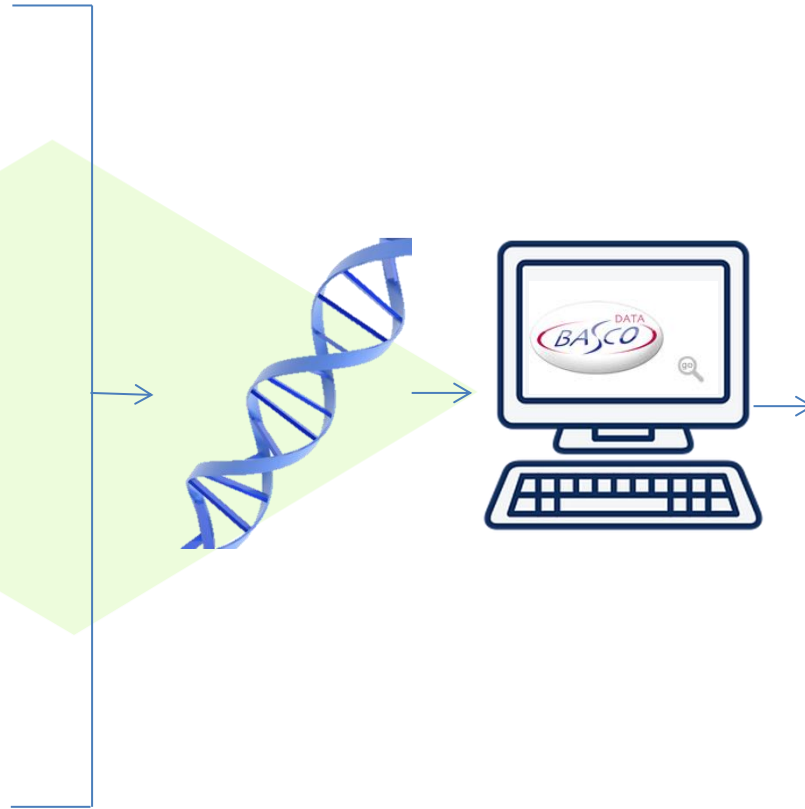
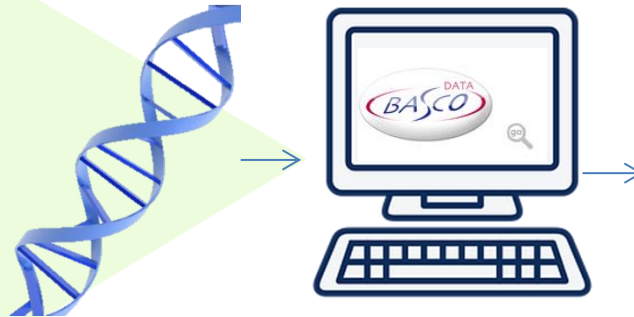


Identifying superior carcasses through VIA and genomics

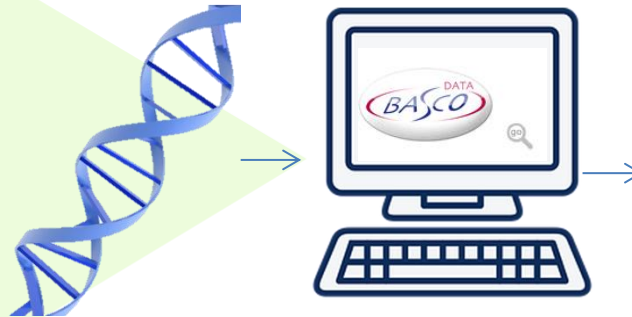


- In partnership with AHDB Dairy, Signet/AHDB beef and lamb & private companies to deliver EBVs & selection indices





- In partnership with AHDB Dairy, Signet/AHDB beef and lamb & private companies to deliver EBVs & selection indices



- R & D & consultancy delivery
SRUC

Genetic improvement



- Cumulative
- Effective
- Sustainable
- Cost effective

1. VIA Carcass trait GEBVs

- 4 year project (2012-2015)
- Limousin genomic breeding values for abattoir VIA carcass traits
- First UK genomic breeding values March 2016

Projects



1. VIA Carcass trait GEBVs

- 4 year project (2012-2015)
- Limousin genomic breeding values for abattoir VIA carcass traits
- First UK genomic breeding values March 2016

2. Beef profitability

- Side project of VIA carcass traits
- Investigating the effect of slaughter age on profit

Projects



1. VIA Carcass trait GEBVs
 - 4 year project (2012-2015)
 - Limousin genomic breeding values for abattoir VIA carcass traits
 - First UK genomic breeding values March 2016
2. Beef profitability
 - Side project of VIA carcass traits
 - Investigating the effect of slaughter age on profit
3. Fertility and calf survival GEBVs
 - 1 year project (began April 2016)
 - Genomic breeding values for female fertility traits and calf survival
 - GEBVs available in 2017

VIA carcass traits project

Carcass Data



- VIA carcass data
 - 83,342 records
 - From July 2012
 - Net weight, conformation, fat and 6 primal cuts:
 - Topside
 - Silverside
 - Striploin
 - Fillet
 - Knuckle
 - Rump

British Cattle Movement Service



- COMMERCIAL animals

- Information

- Dam
- Breed
- Date of birth
- Date of death
- Movement
- Sire (not compulsory)

Benefits of industry data



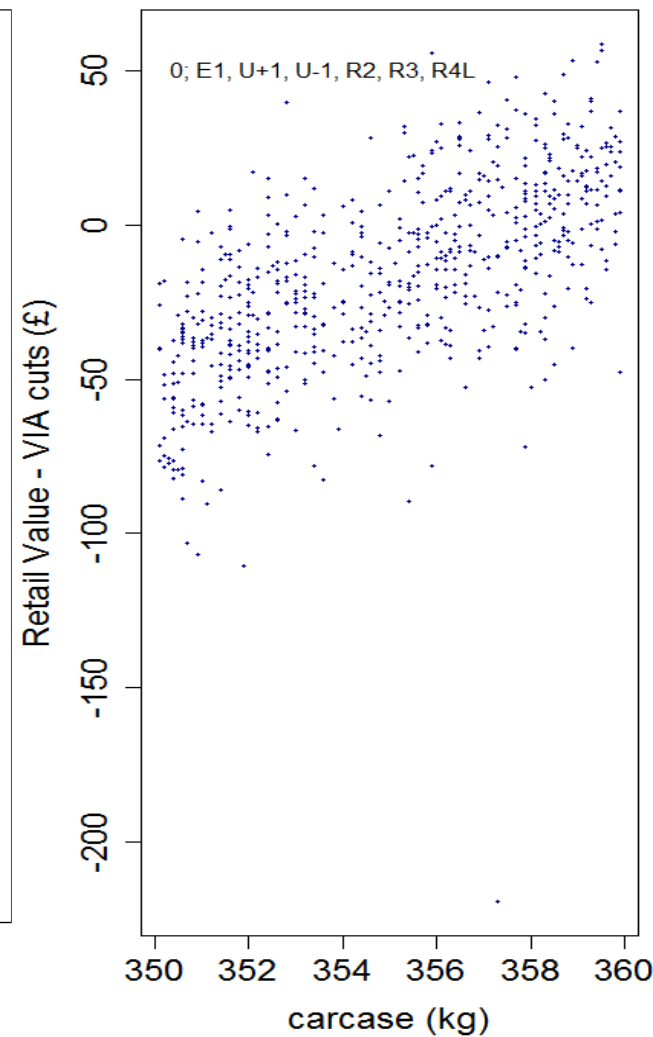
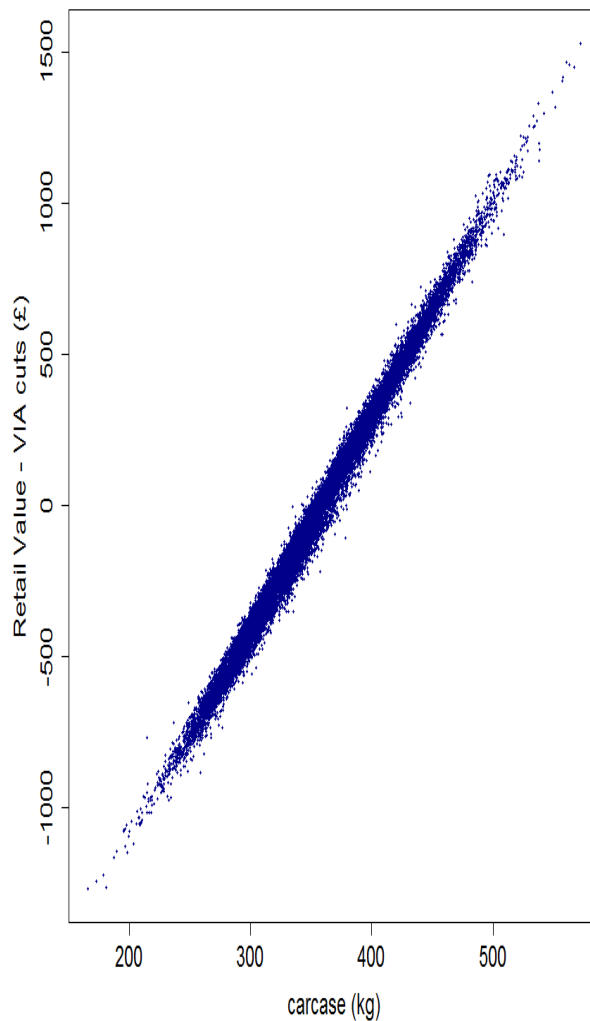
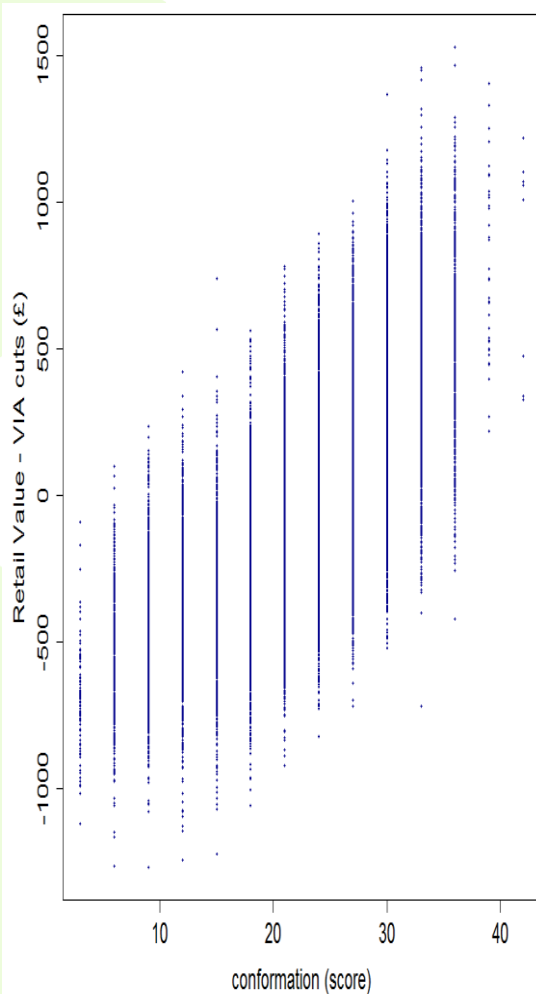
- Massive benefit to the industry
 - Large number of records
 - Traits of importance £
 - Stronger links in the supply chain
- 'Super-pedigree'
 - Most complete pedigree in the UK including all bovine
 - BCMS
 - Pedigree (beef and dairy)
 - Milk recording records

What does the raw VIA data tell us

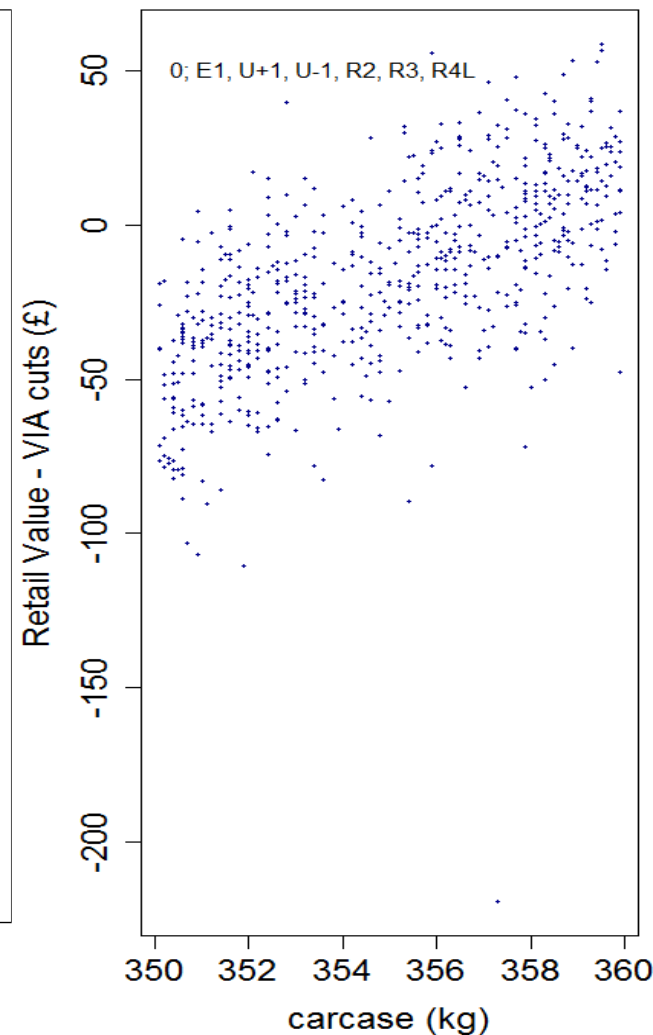
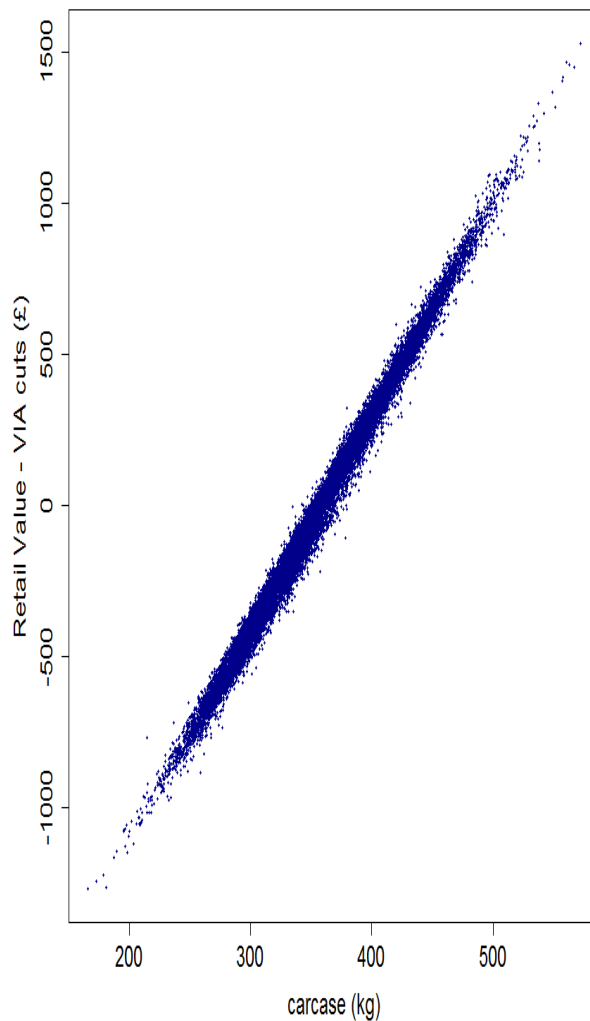
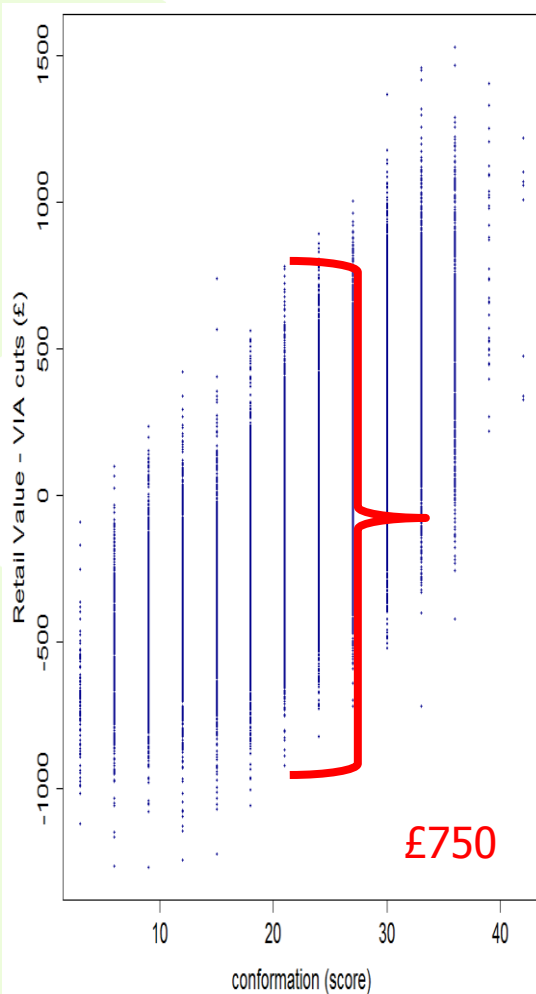


- VIA technology allows us to better assess carcass yields for the valuable primal cuts
 - Large variation for the all VIA traits – even when considering similar EUROP grades and weight
- Selecting for a favourable primal cut yield for 1 VIA trait is not at the expense of other VIA traits

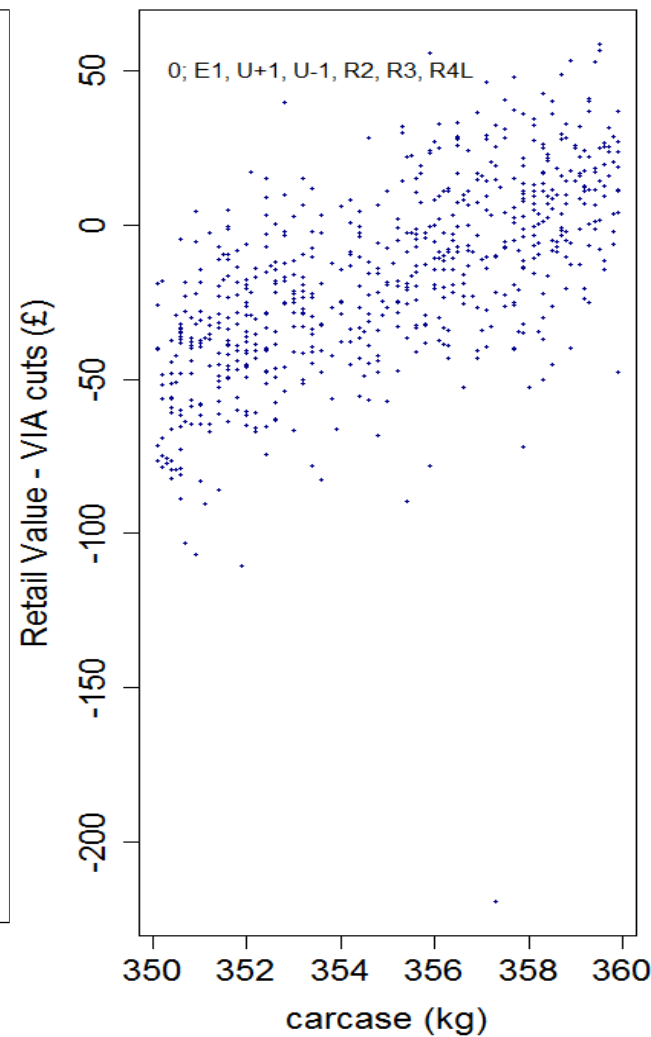
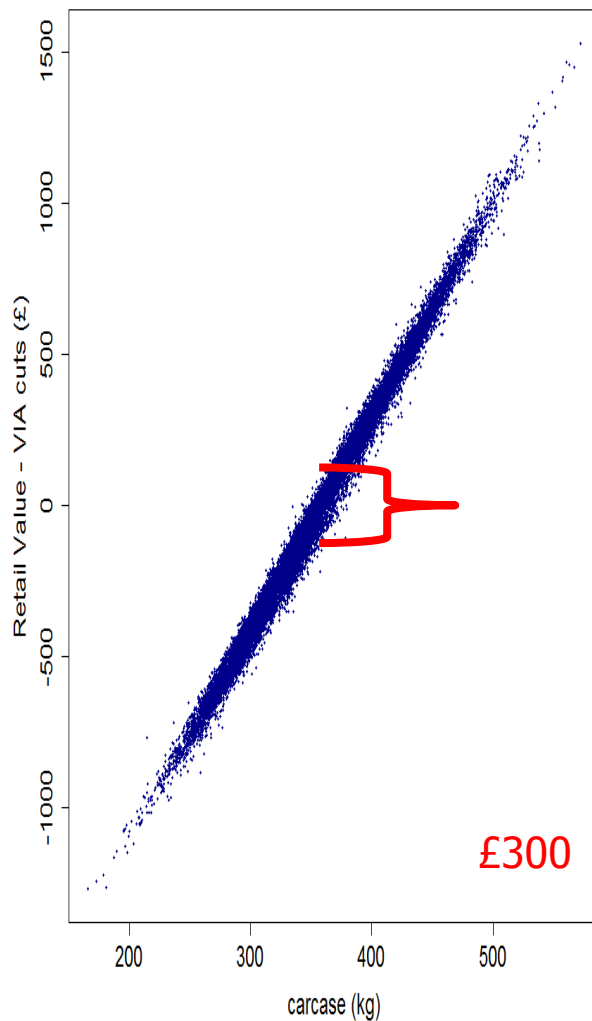
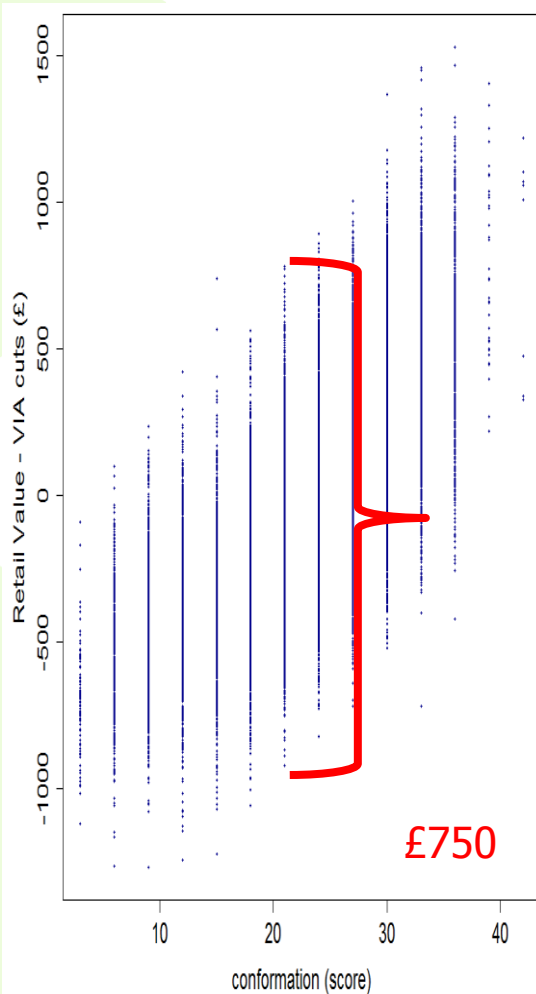
Opportunities to better differentiate carcasses



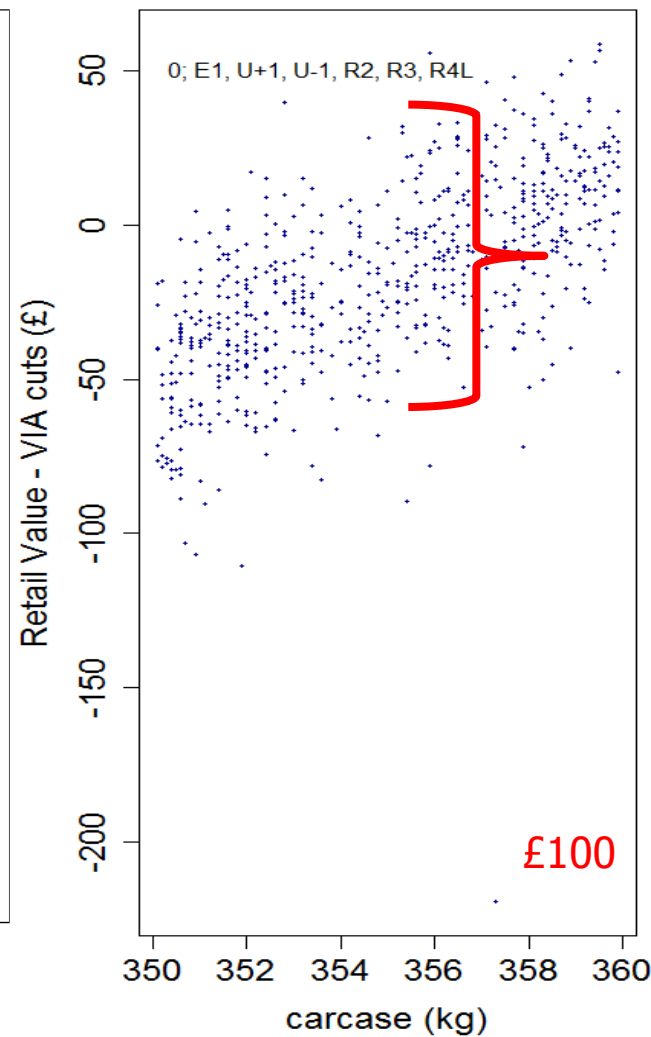
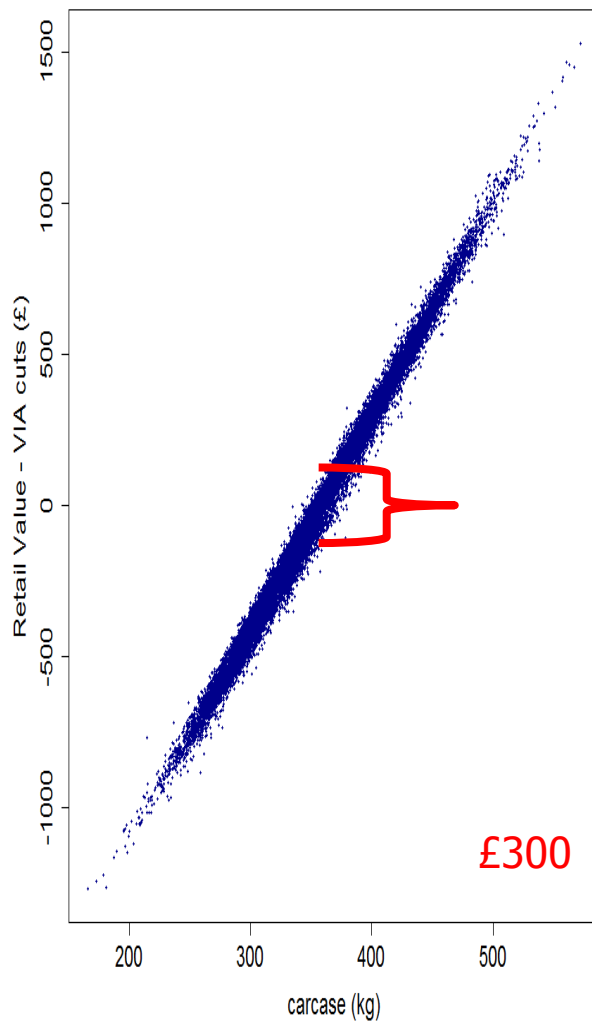
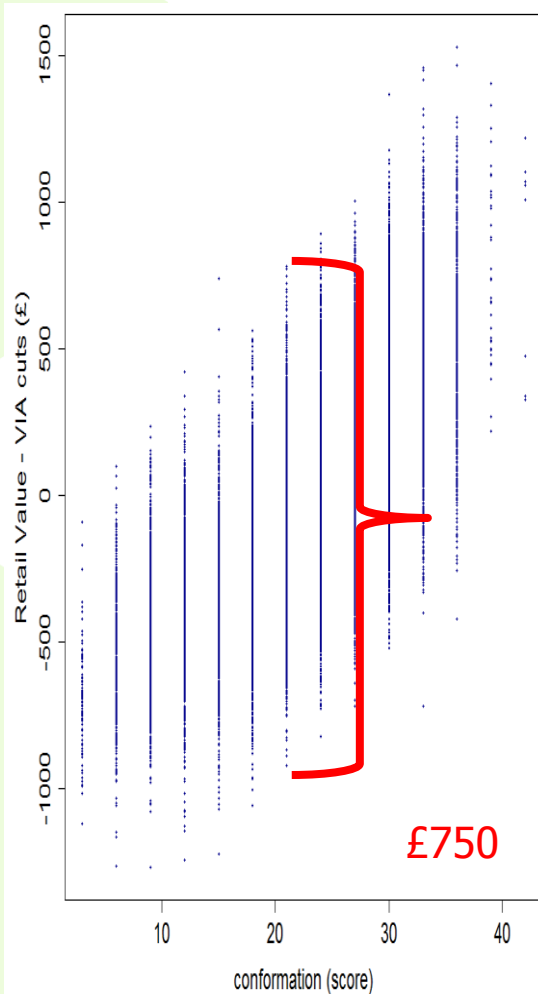
Opportunities to better differentiate carcasses



Opportunities to better differentiate carcasses



Opportunities to better differentiate carcasses



We can use EBVs to breed for abattoir carcass traits



- Variation and heritable
 - good rate of genetic progress
- BUT
 - Measured at the end of life
 - Not measured on breeding animals
 - Selection decisions made before actual carcass data on progeny is available
 - EBVs based on parent averages (less accurate EBV compared to when actual phenotypes available)
 - Affects the rate of genetic progress

Genomic breeding values



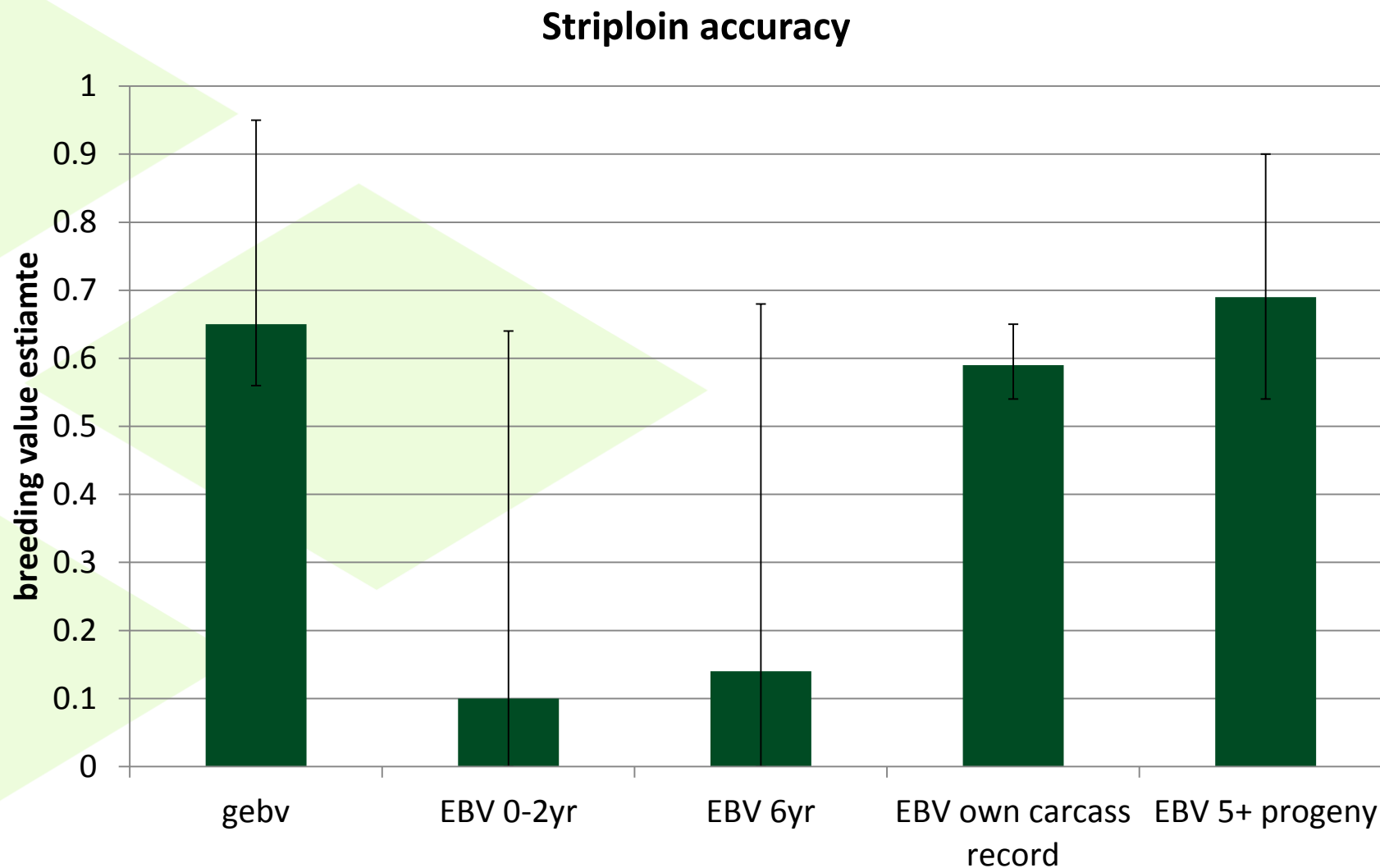
- Carcass traits are ideal for genomic selection
- A GEBV is used in exactly the same way as an EBV
- BUT it is available at BIRTH with good accuracy
- Improving the rate of genetic progress

Limousin reference population

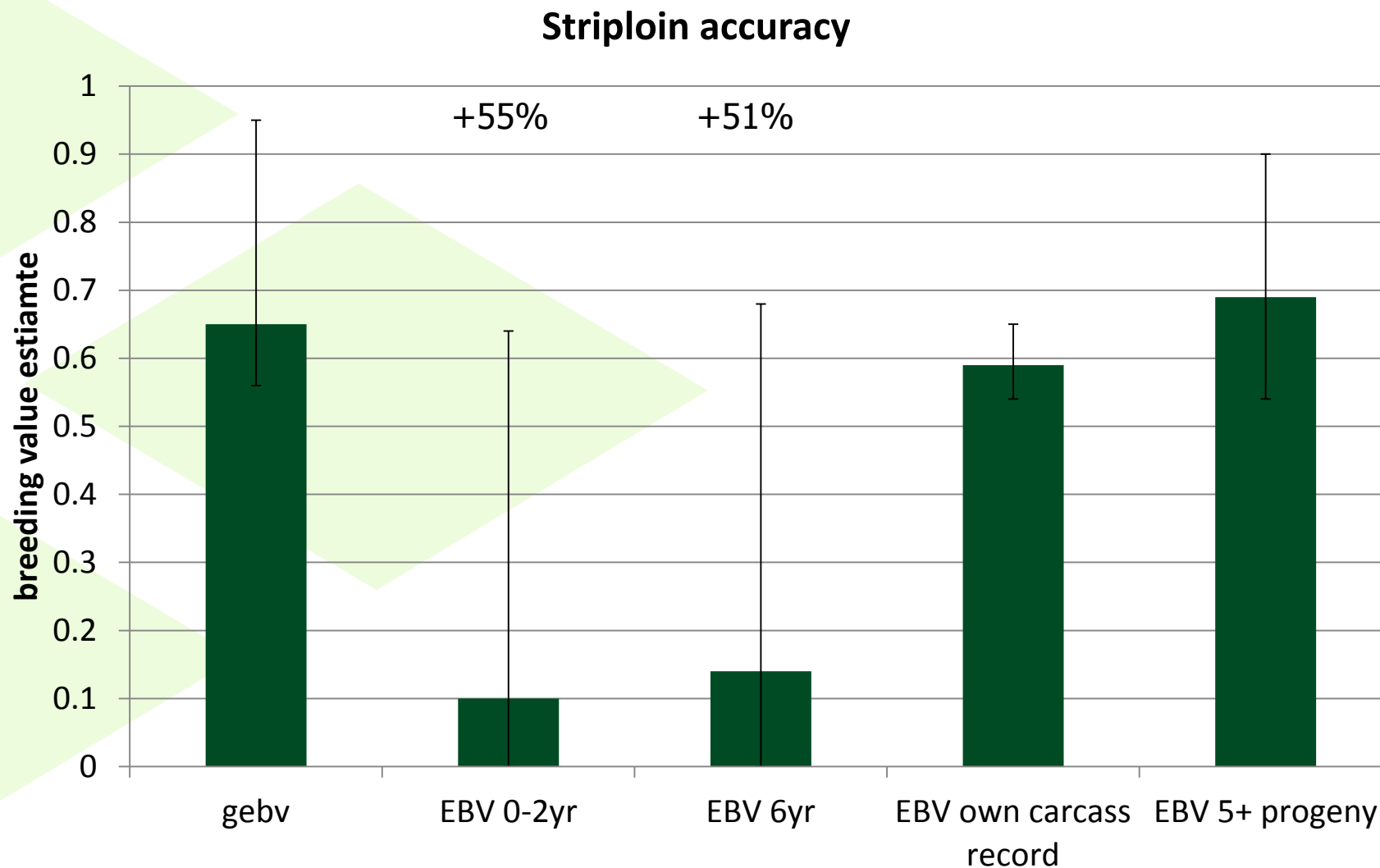


- >4,000 Limousin genotypes
 - 716 HD SRUC
 - 960 HD Ireland
 - 2,490 project 50k
 - 200 LD (IDB-19k)
- Use one-step approach
 - Allows breeding values to be estimated for genotyped and non-genotyped animals

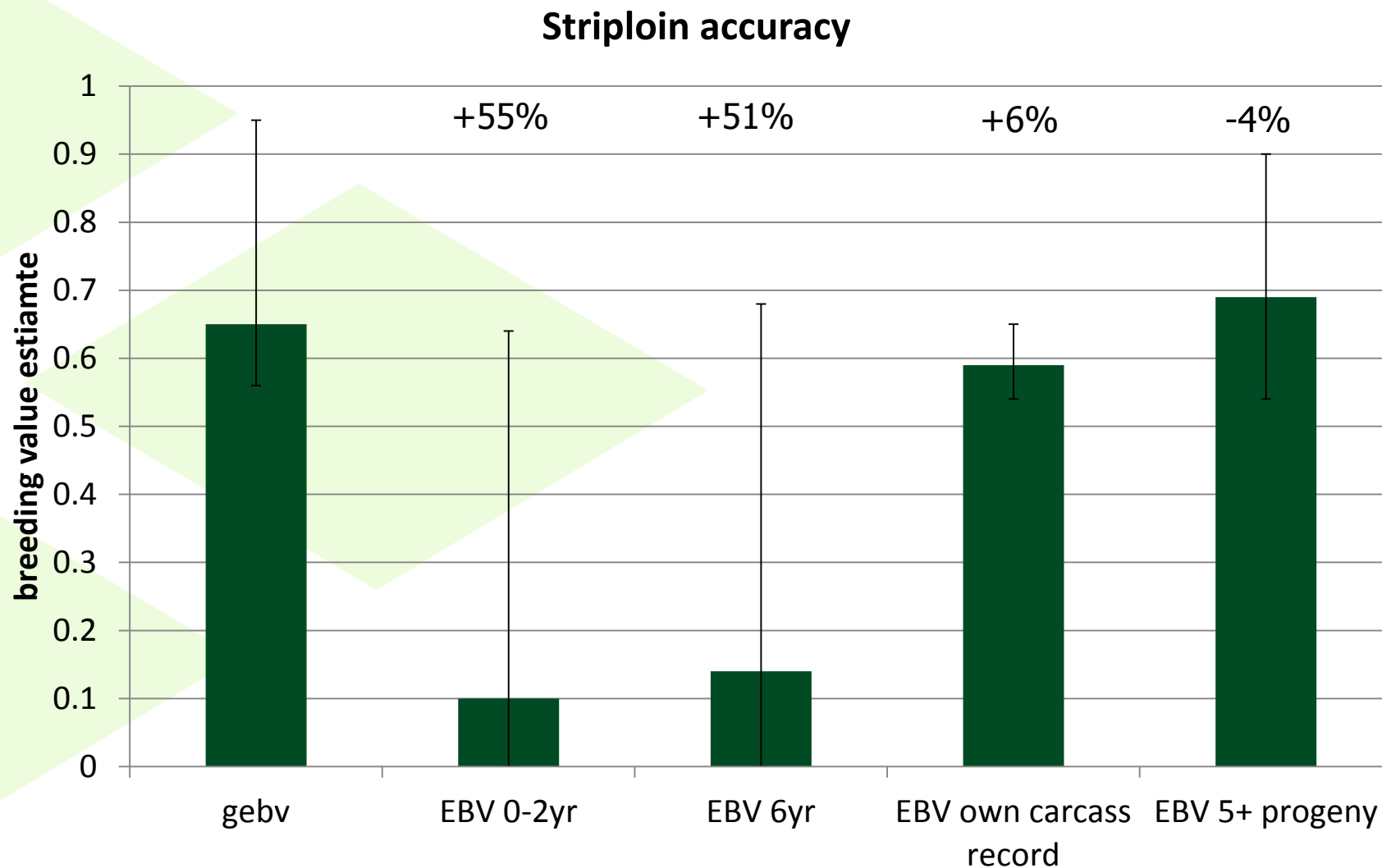
Striploin accuracy



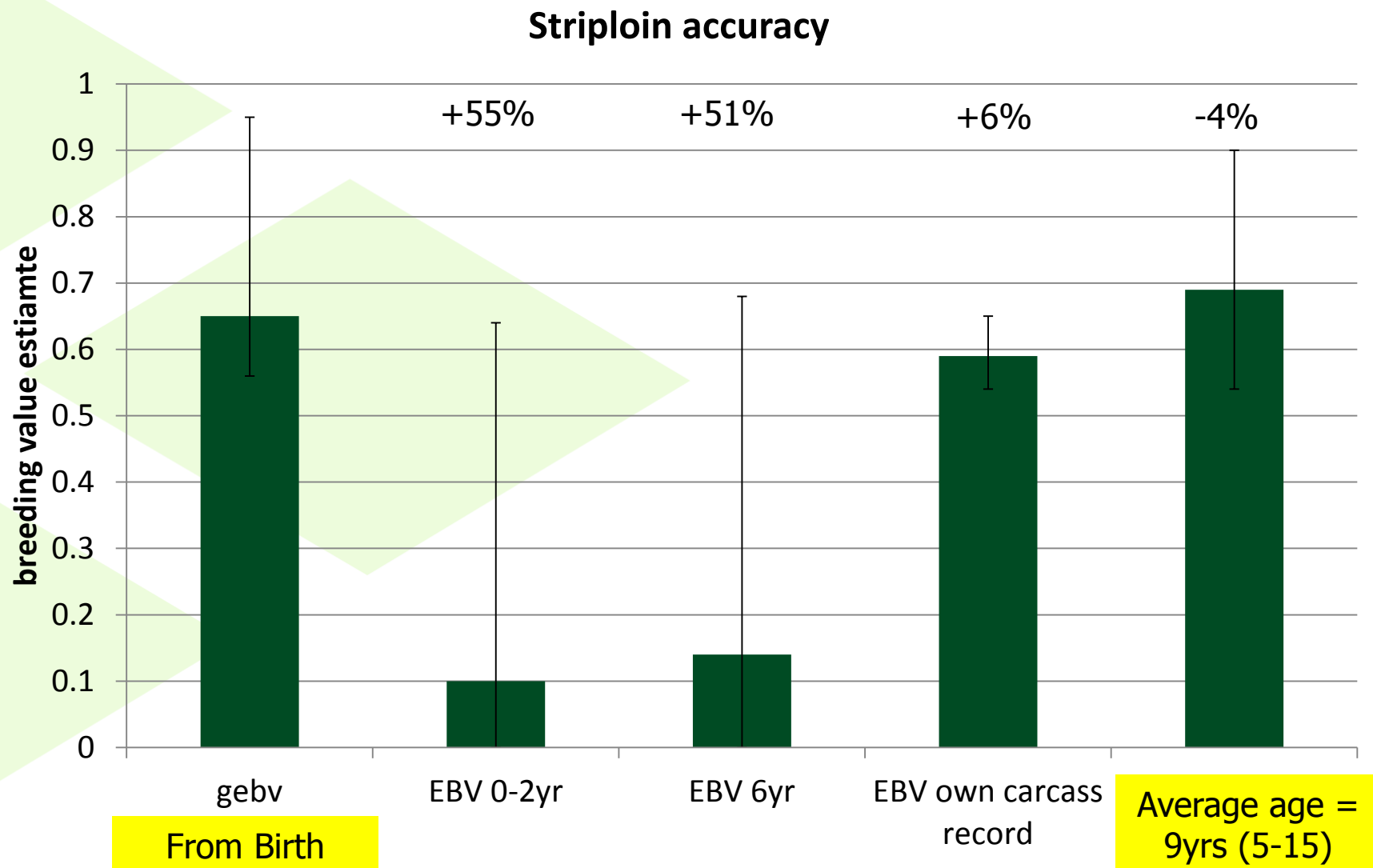
Striploin accuracy



Striploin accuracy



Striploin accuracy



Conclusion



- Commercial data is enabling the production of selection tools on traits for which farmers are paid for
- VIA has facilitated the targeting of high value primal cuts
- Genomics has improved accuracy from an early age-increased genetic gain
- The first GEBVs were made available to Limousin cattle in March 2016

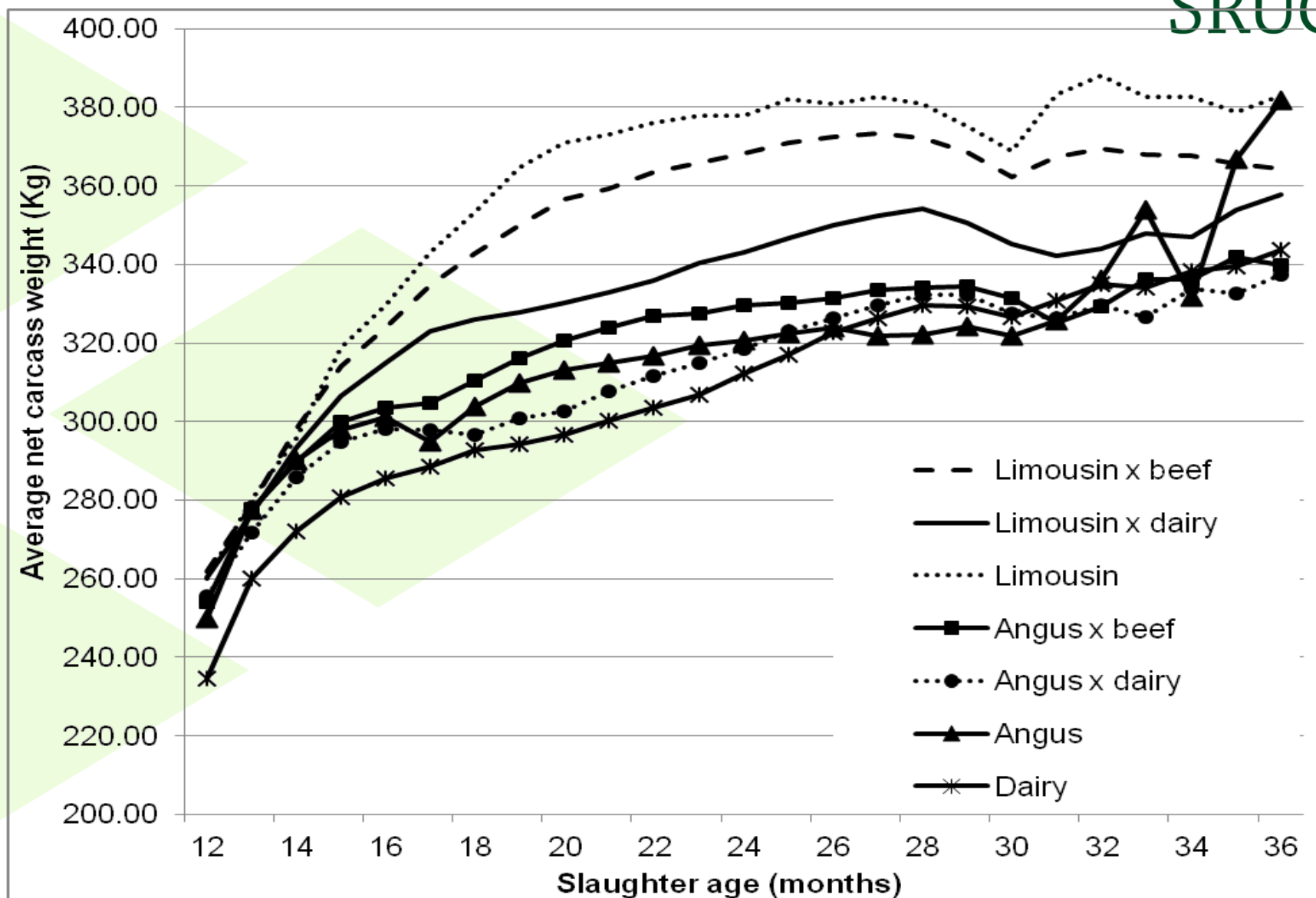
Optimal Slaughter Age of UK Beef Cattle to Increase Profitability

A. Moran¹, K. Moore¹, P. Amer² and M. Coffey¹

¹SRUC, Penicuik, Scotland

²AbacusBio, Dunedin, New Zealand

Beefdairy beef

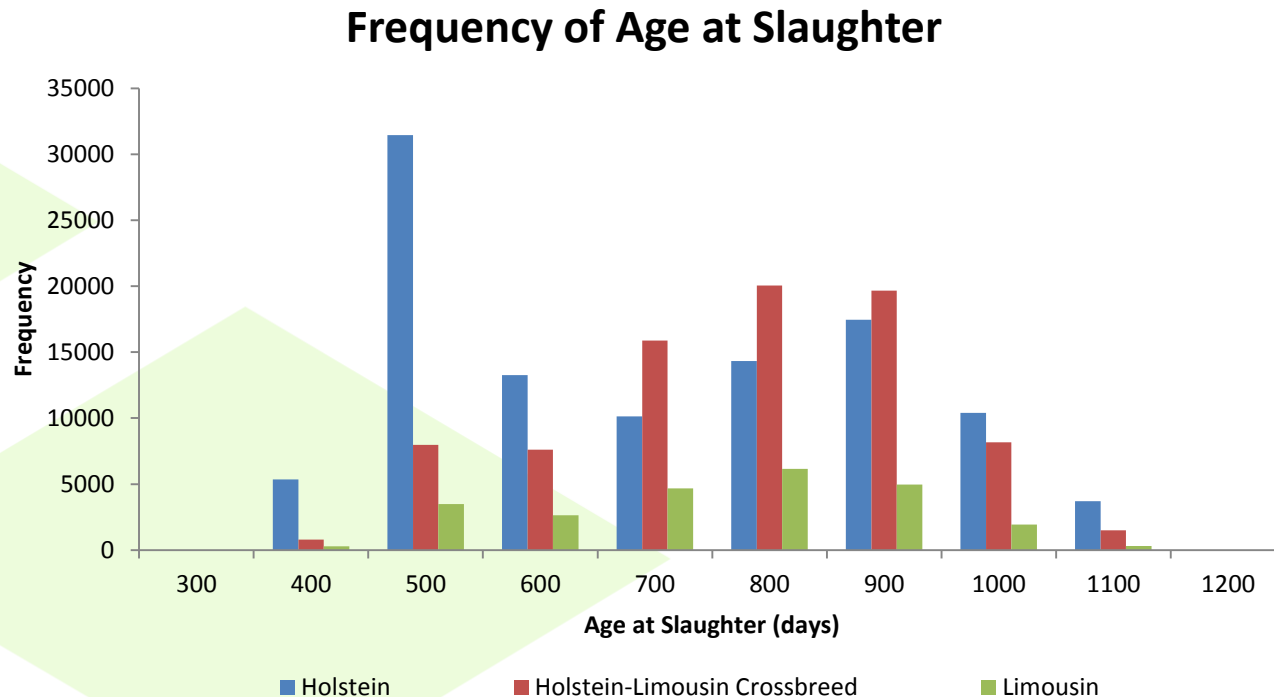


Data

- 1 million records from 7 UK abattoirs between 2001 and 2013:
 - Carcass weight (mean 325kg)
 - Conformation score
 - Fat score
 - Date of birth
 - Date of slaughter (mean 715 days)
 - Breed



Slaughter Age



- Beef and beef-dairy crossbreeds are most frequently finished on 24 month systems
- Holsteins are frequently finished on 18 month systems

Calculating carcass value



- Carcass value calculated from price grids
 - Base price £3.66/kg
 - Penalised if
 - Outside weight range 260-420kg
 - Older than 30 months

	1	2	3	4L	4H	5L	5H
E	5	10	10	5	-15	-50	-50
U+	BASE	5	5	BASE	-15	-50	-50
U-	BASE	5	5	BASE	-15	-50	-50
R	-5	BASE	BASE	BASE	-15	-50	-50
O+	-10	-5	-5	-10	-20	-60	-60
O-	-20	-15	-15	-25	-40	-70	-70
P+	-30	-25	-25	-35	-40	-80	-80
P-	-30	-25	-25	-35	-40	-80	-80

Calculating cost



Concentrates
@£170/tonne



Silage
@£30/tonne



Straw
@£67/tonne



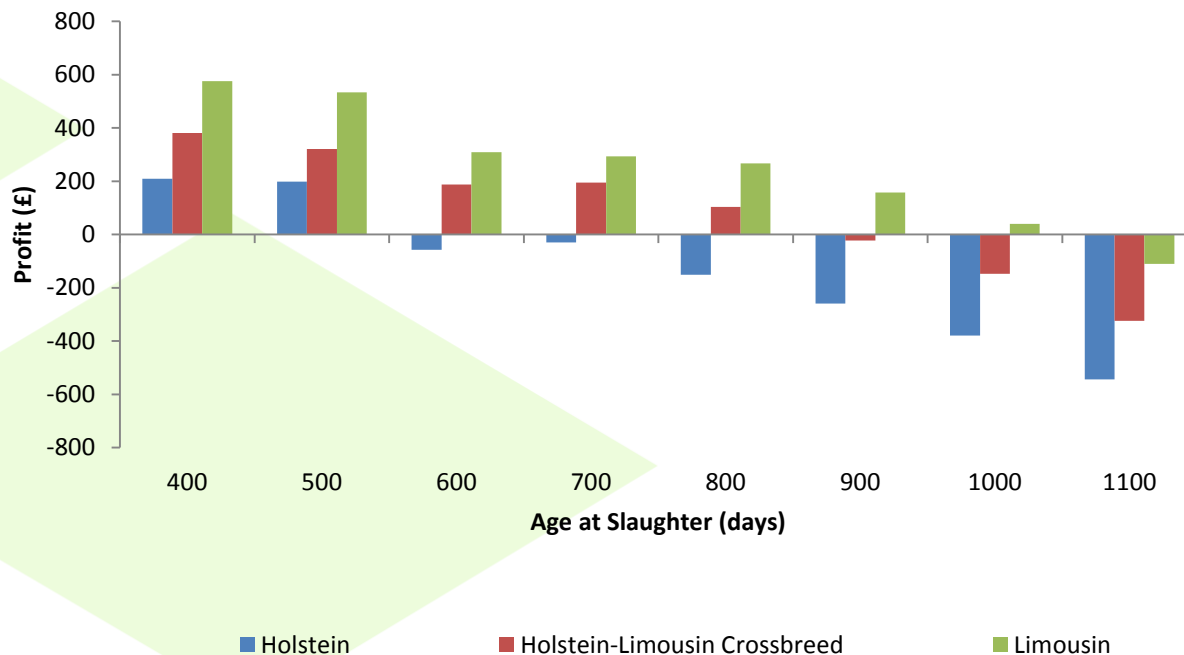
Grass
@£20/tonne



- Other costs (Summer £1.06/day, winter £1.18/day)
 - Season of birth
 - Vet fees
 - Machinery
 - Haulage
 - Labour
 - Overheads
- Emissions calculated from finishing system

Profitability

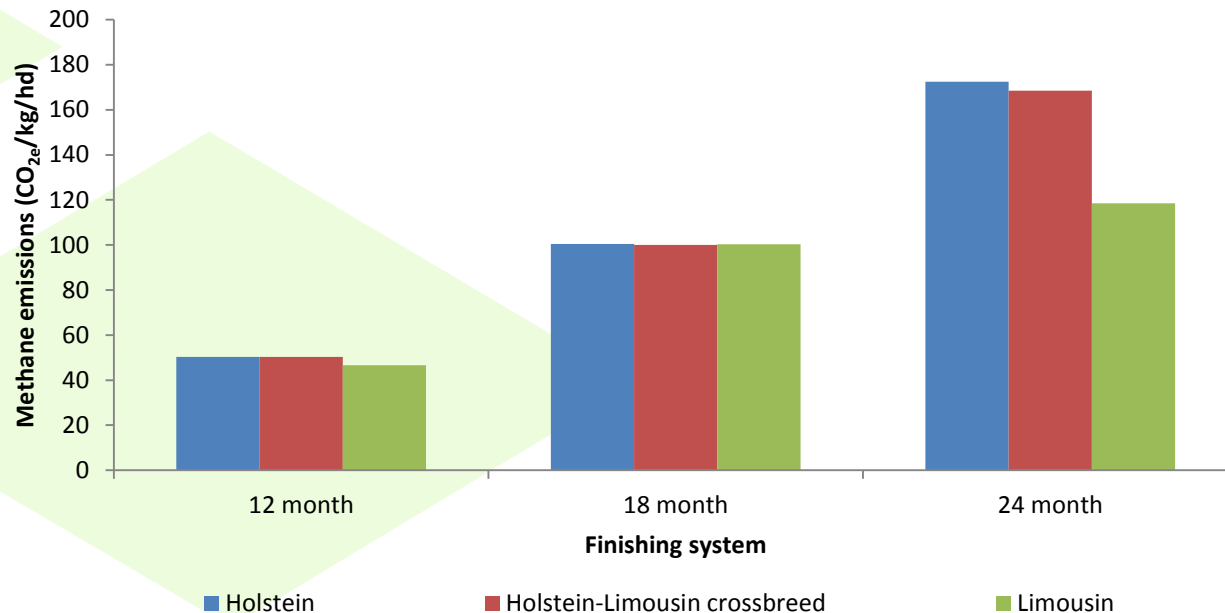
Mean Profit at Age of Slaughter for Breeders



- All breed types most profitable on a 12 month system.
- Profit does not account for purchase price

12 month systems reduce emissions

GHG emissions by finishing system



- 12 month systems reduce emissions by up to 3 times
- Increasingly important factor for the future

Impact (On the farm)



- Profit could be increased by as much as £700/head

- Emissions could be reduced by 33%



- Productivity could be doubled

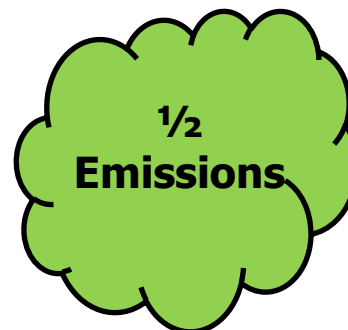
Impact (Wider industry)

- 1.5 million beef animals slaughtered each year



£15 million

- Beef produces twice the enteric emissions of dairy or lamb



- Worth almost 1 billion to economy
 - Self sufficient production

Conclusion



- We have the potential to:
 - Improve profitability
 - Improve productivity
 - Reduce emissions
- Optimal slaughter age is 12 months

Conclusion

- We have the potential to:
 - Improve profitability
 - Improve productivity
 - Reduce emissions
- Optimal slaughter age is 12 months
- Aim to slaughter as soon as possible



Improvement of fertility and calf survival in the UK beef industry

Abbygail Moran, Kirsty Moore

Background

- Fertile suckler cows and low calf mortality are essential for profitable beef production systems
- Little genetic progress in the industry for these traits
- Currently EBVs are produced for
 - Age at first calf
 - Lifespan
 - Calving interval
- Limousin are the most dominant breed and accounts for a third of the UK breeding herd



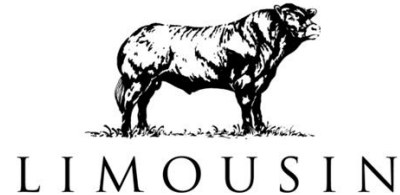
Project Aims



- To provide tools for the accurate selection of fertility and calf survival traits
- Produce GEBVs for
 - Age at first calf
 - Lifespan (number of calves before 6.5 years)
 - Calving interval
 - Calf survival (20 days to 10 months)
- Use national records (BCMS)
- Create a blueprint for other breeds



Acknowledgements



Food Group



- Thanks also to those who provided data