

Guide to Analysis Changes



SHEEP GENETICS



Maternal LAMBPLAN changes

- What are the changes?
 - Across breed maternal analysis
 - Weaning scan breeding values
 - Use of repeated weaning weights
 - Updated reproduction model
 - Maternal indexes without NLW
- When are the changes?
 - June 15 Maternal LAMBPLAN analysis

Reporting ASBVs - now

Merinos

Merino
Poll Merino

Terminal Breeds

Poll Dorset
White Suffolk
Suffolk
Texel
Dorper
etc

Maternal Breeds

Border Leicester

Coopworth

Composite Maternal

East Friesian

Corriedale

SAMM

Dohne

Reporting ASBVs – from June

Merinos

Merino
Poll Merino

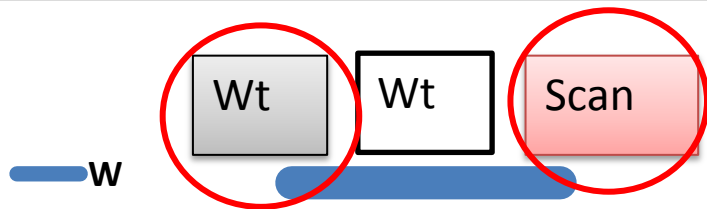
Terminal Breeds

Poll Dorset
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etc

Maternal Breeds

Border Leicester
Coopworth
Composite Maternal
East Friesian
Corriedale
SAMM
Dohne

Weaning scans & Repeated WWT



- Correlations

- WFAT with PFAT = 0.80

- WEMD with PEMD = 0.90

- Must be big enough to scan (average +30kg)

- Must have variation in fatness (average +3mm)

Reproduction Analysis

- Only information from flocks actively recording reproduction traits will be used
 - *Information from flocks with only WT or SC will no longer be used.*
- Correlations between NLW and WT / SC have been reduced
- Repro records from ewes lambing <1.5 yrs analysed and reported as separate traits
 - (YNLW / YNLB)

Why are these changes being made?

- Industry concern/lack of confidence
 - Most NLW breeding values stable
 - Some NLW breeding values were changing
- More accurate ASBVs require direct repro data
 - Correlations alone are not sufficient
 - Better repro recording = more accurate ASBVs

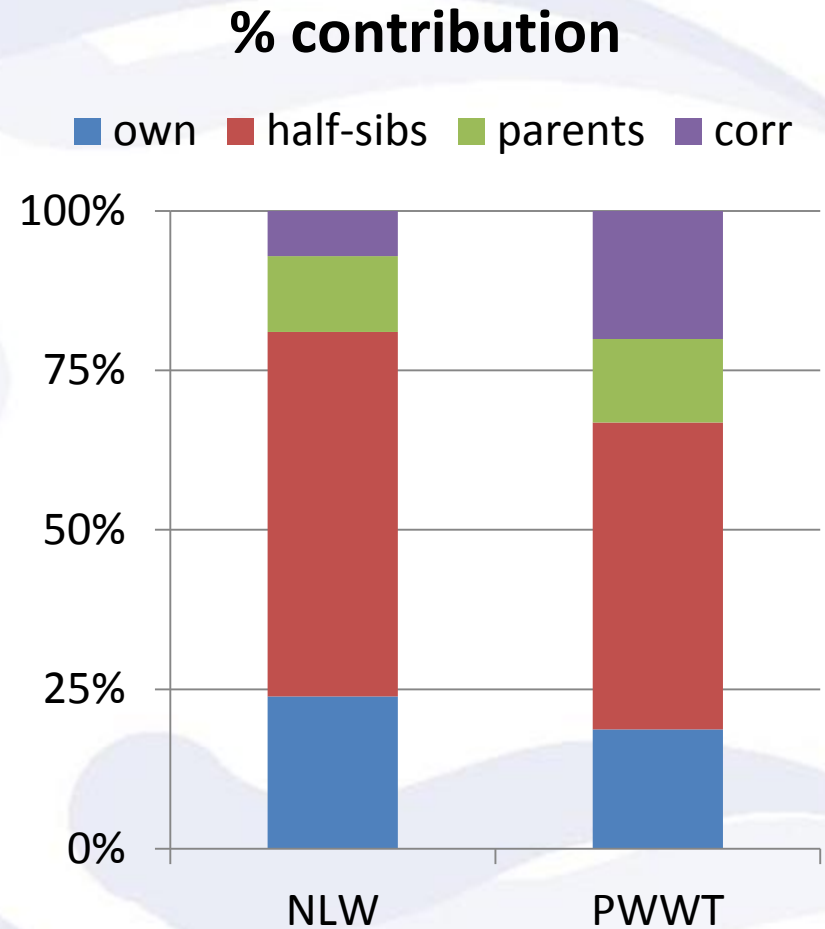
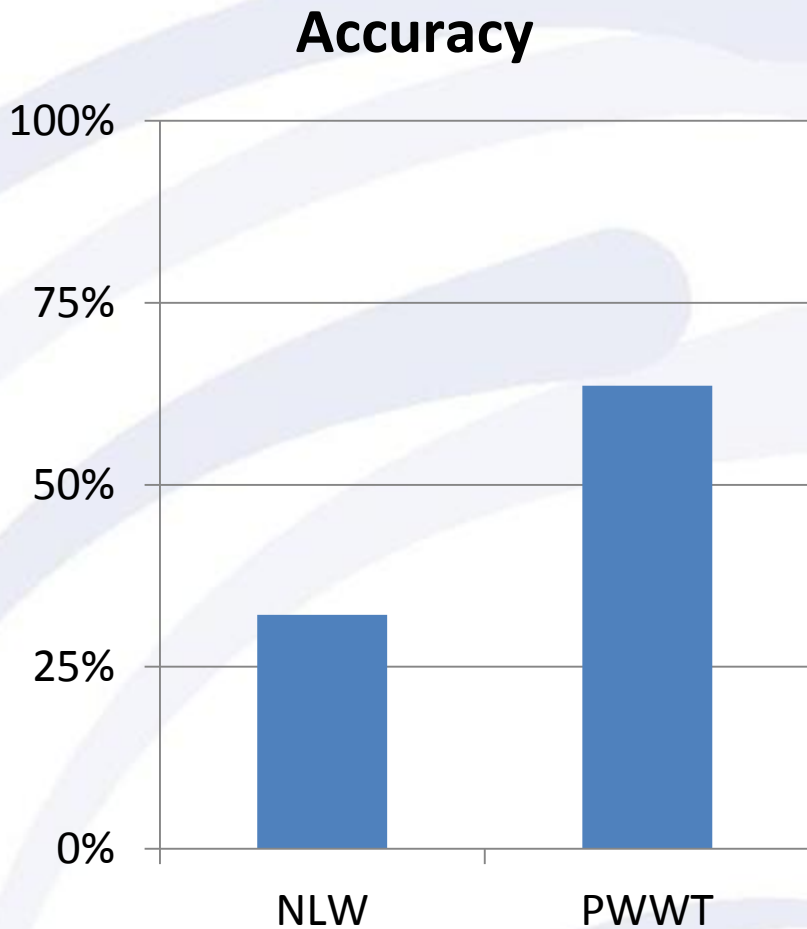
Why are accurate repro ASBVs difficult to achieve?

Production vs reproductive traits

	Production (eg WT)	Reproduction (eg NLW)
Heritability	Moderate-high	Low
Variability	Large-continuous range eg. 35- 55kg	Low – fixed points eg. 0,1,2
Direct recording	Entire drop	Selected females
Timing	Before selection	After selection
Correlated information	Lots – eg. wt, scan etc High impact	Few traits – eg. wt, SC Low impact
Management groups	Large	Smaller?
Complications	Relatively few	Mating types Fertility failures Yearling vs adult Variable joining practices etc etc

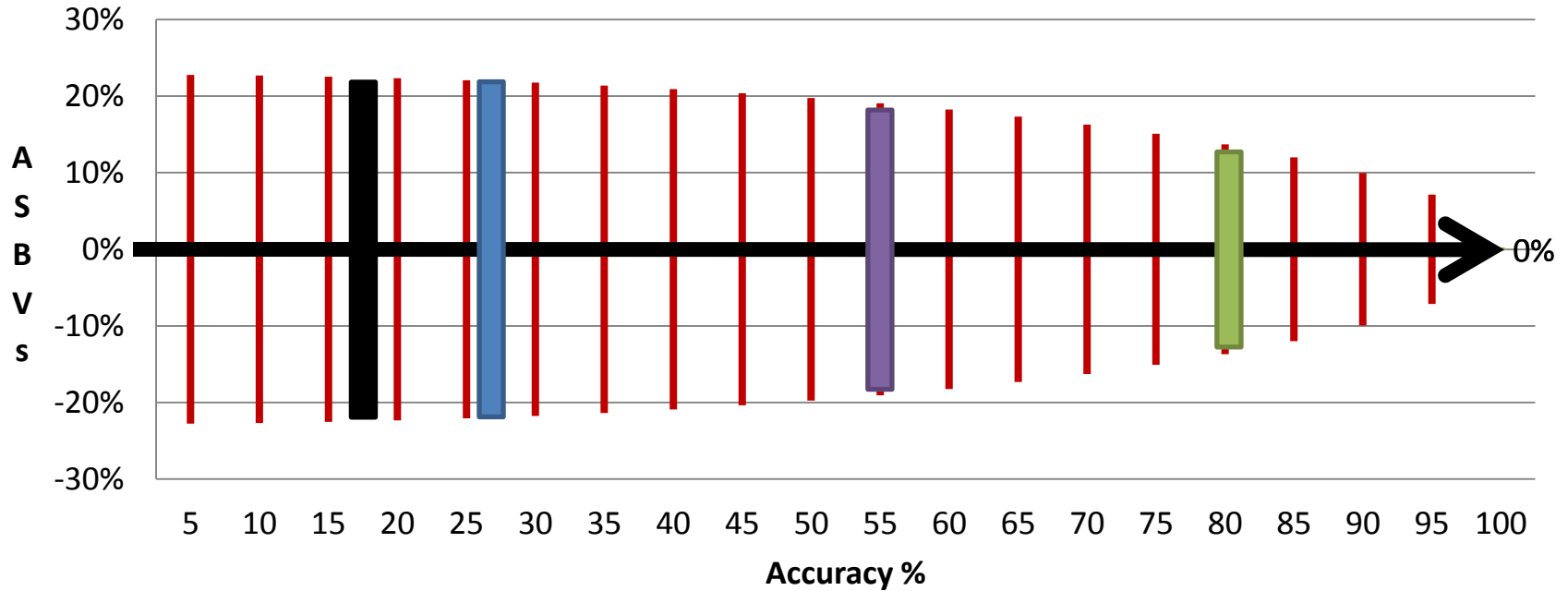
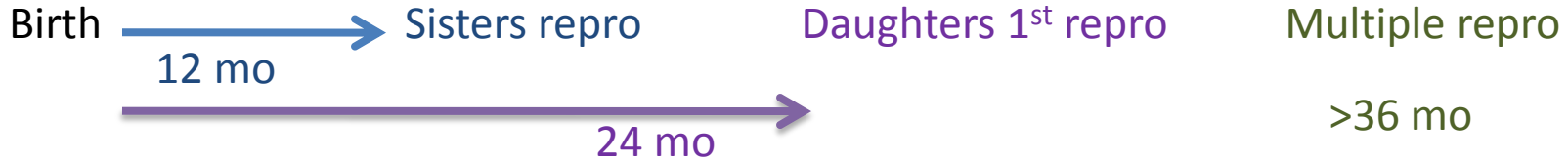
What impact do these properties have for ASBVs?

Low heritability = information from relatives has more impact



Where the measured animal has 15 half-sisters and 15 half-brothers

Potential range in ASBVs



No repro
PWT & PSC
Accuracy ~18%

+Dam repro
+25 HS YNLW
Accuracy ~ 27%

+25 Daughters YNLW
+25 Daughters NLW
Accuracy ~ 55%

+historical + future
multiple records/ewe
Accuracy ~70-90% sires
Accuracy ~40+% ewes

Key points about repro

- Reproduction is sex limited, late in life, lowly heritable
 - ASBVs are still the best option for selection
 - But improvements can be made
 - Direct reproduction data needed for higher accuracy
 - Correlated traits are still a useful addition
- Can't change the nature of the beast
 - But we can have strategies to deal with it

Is the new repro analysis better?

Major Focus of AGBU R&D

- 0.5 person for last 3 years
 - Data estimations
 - Heterosis adjustments
 - New OVIS analyses
 - Mating modules
- Compiling data for more R&D
- Project proposal for more breeder assistance
- Jo Newton (PhD student)

New v Old Repro Analyses

Old

- **Data**
 - All animals in pedigree
 - All weights and SC
 - Repro from drops passing filters
- **Traits**
 - 2 traits (NLB and NLW)
 - 6 observations each (1 to 6 yrs)
- **Groups**
 - Flock + Drop + Season + Age + CM + MG
- **Heterosis adjustments**

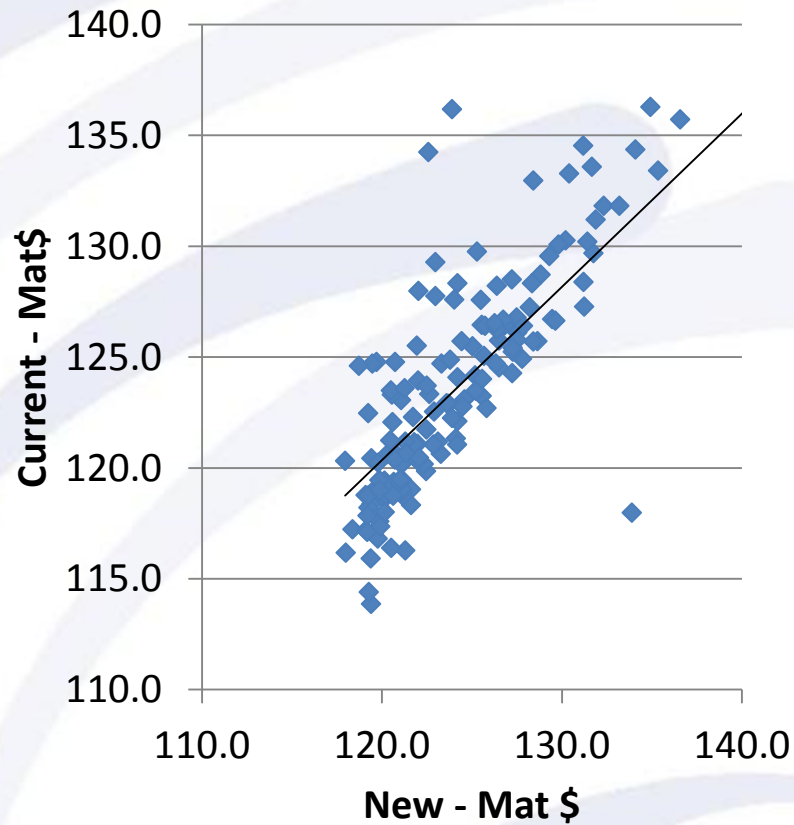
New

- **Data**
 - All animals in pedigree
 - Weights and SC and Repro from drops passing filters
- **Traits**
 - 4 traits (YNLB, YNLW, NLB and NLW)
 - Yearling NLB/W (6-18 months)
 - NLB/W (2 to 7 years)
- **Groups**
 - Flock + Drop + ~~Season~~ + Age + CM + ~~MG~~ + Lamberd_at_1yr_old
- **Heterosis adjustments**

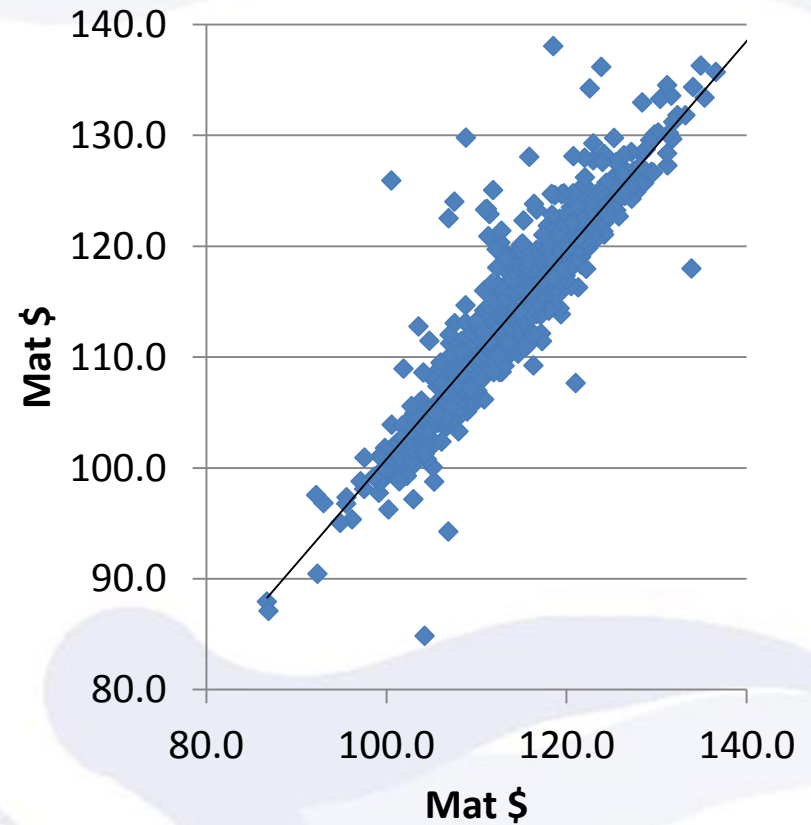
Current vs new analysis - Mat\$ index

Sires used in O2 analysis in past 3 years

Top 150 sires

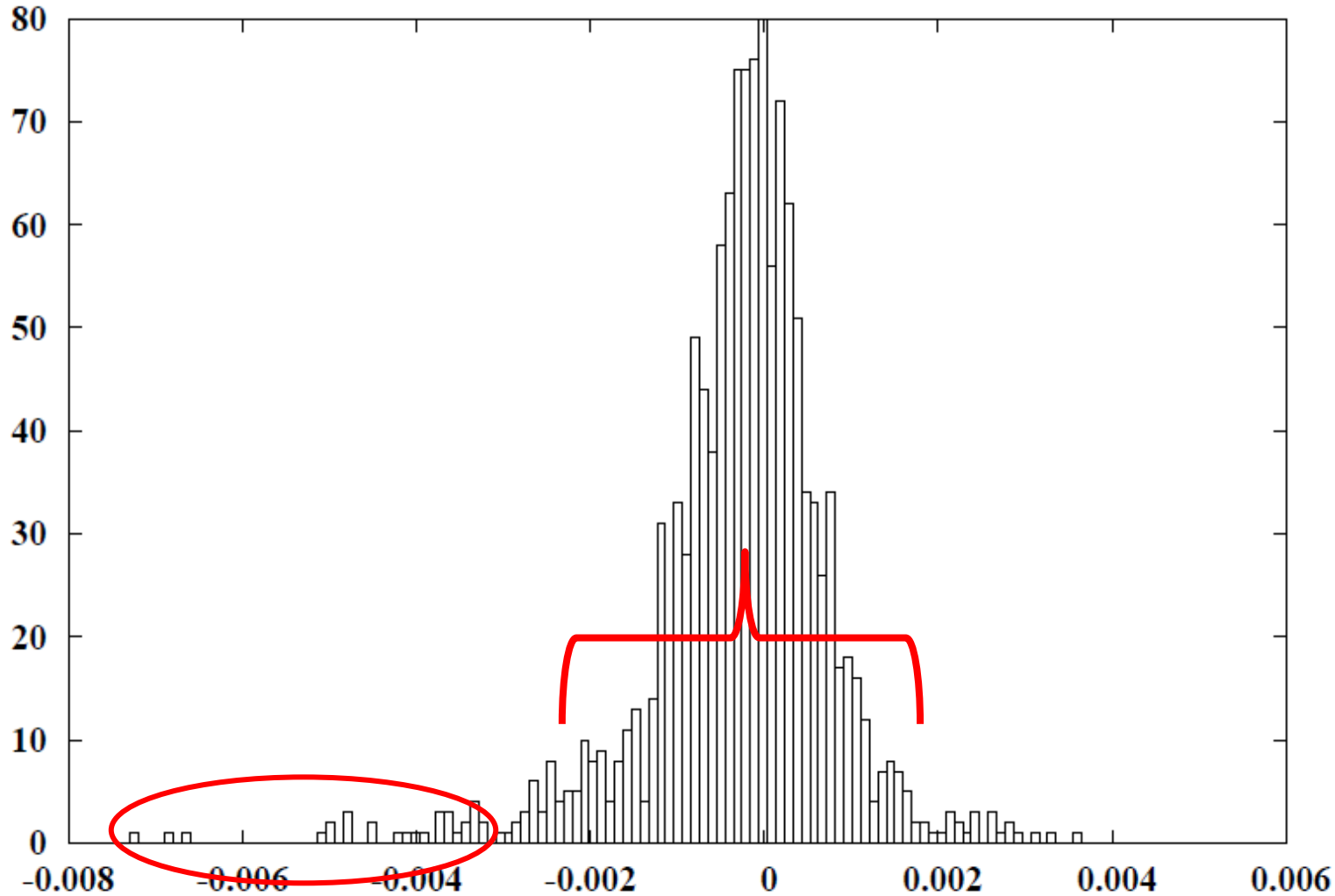


All sires



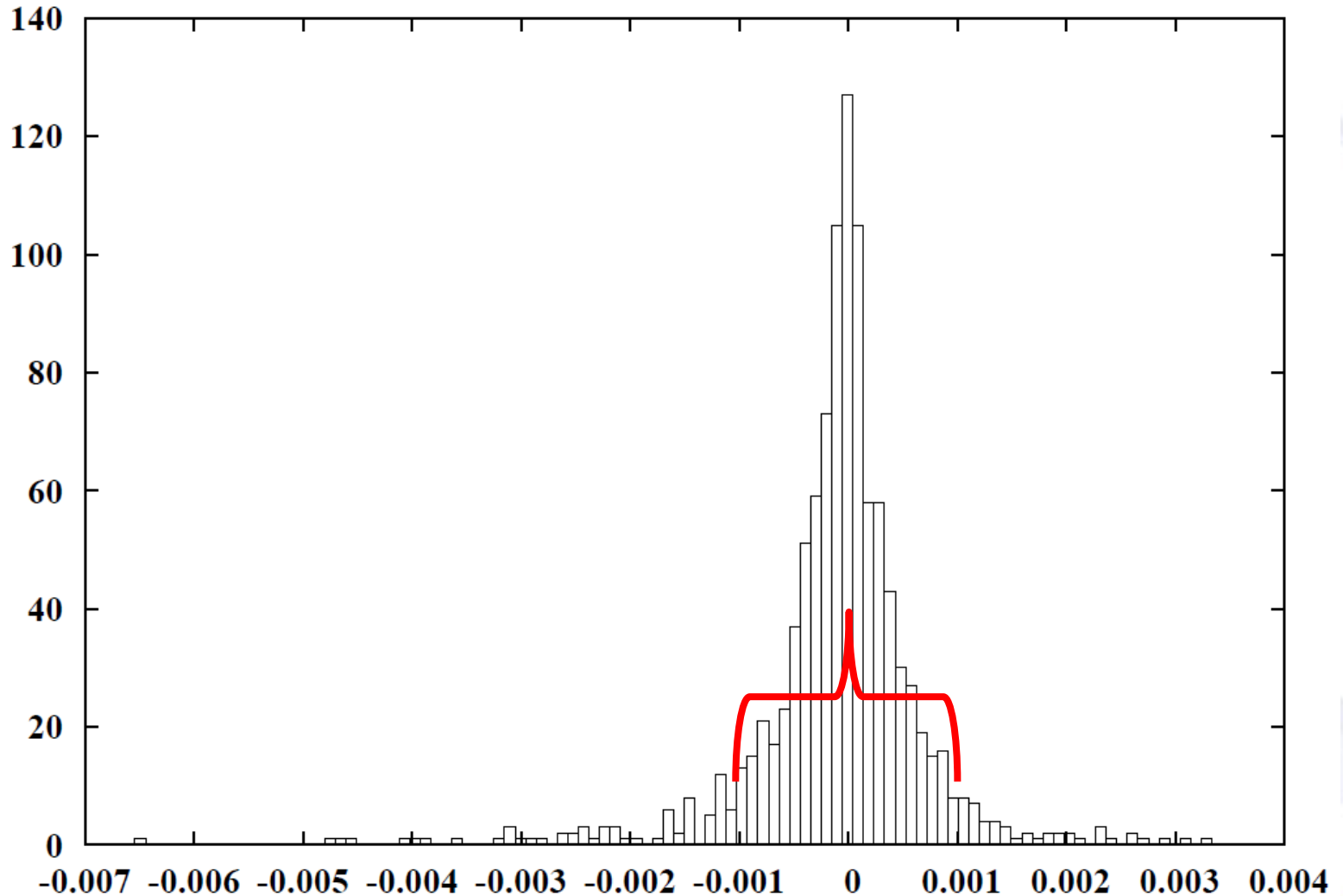
Trends in ASBVs over time (Border sires)

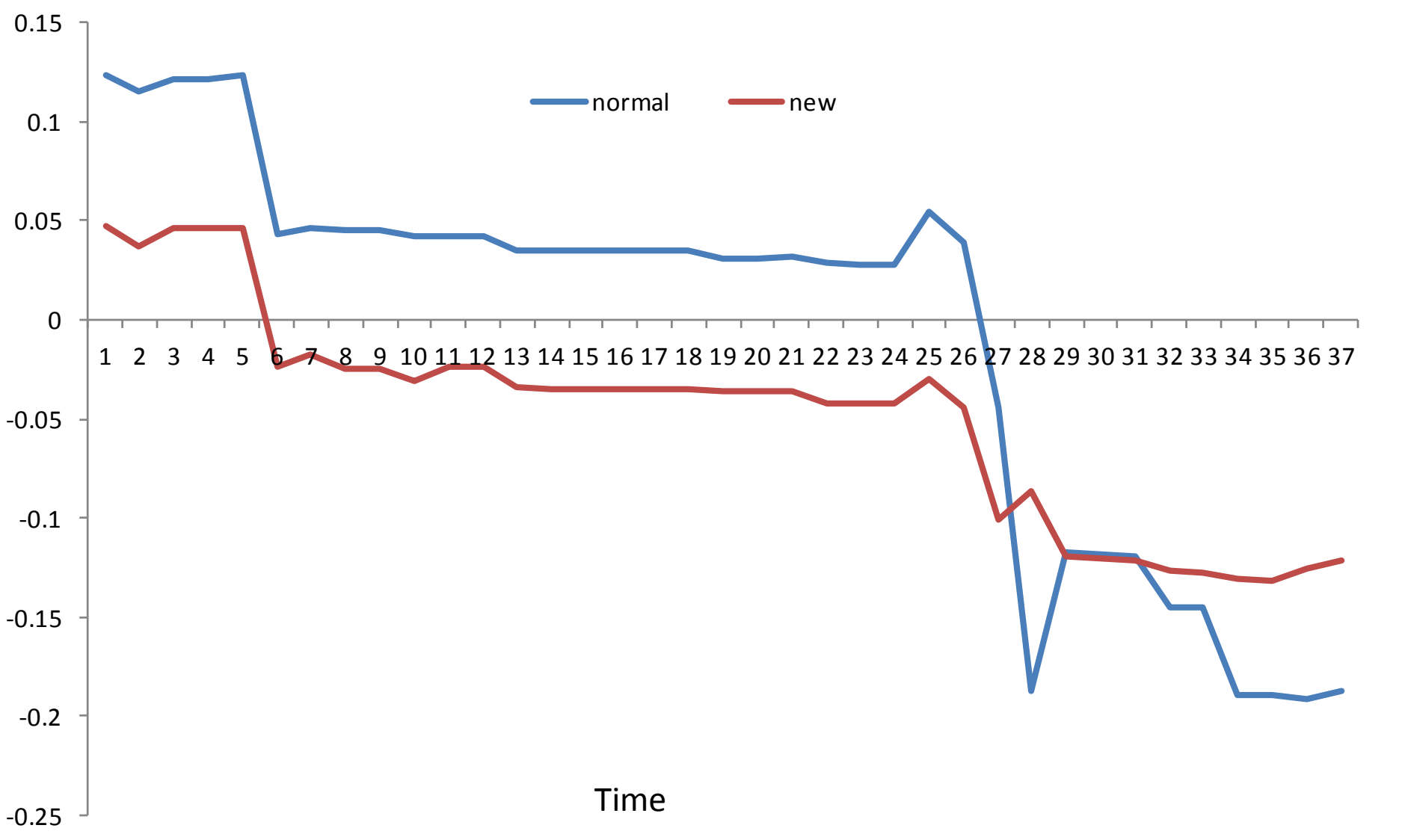
N=1307 Mean=-0.000275 Var=0.000001 Min=-0.007284 Max=0.005403



Trends in ASBVs over time (Border sires)

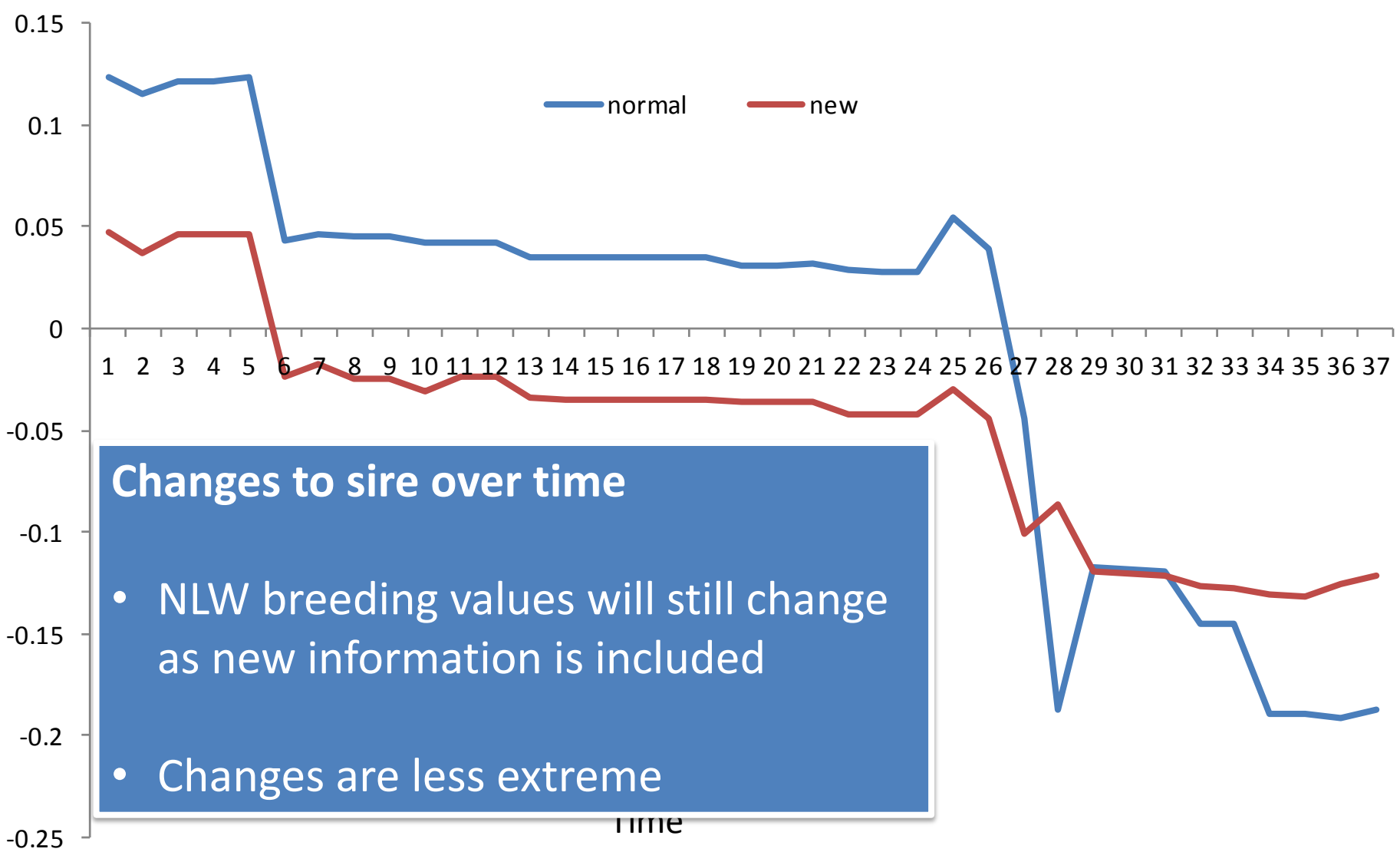
N=1039 Mean=-0.000082 Var=0.000001 Min=-0.006540 Max=0.003431





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Changes to sire over time

- NLW breeding values will still change as new information is included
- Changes are less extreme

Alternative Maternal indexes

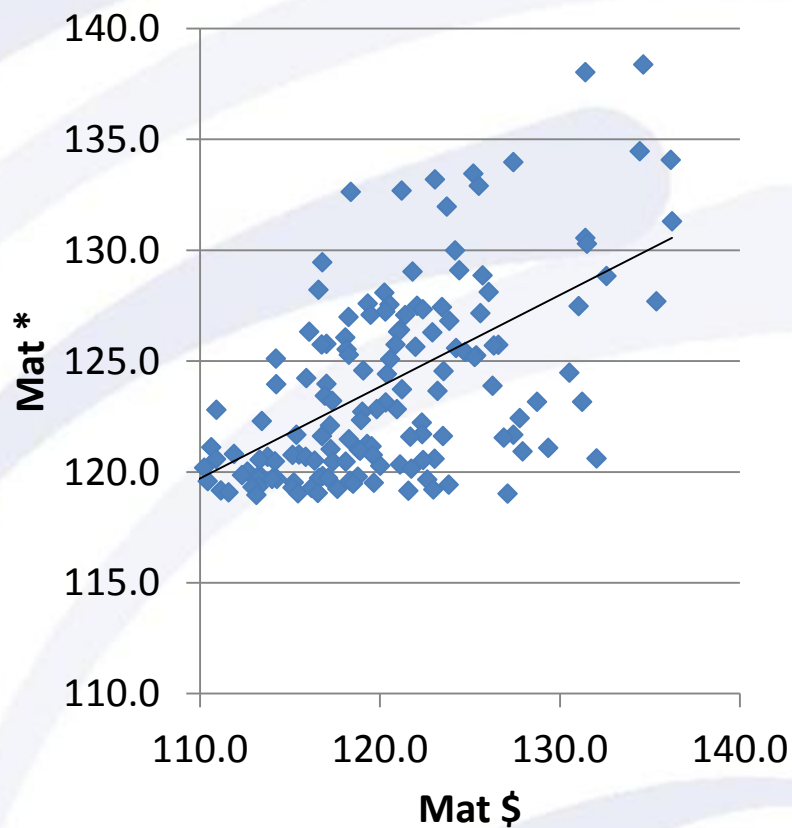
Maternal indexes

- NLW is a key trait in all maternal indexes
 - But only 50% of maternal breeders recording NLW
 - Was addressed through correlations with WT, SC
- Not reporting NLW means index values for animals cannot be compared effectively
 - Comparing ‘apples’ with ‘oranges’
- 3 new non-NLW indexes to balance the current indexes (Mat\$; DP\$; SRC\$)

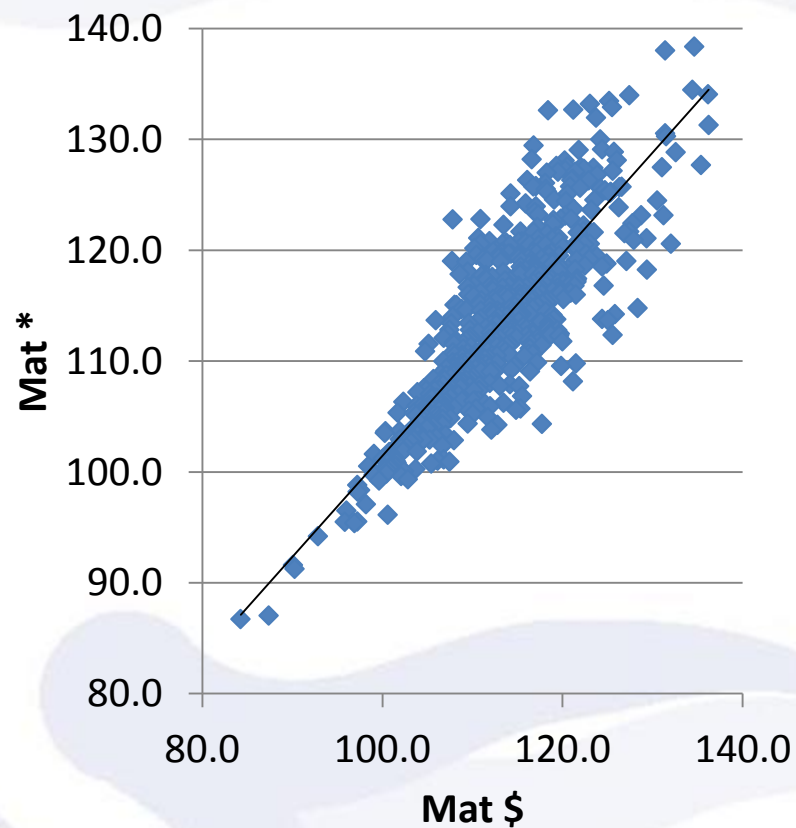
MATc vs MAT\$ – current analysis

Sires used in O2 analysis in past 3 years

Top 150 sires



All sires



Getting repro data - what software is available?

Software alternatives

- Pedigree Wizard
 - No new development for current version
 - “Pedigree Master” nearly ready
 - Mating module to be included
- What else?

Commercial software

- Developed to do more than Pedigree Wizard
 - All comm. software now has standard export format to send to SG
 - Includes mating module export
- Practical Systems – Stockbook
- Sapien – Kool Perform
- More flexibility = more validation required

Mating file template

- Excel file format
- Can be pre-populated with:
 - Current dams
 - Maiden ewes
- Records key traits
 - Mating records
 - *Preg scan records*
 - *Wet / dry records*

Summary

- New mating module for better information
 - You would record the key traits for normal stud management
- Recording information
 - Pedigree Master - soon
 - Commercial software - now
 - Excel template - now

Collecting reproduction data to produce more accurate ASBVs



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Collecting repro information

- Currently
 - record dry ewes and lambs dead at birth
 - Can only get repro records if recording dam pedigree
- Best practice will be...
 - Use mating module for mating groups
 - Record outcome:
 - Against dam in mating module
 - Against lamb if recording dam pedigree

Fictional lambs for ewes without lambs

- Dry ewes
 - Enter a dummy lamb ID against the ewe
 - 501234 2007 **DRY001**, 002, 003, etc
- Dead lambs
 - Enter a dummy lamb ID against the ewe
 - 501234 2007 **DAB001**, 002, etc

Better repro information

- Needed

- Mating records (*Dam*) (for fertility)
- Lambing records (*Lamb*) (for outcome)
- Weaning records (*Lamb*) (for survival)

- Optional

- Preg scan records (*Dam*)
- Wet / dry records (*Dam*)
- Joining weight + condition score

Mating records

- Ewe identity
 - *First joined to lamb before 18 months (Y/N)*
- Joining / Management Group
 - *Pharmaceutical intervention (Y/N)*
 - *Outcome*
- Conception method (Natural, AI, ET, JIVET etc)
- Ram in date (or conception date if AI / ET)
- Ram out date
- Ram identity

- Repeat for backup ram if used

ie. The records you use in normal stud management

Summary of LAMBPLAN changes

- Changes to improve stability of NLW
 - Across breed maternal analysis
 - Updated reproduction model
 - No NLW unless DRY ewes identified
 - Maternal indexes without NLW
 - Mating module for better reproduction data
- New carcase traits for earlier selection
 - Weaning scan breeding values
- When are the changes?
 - June 15 Maternal LAMBPLAN analysis