


16 November 2024

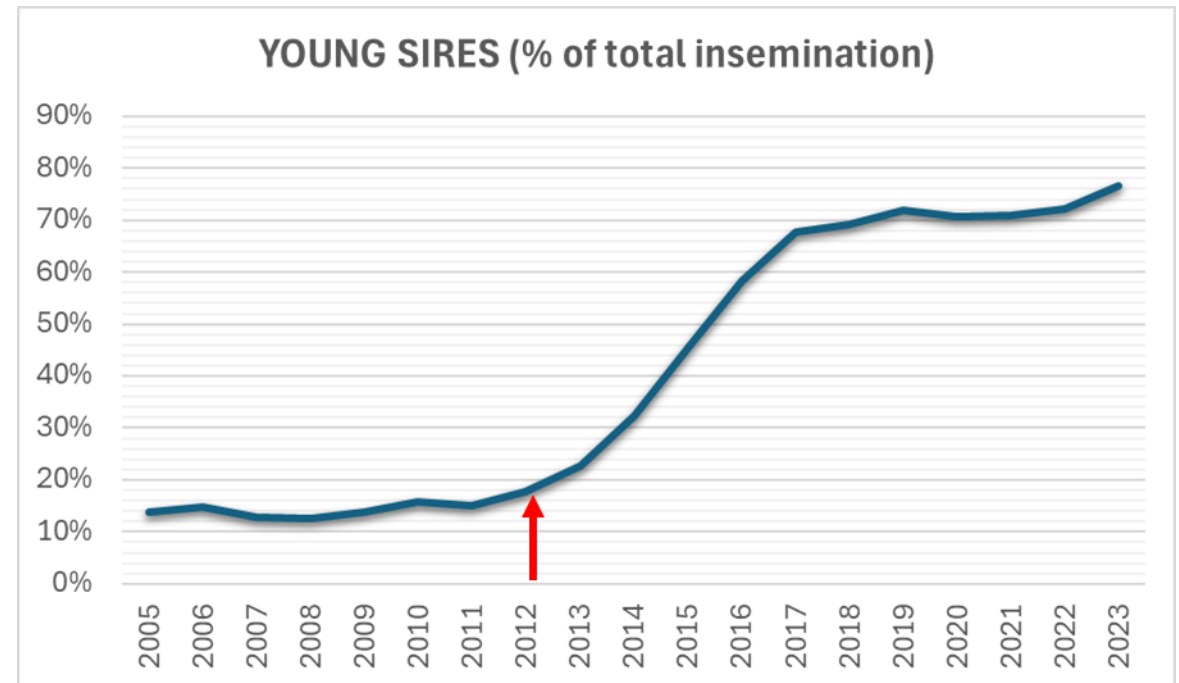
# What has Dairy learnt from DNA?

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# Holstein breeding in a snapshot

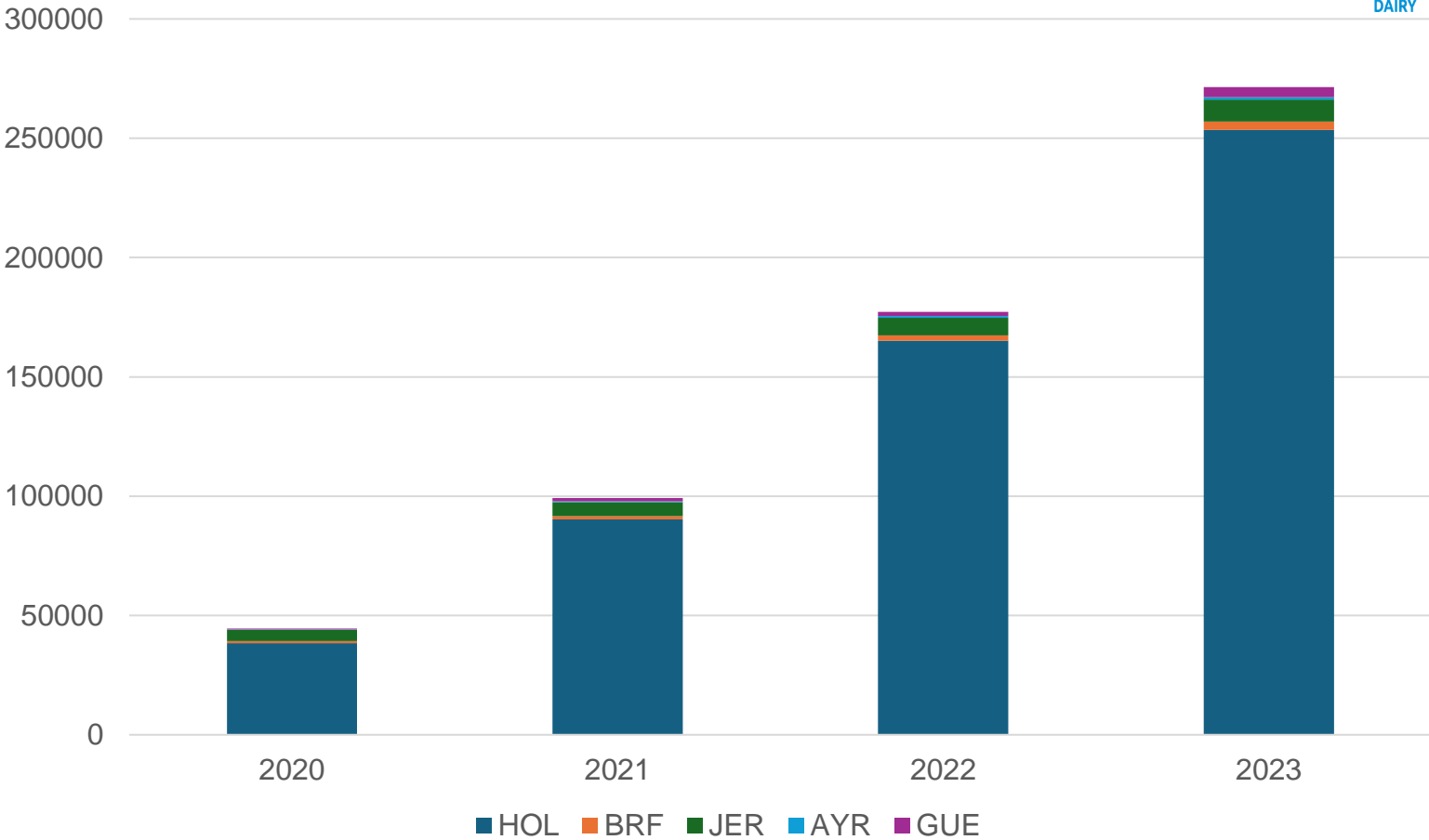
- Genomics introduced in 2012
- Use of genomic young sires
  - ✓ at ~70% of all dairy inseminations
  - doubling genetic progress ! 



# Where are we currently



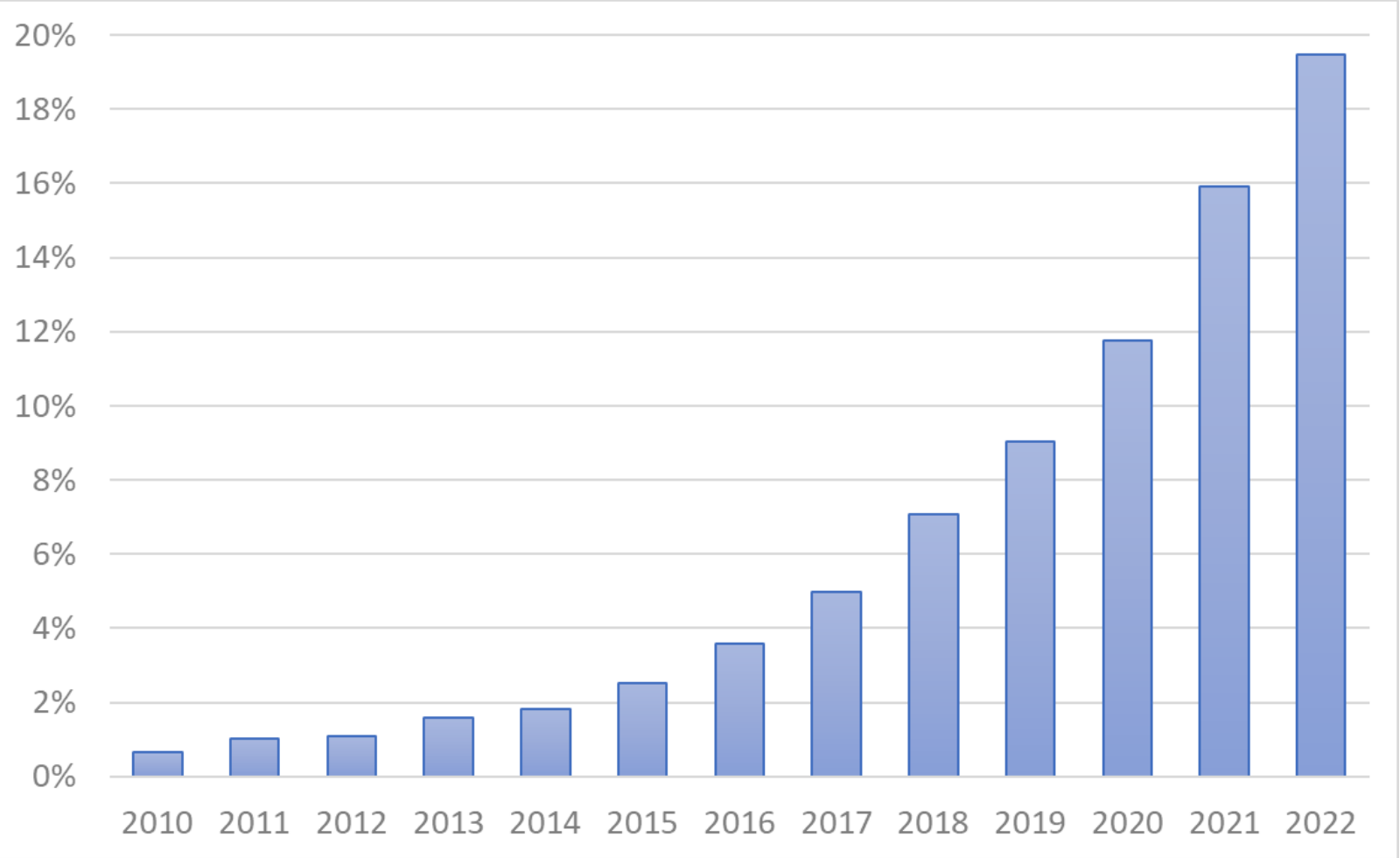
Cumulative number of Female Genotypes used in the AHDB-Dairy Genomic evaluations



Confirmed parentage of publishable females

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

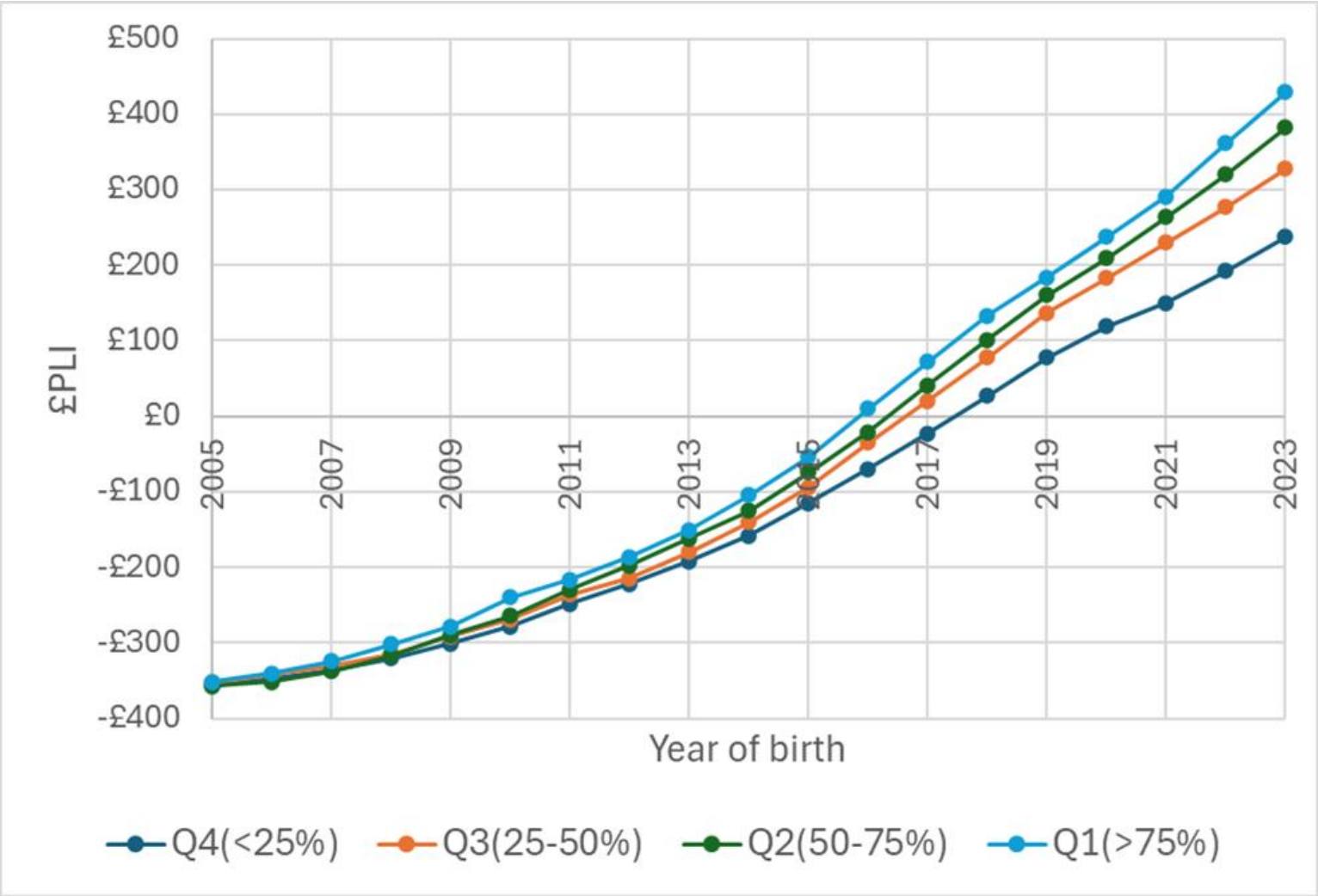
# Proportion of females genotyped by Year of birth



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



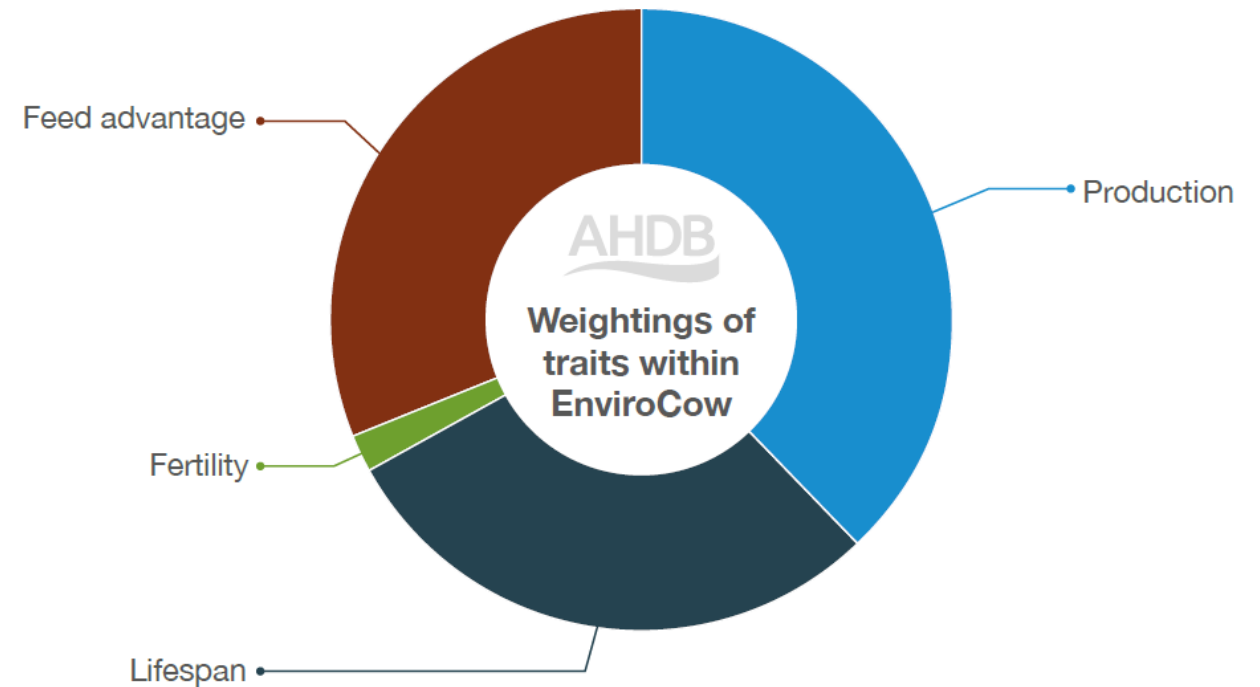
# Effect of Genomic testing on genetic gain



# EnviroCow index

Genetic index to reduce CO<sub>2</sub> per kg product produced

- CO<sub>2</sub> equivalents estimated based on feed intake affected by;
  - Production (Milk, Fat, Protein)
  - Lifespan
    - + Calf Survival
    - + Fertility
  - Feed Advantage
    - Feed Efficiency
    - Maintenance
    - + BCS



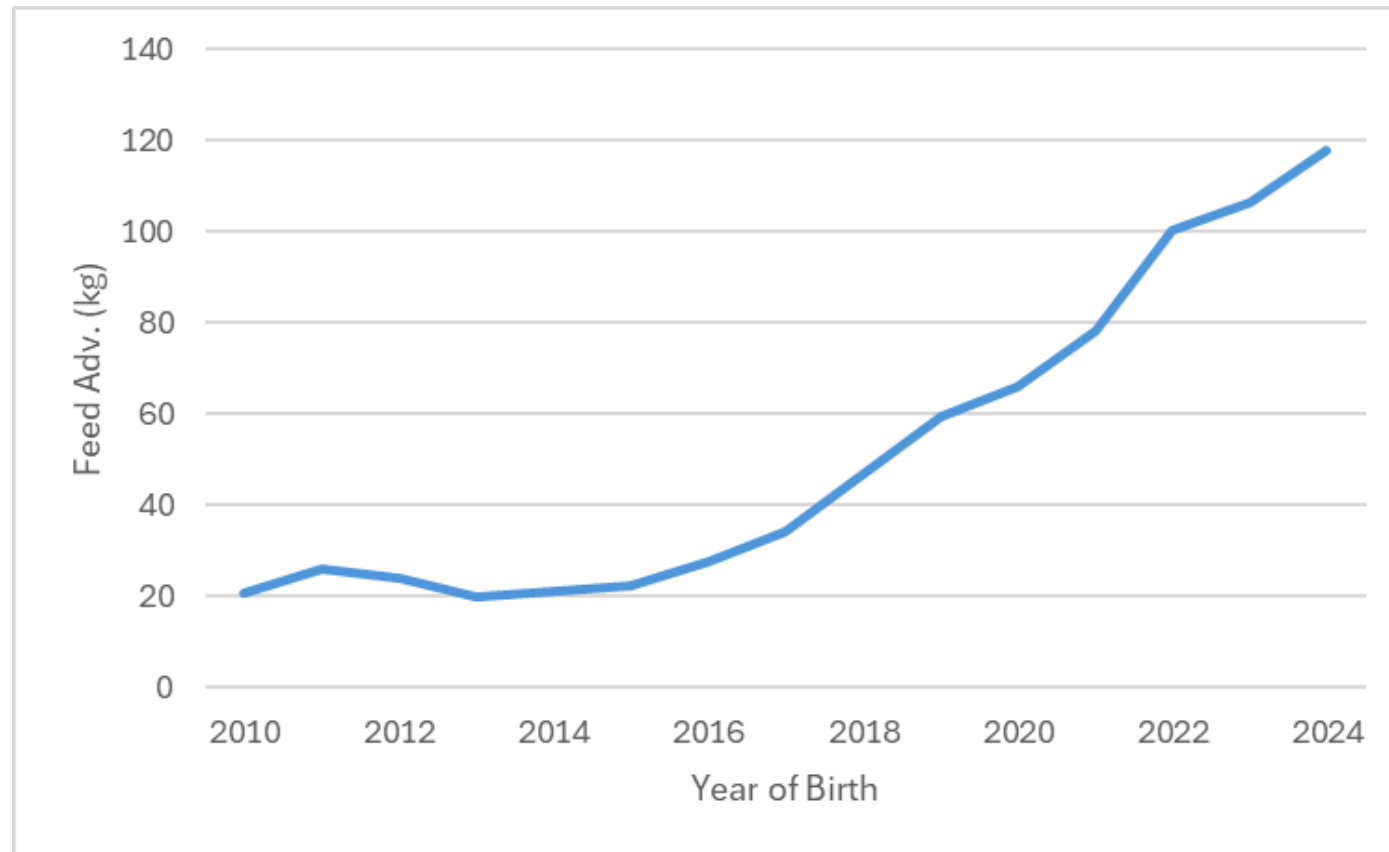
Expressed as standardised trait - Better animals score higher

➤ 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

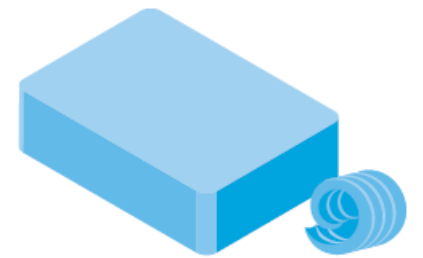
**One-point higher score for EnviroCow equals:**



**10% less**  
greenhouse gas  
emissions



**10% less**  
feed



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



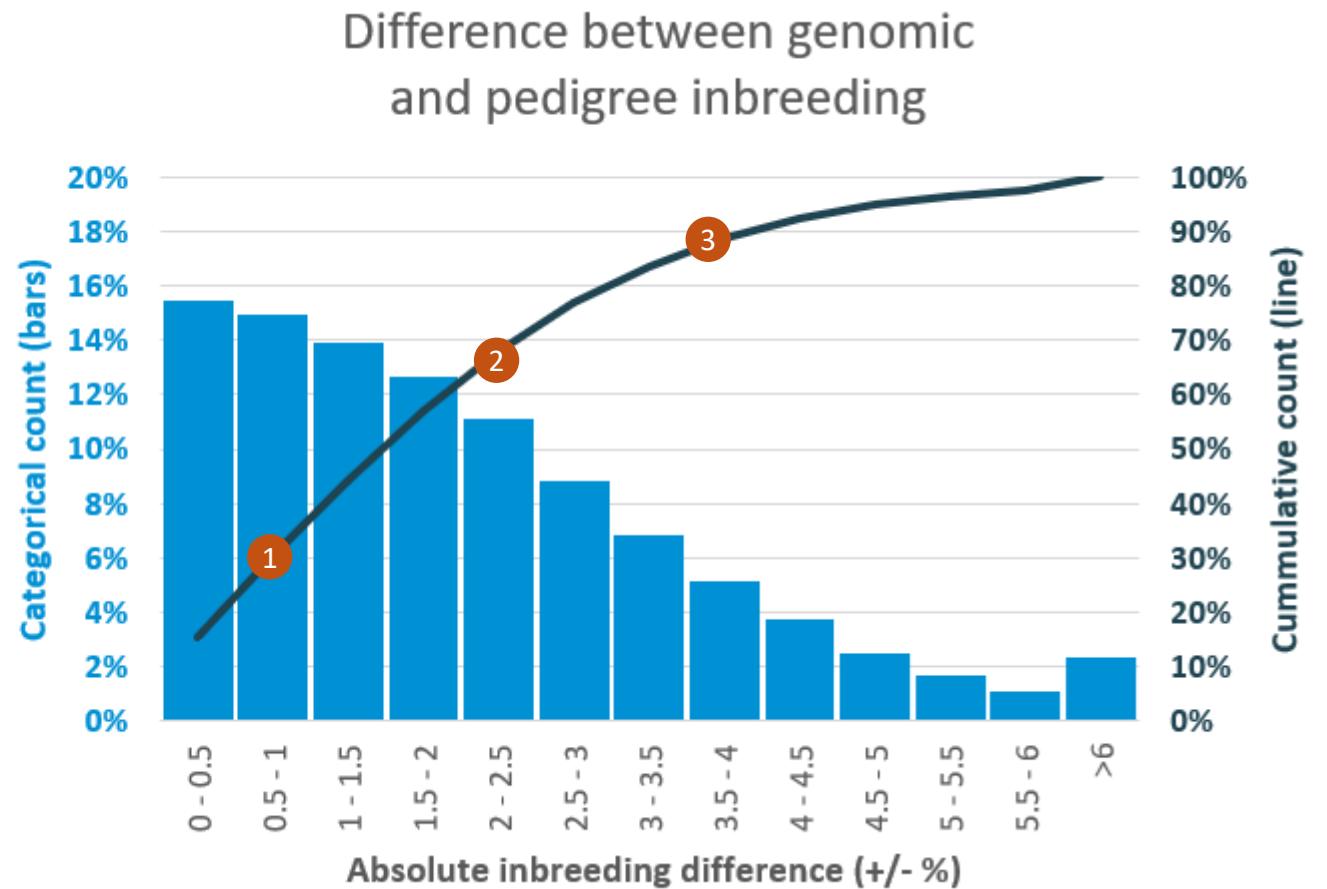
# Genomic inbreeding

- 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!



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