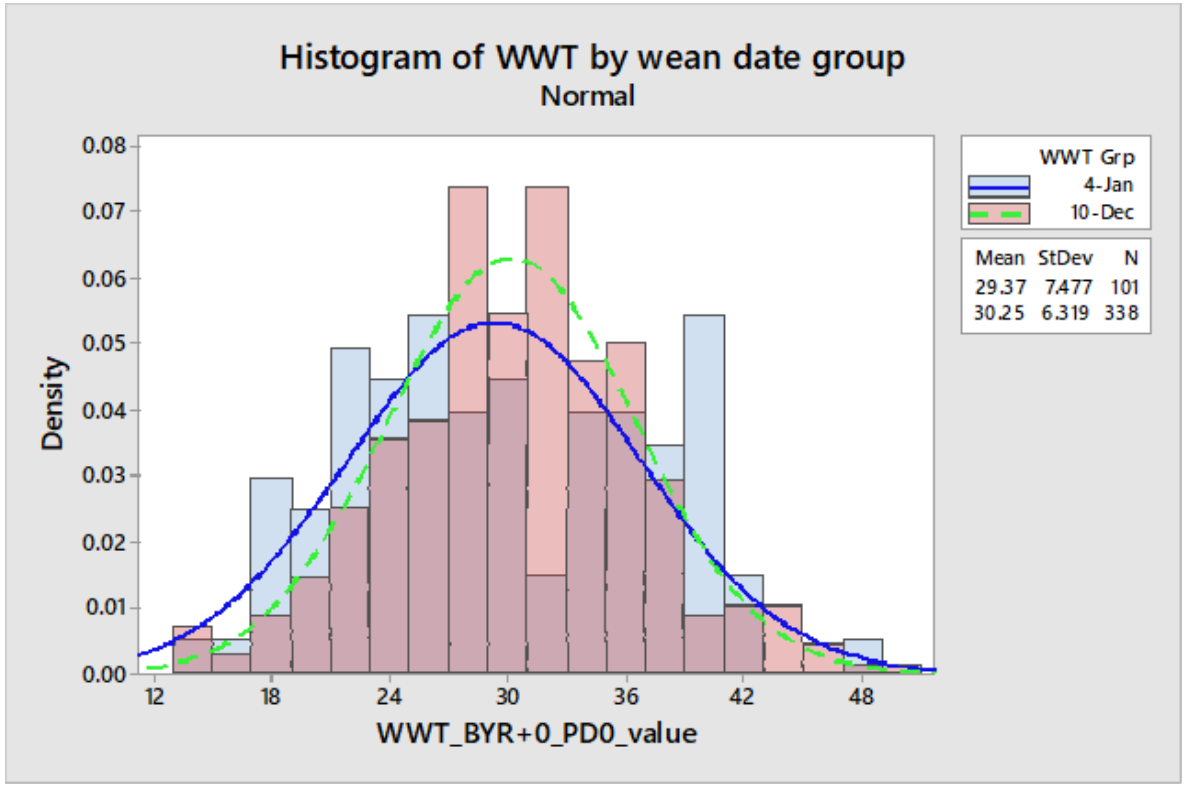
   Average was 29 kg

2. BUT different weaning dates 10/12/21 and 4/01/2022?

If have same mob- SIL compares as if one group all run together and compares against the mob mean

- does not then account for a difference in recording date

MOB 1: ram lambs weaning weights



Mob 1 but two dates
12th December and 4th January?

Birth dates
13/09/2021
5/10/2021

Age of Dam by weaning date
December wean - ewes
January wean - hoggets

Best practice – usually expect at least 3 mobs at weaning

Addition of LW6 data

All ram lambs in mob 1 to weaning mob =1

All ram lambs in mob1 at LW6 recording mob = 1

So- all animals have cg 1,1

SIL thinks all have been run together from birth to WWT and then WWT to LW6 recording

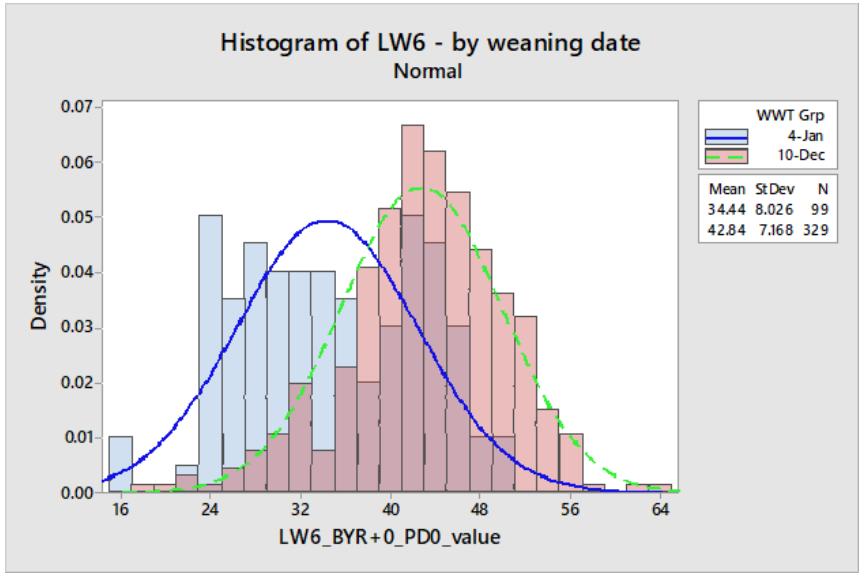
-so can compare all the animals directly with no mob correction.

Lambs born to ewes gained 12kg from weaning to LW6 (50days)

Lambs born to hoggets gained 5kg from weaning to LW6 (30 days) -

Why did the three rams change so much?

- Three sires were mated mostly to hoggets
- Good weaning weights - born later so predicted high WWT and LW6 BVs based on mob 1 coding



From Weaning to LW6

- Hogget lambs gained 5kg
- Lambs born to ewes gained 12kg so LW6

SIL thinks all run together wwt to LW6 (all mob1) – so progeny and sire recalculated to be much lower merit as LW6 values low

Correction

2 mobs at weaning

2 mobs at LW6

Lambs from ewes 1,1 mob sequence

Lambs from hoggets 2,2 mob sequence

One sire was mated across both ewes and hoggets, so a between mob correction could be calculated.

BVs corrected for mob

Sire	LW6 BV Predicted from wwt	LW6 BV After LW6 data added	LW6 BV After mob correction
Sire 1*	9.2	5.2	7.8
Sire 2	8.4	-0.9	4.7
Sire 3	6.2	0.71	5.7

* had some progeny born to ewes

Inaccuracies in mobs (cg) can lead to big errors in BVs and poor selection decisions

Auto fix?

Warning in SIL

2021	WWT	R	1	2021	119	16/12/2021
2021	WWT	R	2	2021	54	16/12/2021

But not all bureaus may fix or all breeders give correct information to allow fix.

Auto fix? If different recording date, make a separate mob?

BUT- can be different mobs on same day so would not pick up these? ***Would breeders and bureaus then be more lax thinking SIL will take care of it for them and we just get a different problem?***

Other issues found

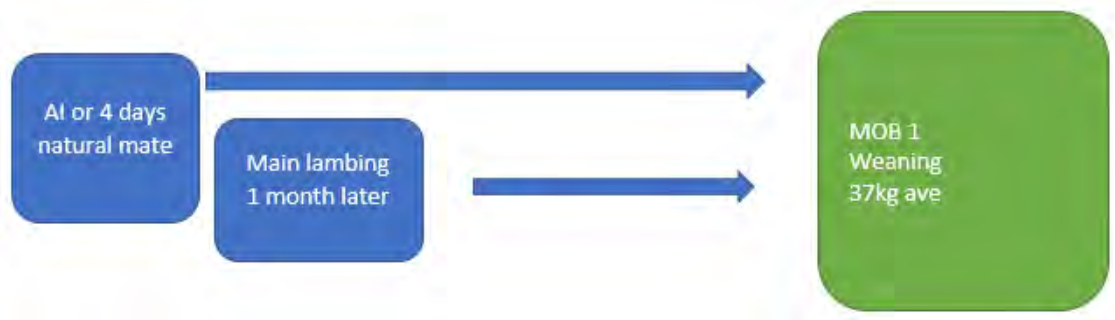
Poor date of birth records – often more an issue with genotyping flocks

Inaccurate pedigree – recorded pedigree then genotyped and not by recorded sire. Halved the survival BV for an outside sire and his relatives.

Separated lambing groups -Link sire/AI a month a head of main

Separated lambings (or hoggets)

Link/AI sires – lambed 3-4 weeks before main ewes



All lambs corrected to the average birth date of the whole mob.

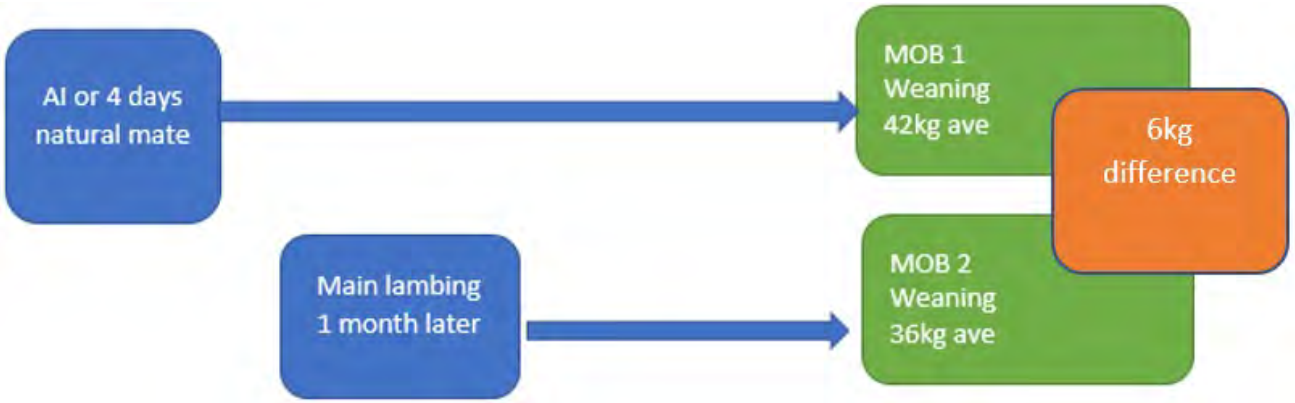
What were conditions like for the two different lambings ?

- Weather?
- Impact on survival
- Growth rates
- Feed - quality and quantity?

Unlikely to be the same

Separated lambings (or hoggets)

Link/AI sires – lambed 3-4 weeks before main ewes



6 KG diff at weaning

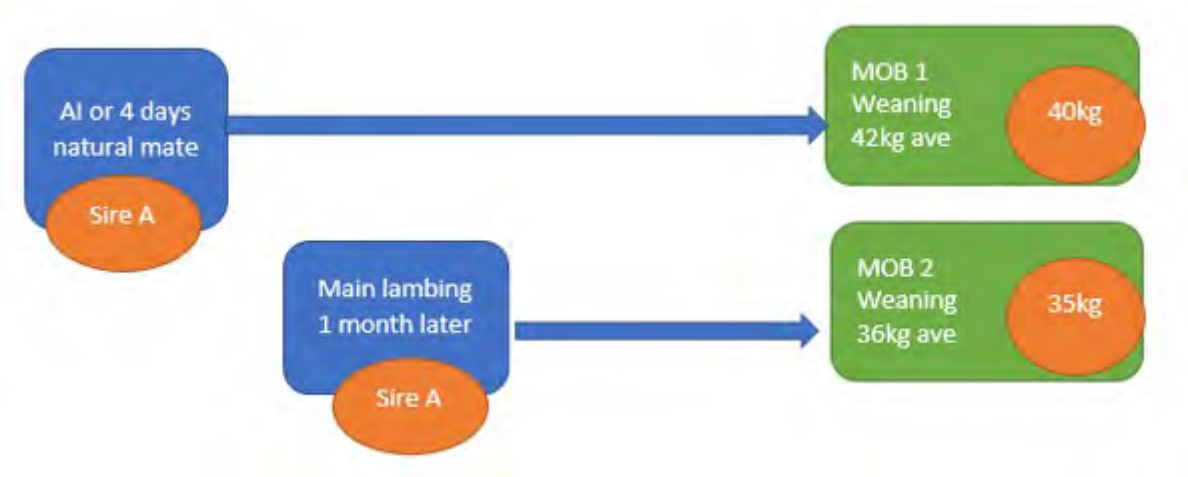
BUT are the rams used early better, similar or worse for Growth than the later home bred ones?

Can't tell!

Can't separate environment from genetics.

Separated lambings (or hoggets)

Link/AI sires – lambed 3-4 weeks before main ewes



Environmental/management correction is 5kg

So can correct for early lambing and reflect the genetic merit of the sires relative to the later sires (usually mostly homebred). Also correct for survival etc

Without correction may push own sires down!

If outside sires the data is used for benchmarking your flock – want it to be accurate!

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SHEEP BREEDER ROADSHOWS

Connectedness – a bit like mobs really

Across years

2021

2022

Across ewe ages

Across mobs

Across flocks

Connectedness – a bit like mobs really

Across years

Across ewe ages

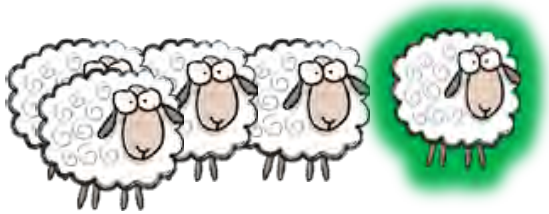
Across mobs

Across flocks

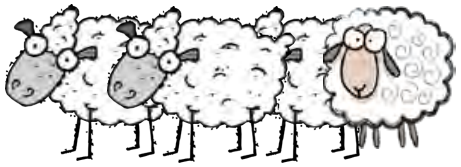
Connectedness – a bit like mobs really

Across years

2021



Across ewe ages



Across mobs

Across flocks

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Connectedness – a bit like mobs really

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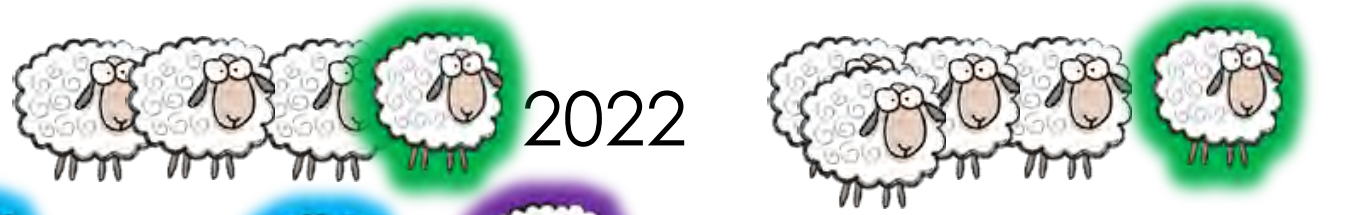


Across ewe ages

Across mobs

Across flocks

Connectedness – a bit like mobs really

Across years **2021** 22

Across ewe ages

Across mobs

10 progeny of same sire (by sex)

Across Flock

Minimum recommendation – every second year

Connected to main NZGE group

Regular and more is better for accurate benchmarking

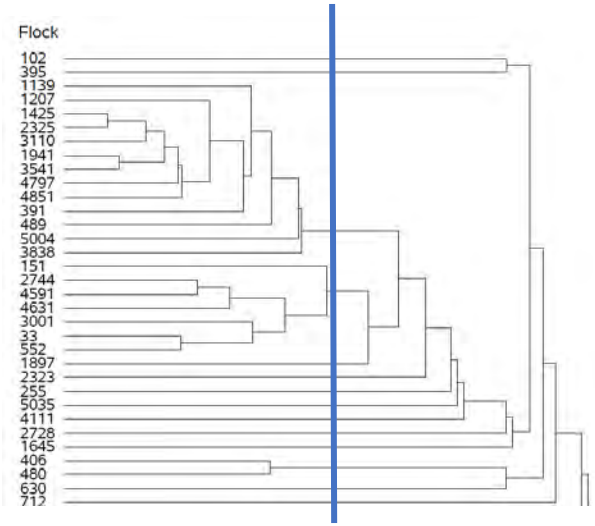
Need 30 connected & measured progeny in the three 3 year window.

(FE is reduced~ 16 over 3 years)

Common questions

Dropped suddenly but traffic light said was OK?

Connected via another flock that dropped out (tree diagram)

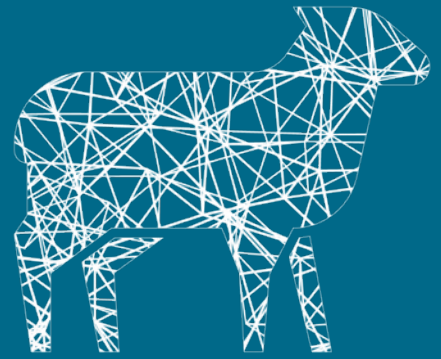


Connected for Survival but not for Reproduction?

Need 30 lambing records on connected ewes.

How come connected for Growth but not Meat?

Too few connected progeny measured



Methane Update

Methane Testing – where are we at?

- ~ 37 breeding flocks testing for methane plus 4 resource flocks
- 12 flocks connected for methane (+4)
- 35 flocks booked already for 2021-born

- Methane trailer in North Island from July
- Cost $35/animal, $20 offset from Beef + Lamb NZ (if animals genotyped)
- Consideration of a 2nd Methane trailer

www.methanebv.co.nz

nProve

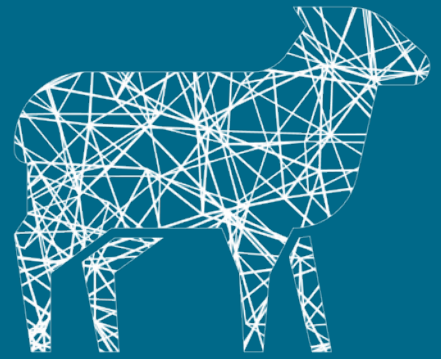
beef+lamb new zealand GENETICS

Protocol simplifications

- No repeat testing
- Roof on trailer

Going forward ...

- How does anyone get rewarded for improved methane?
  - Commercial farmer flock level EBVs
  - Genomic screening
- EBV format suitable for on-farm calculators
- Development of proxy measurement techniques
  - Rumen sample micro-biome
- Increase sire genotyping in the national breeding flock



What's in the pipeline?

Leader Lists

SILACE – source outside sire with confidence

Used to be the main evaluation checks – more sophisticated ones now.

They could be replaced in nProve with a better tool?

What else is coming

Visual Scores – have Dags, Bareness and Wool colour

Range of additional scores (feet, horns, bareness, etc)

No BVs but in nProve can show scores for young animals and then can accumulate raw scores by sire

- average

- range of scores

What else is coming

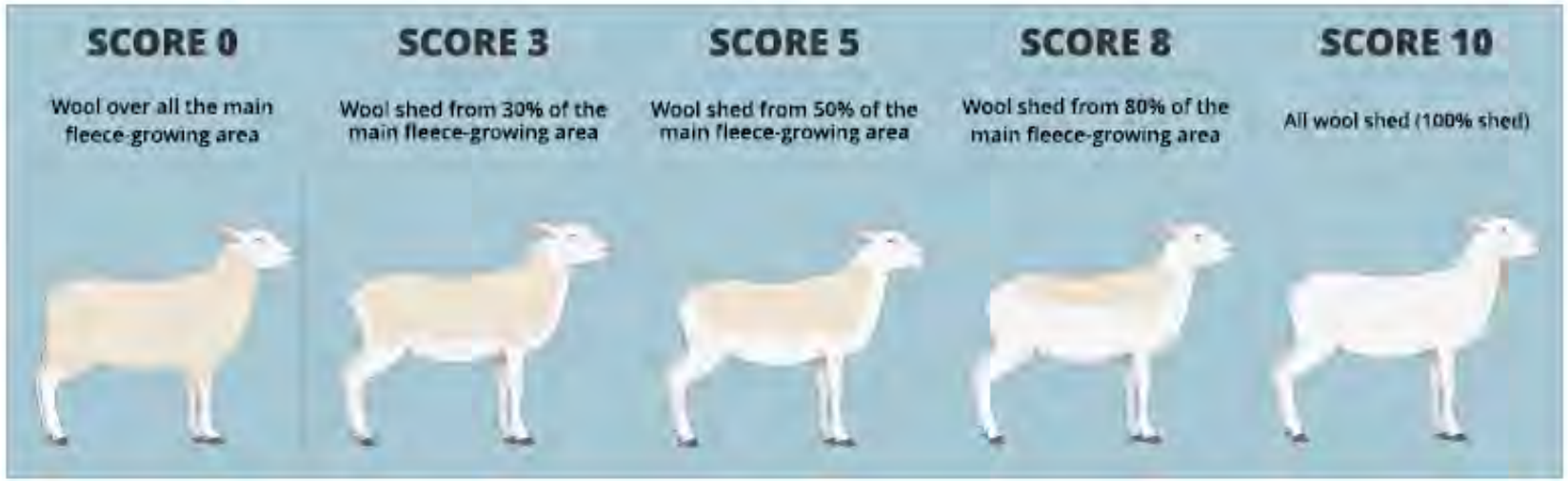
Shedding module

Standardised scoring system

Scored as lambs or 2tooths Dec-Feb

Roy Costilla (AgResearch)

WOOL SHEDDING – relates to the degree of fleece shedding	Trait Abbreviations = SHED & SHEDMA
When: Scored in January or February on lambs and ewes. **Record**: ID, Mob, Date and Scorer (if more than one). **Repeat:** Lambs: once-recorded as SHED. Ewes can be recorded annually (SHEDMA). **Scale:** 0 to 10. No half scores can be used. **What is scored?** Degree of fleece loss across the body expressed as a score.	**Description**: Shedding is desired in some sheep to avoid the cost of shearing. Animals need at least one copy of the shedding gene to initiate shedding, then a range of other genes control the pattern of shedding. Note: this is a separate trait to belly bareness **Reportable** Yes. **Breeding Value** Under development. A higher number indicates more shedding. **Index:** No.



DRAFT

What else is coming

- Terminal evaluation strategy
- Meat module (incl streamlining traits)
- Sheep Milking

What else is coming

Further improving the way genotypes are used in NZGE