

16 November 2024

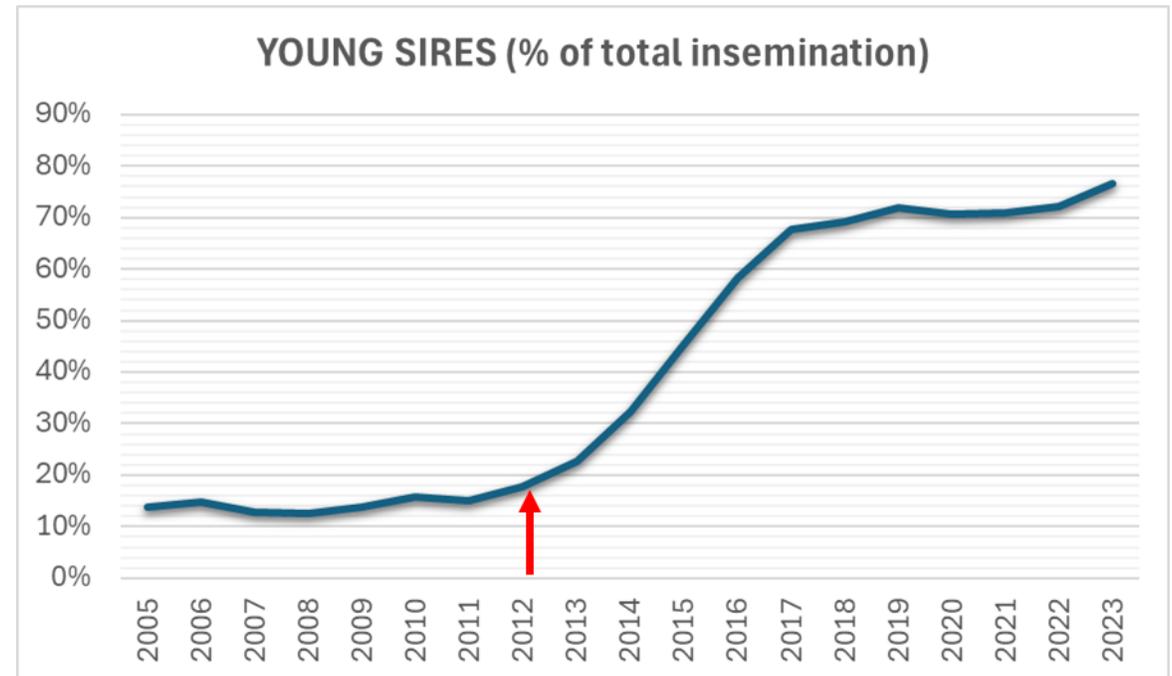
What has Dairy learnt from DNA?

Victoria Ashmore

Animal Genetics Senior Data Analyst

Holstein breeding in a snapshot

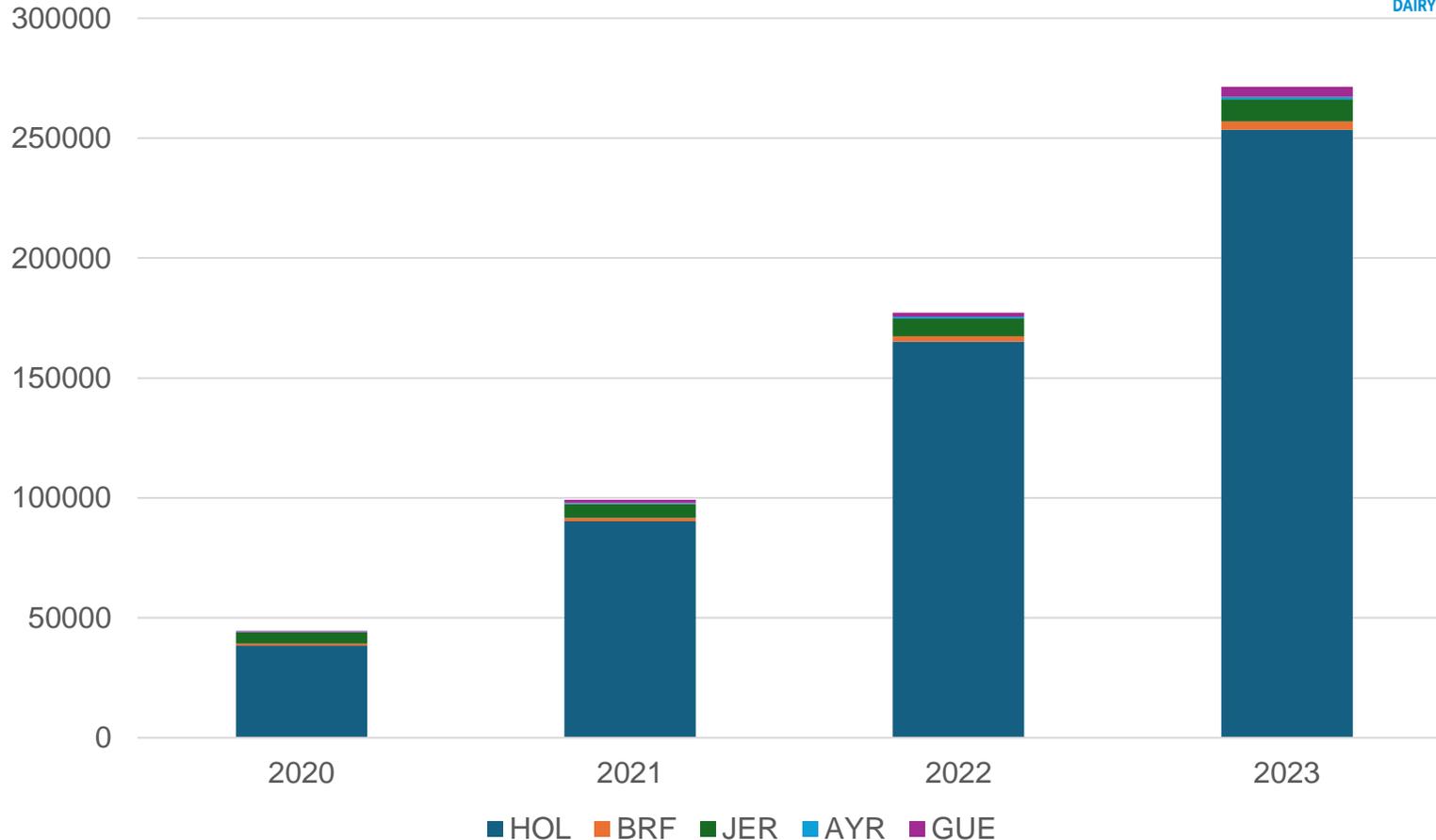
- Genomics introduced in 2012
- Use of genomic young sires
 - ✓ at ~70% of all dairy inseminations
 - doubling genetic progress ! 



Where are we currently



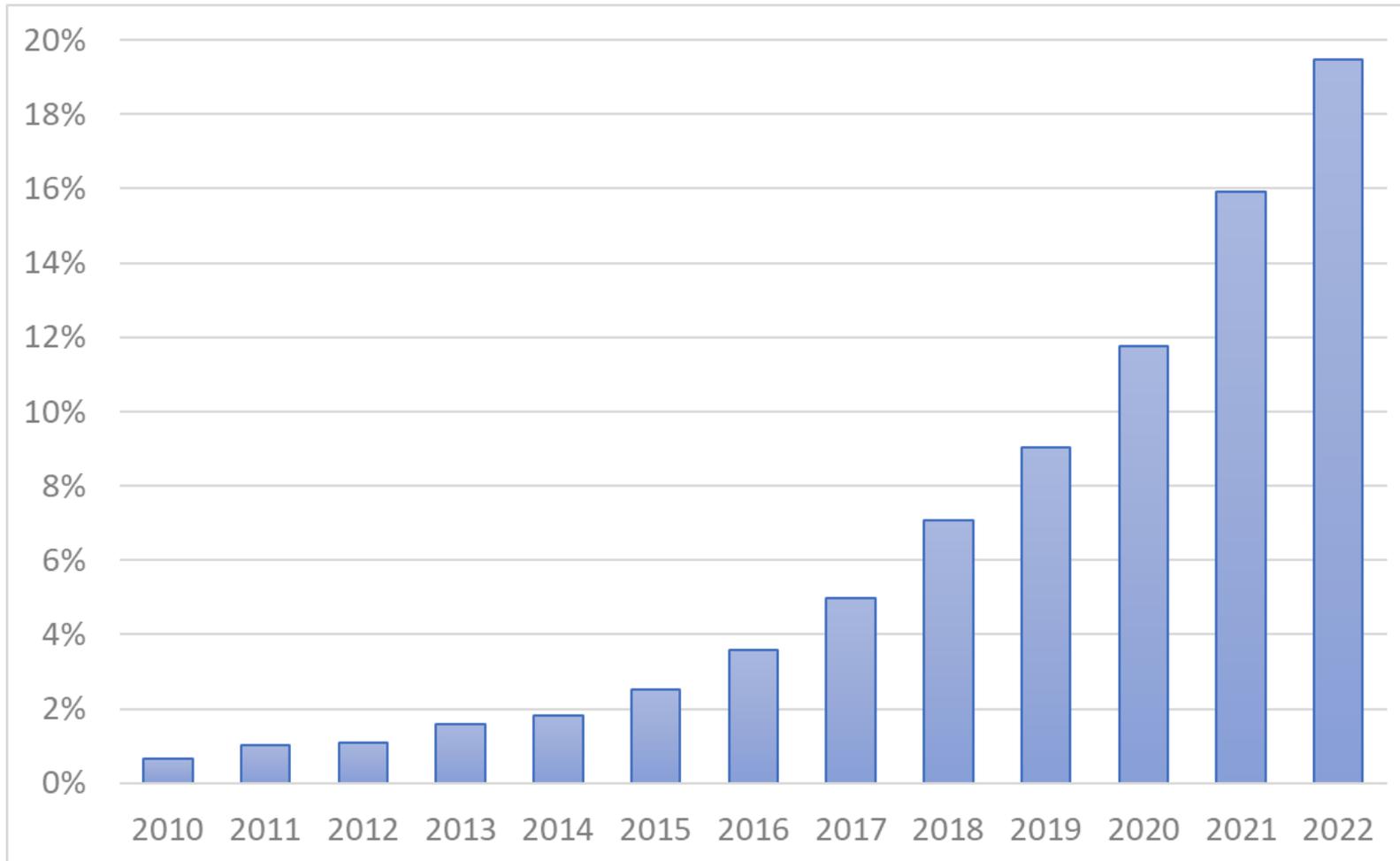
Cumulative number of Female Genotypes used in the AHDB-Dairy Genomic evaluations



Confirmed parentage of publishable females

	Sires	Dams
HOL	96	34
BRF	92	16
JER	83	46
AYR	83	16
GUE	70	53

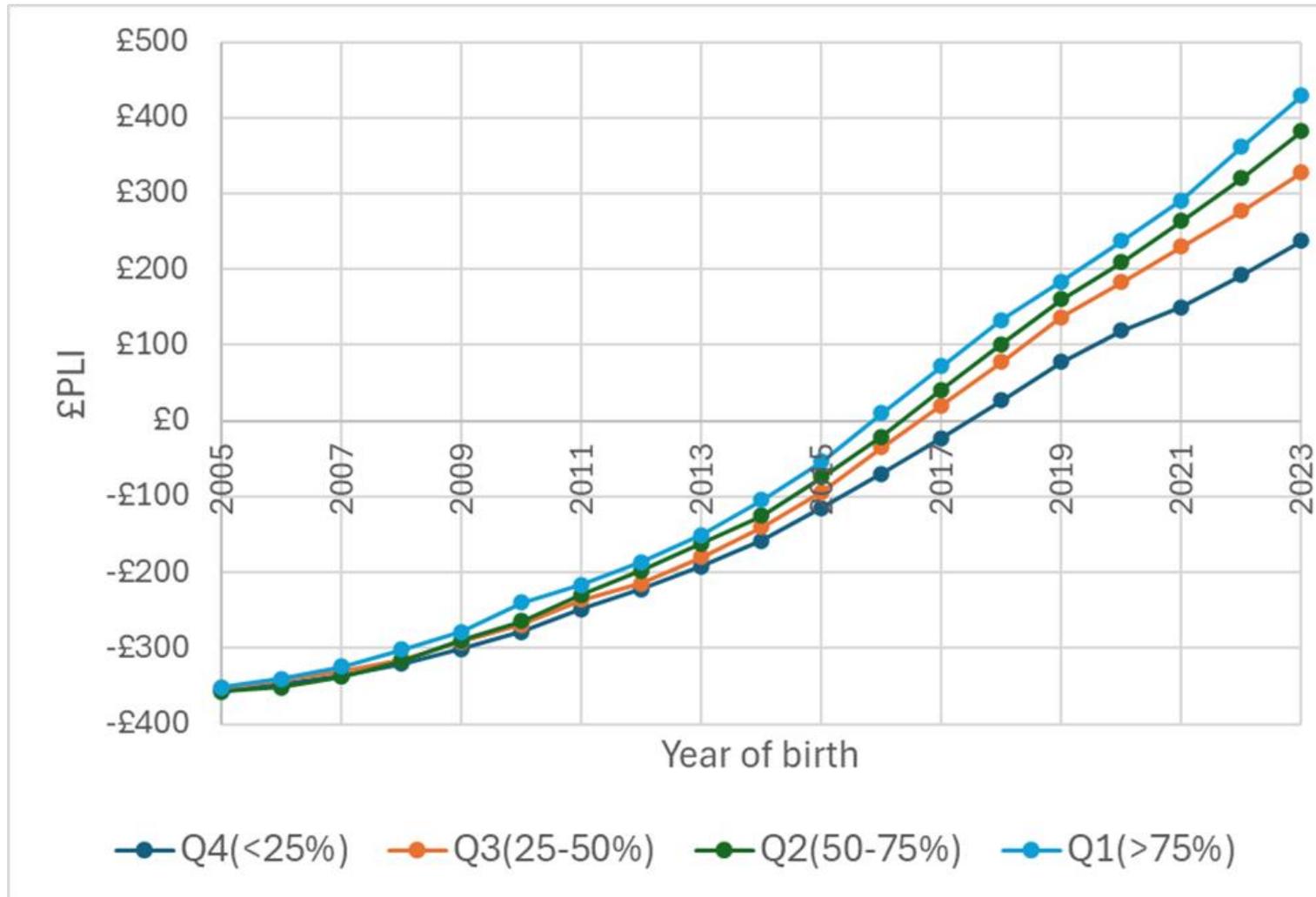
Proportion of females genotyped by Year of birth



*Across all breeds in
Apr'23 evaluation
(~400,000 per year)*



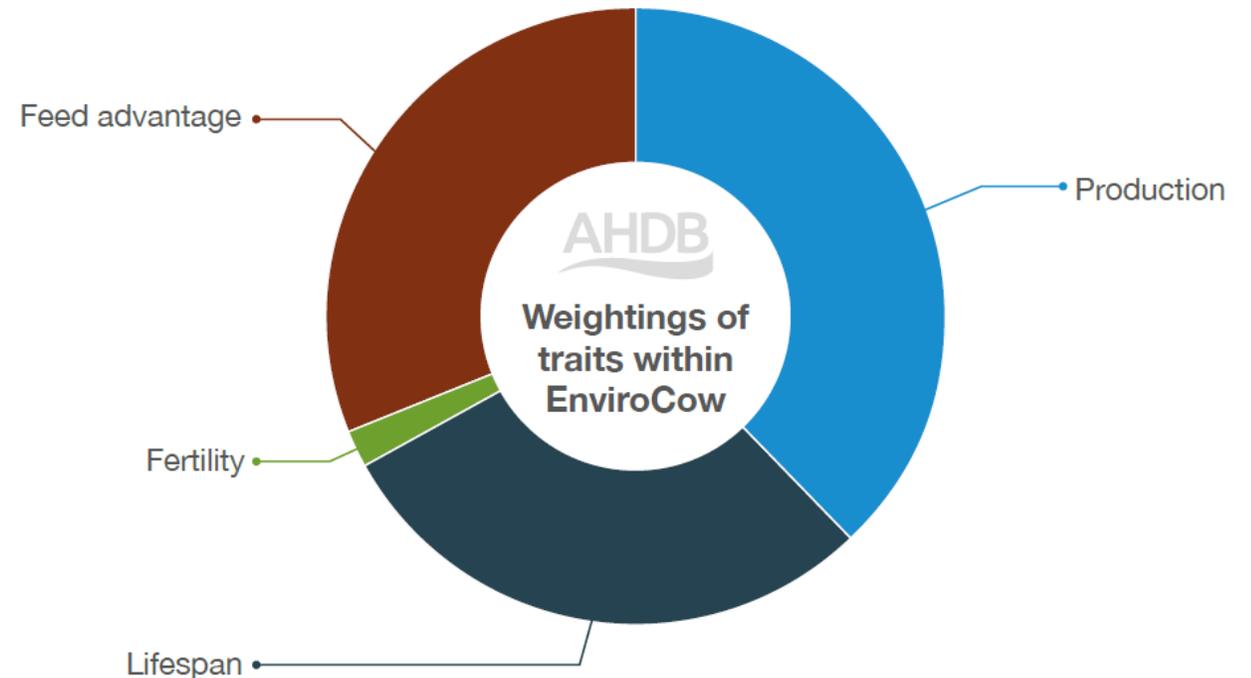
Effect of Genomic testing on genetic gain



EnviroCow index

Genetic index to reduce CO₂ per kg product produced

- CO₂ equivalents estimated based on feed intake affected by;
 - Production (Milk, Fat, Protein)
 - Lifespan
 - + Calf Survival
 - + Fertility
 - Feed Advantage
 - Feed Efficiency
 - Maintenance
 - + BCS



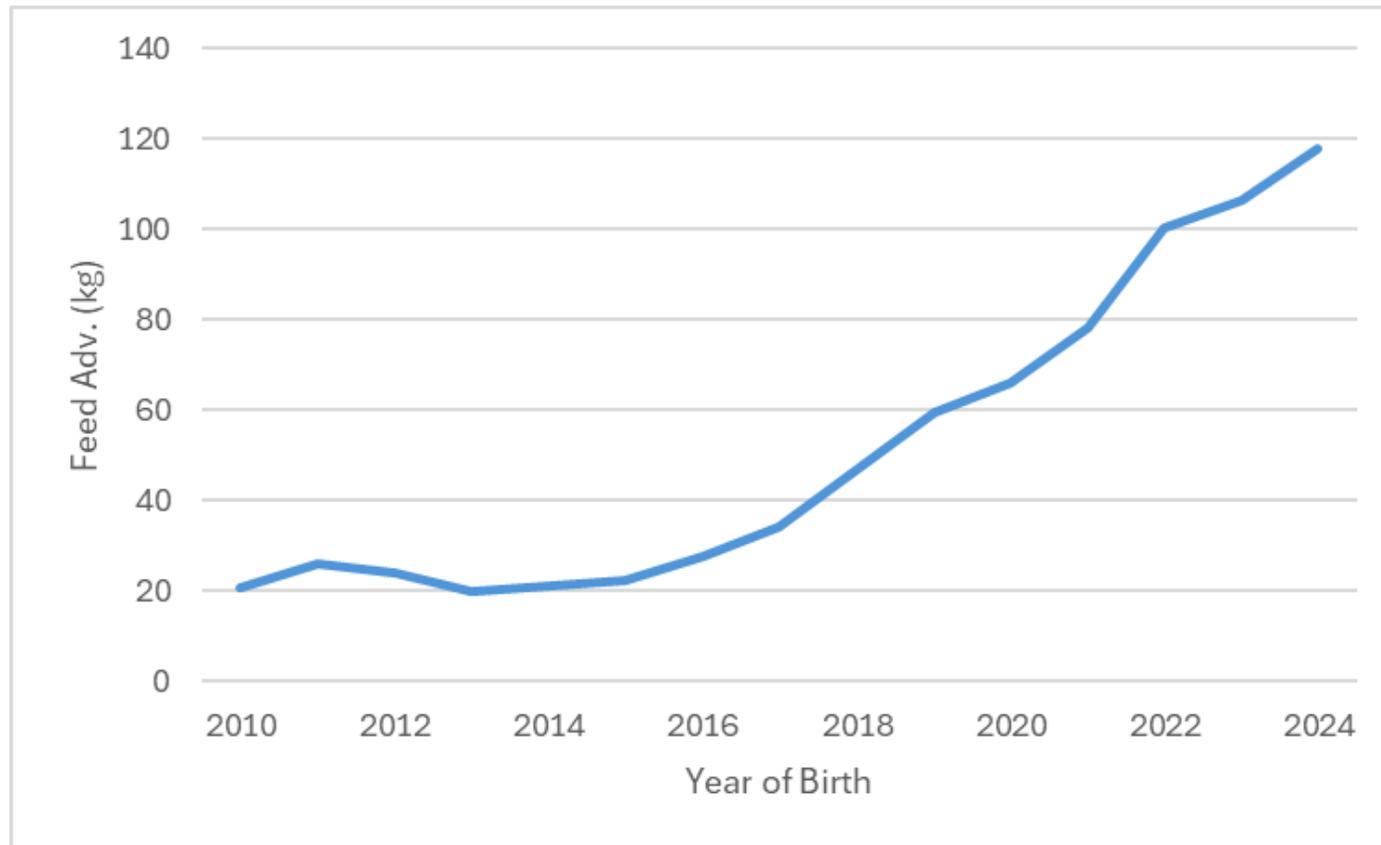
Expressed as standardised trait - Better animals score higher

➤ Information available on bulls and on the AHDB Herd Genetic Report for cows



Feed Advantage

- Identifies animals with better feed conversion that is represented as kilograms of dry matter intake saved during each lactation



Estimated lifetime impact of EnviroCow

- What can it achieve for your carbon footprint

Genetics is estimated to contribute a 20% reduction by 2040

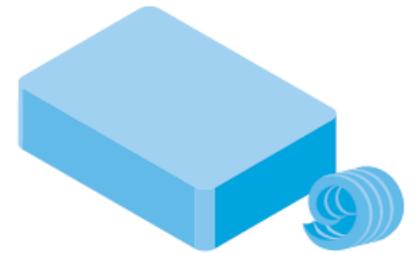
One-point higher score for EnviroCow equals:



10% less
greenhouse gas
emissions



10% less
feed



+ 33% higher
weight of fat and
protein in their
lifetime

Genomic inbreeding

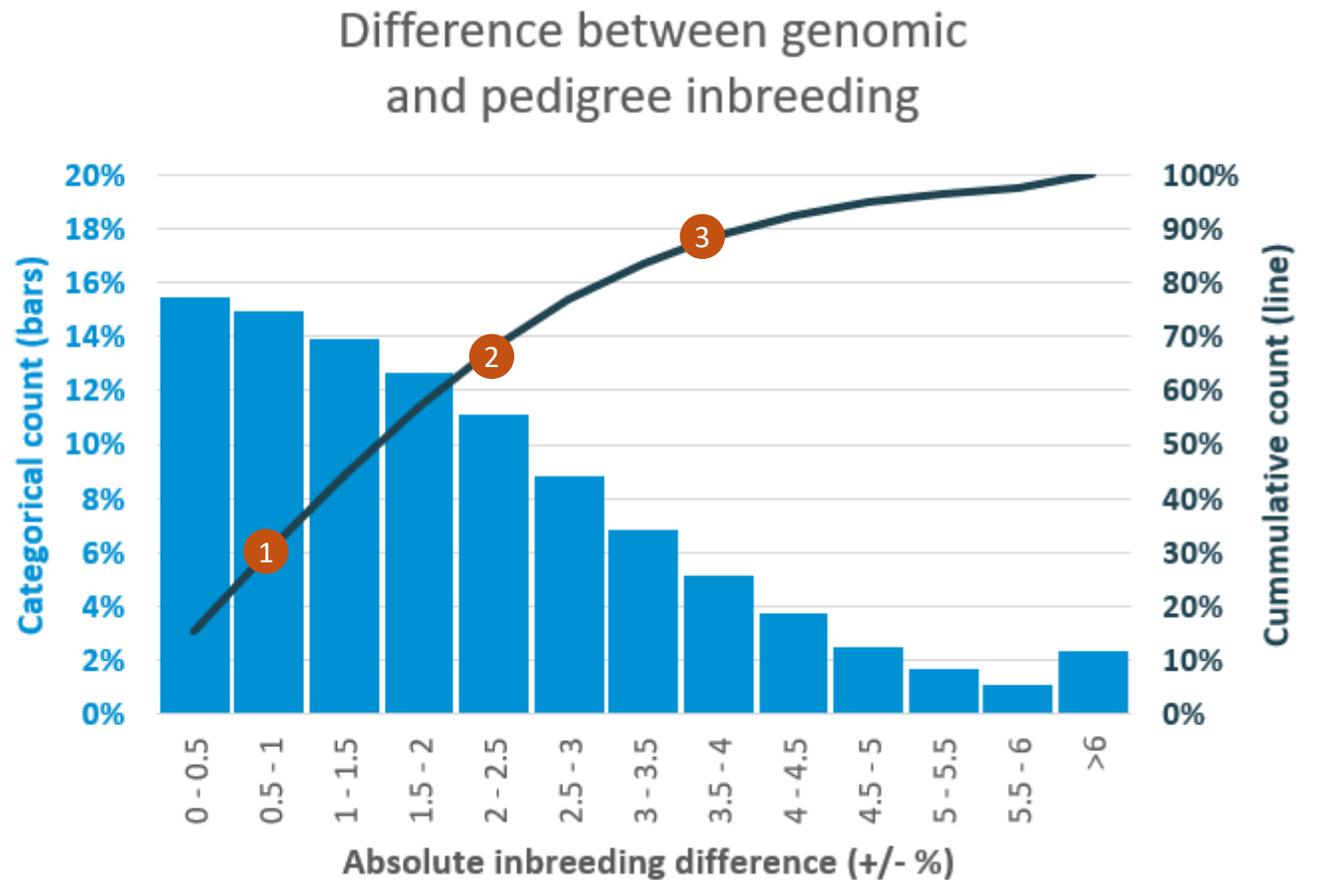
- Disadvantages of pedigree inbreeding
 - Pedigrees are not always complete
 - Pedigrees can be unreliable
 - Pedigree are not a direct measure of inbreeding

- Advantages of genomic inbreeding
 - Genomic inbreeding is not affected by shallow or incomplete pedigrees
 - Genomic estimates are a direct measure of inbreeding

Genomic inbreeding

- Genomic and pedigree inbreeding give similar results*, but not the same !
 - 90% correlation

- ① A third of animals differ less than 1%,
- ② two thirds of animals differ less than 2.5%
- ③ and 90% of animals differ less than 4%



*When the pedigree estimates are based on full pedigrees!!

Summary

- Uptake of genomics in the dairy industry continues to grow year on year
- Genomics only adds value if you add it to your toolbox
 - ✓ Earlier availability of information
 - ✓ More accurate genetic information

But you have to use it!



E: victoria.ashmore@ahdb.org.uk

M: 07586055079