



# ***Breeding for Superior Beef Meat eating Quality***

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# Meat quality – why?

- >600,000 tonnes of beef produced in 2018 (Bord Bia)
- Exports €2.5bn
- 5<sup>th</sup> biggest exporter in the world



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## Beef exports to China set to increase ten-fold

The Bord Bia and Department of Agriculture predictions suggest that beef exports of €9 million last year will grow to €120m by the end of 2020.



## €7.75 million worth of Irish beef exported to US up to October

Sylvester Phelan | Jan 23, 2019, 6:29pm



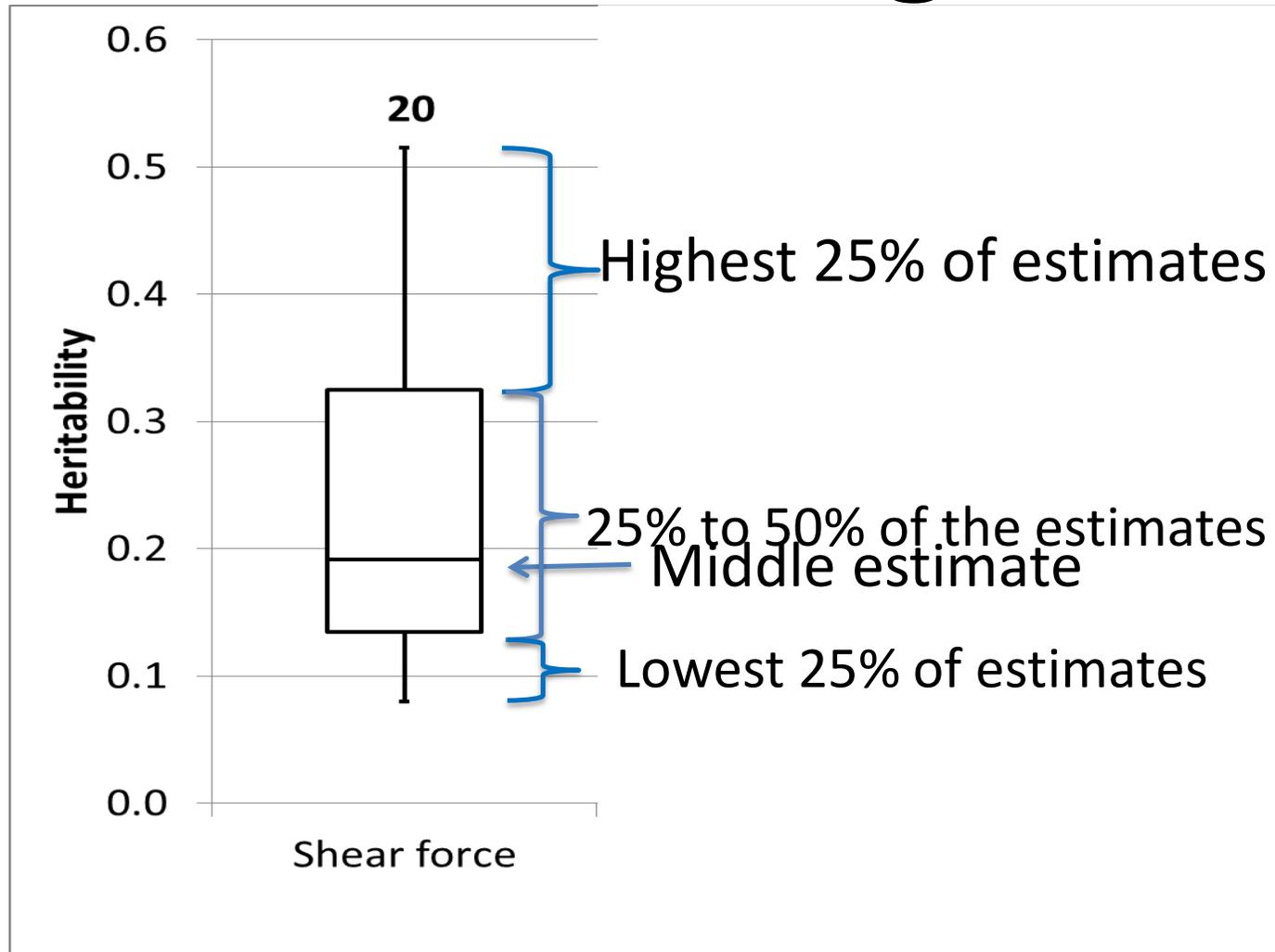
# Can we breed for it?



Huge improvements in meat quality in recent years..

**Where will the next jump in quality come from?**

# How much is genetics?



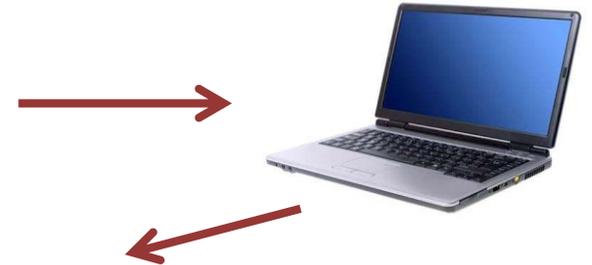
# Genetic Evaluations

## What?

A way to rank animals based on their (and/or their family members) performance for a certain trait(s)

## How?

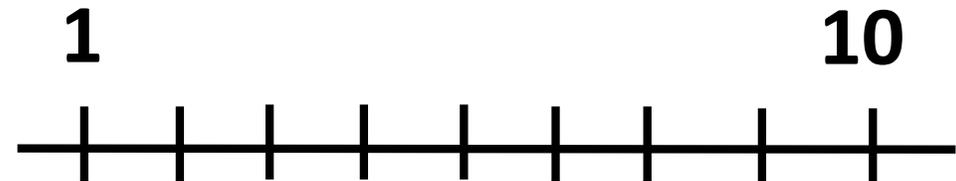
Meat quality data, pedigree information & other info



Estimated breeding values (EBVs) for **all** animals  
&  
Reliability figure – level of confidence

# The Data

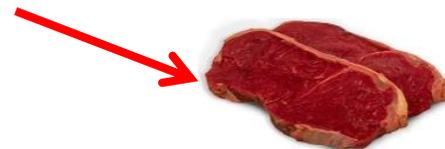
- Currently >5,000 cattle slaughtered
- Range of phenotypes collected including **sensory analysis of meat**
  - Trained panellists
    - Tenderness
    - Juiciness
    - Flavour



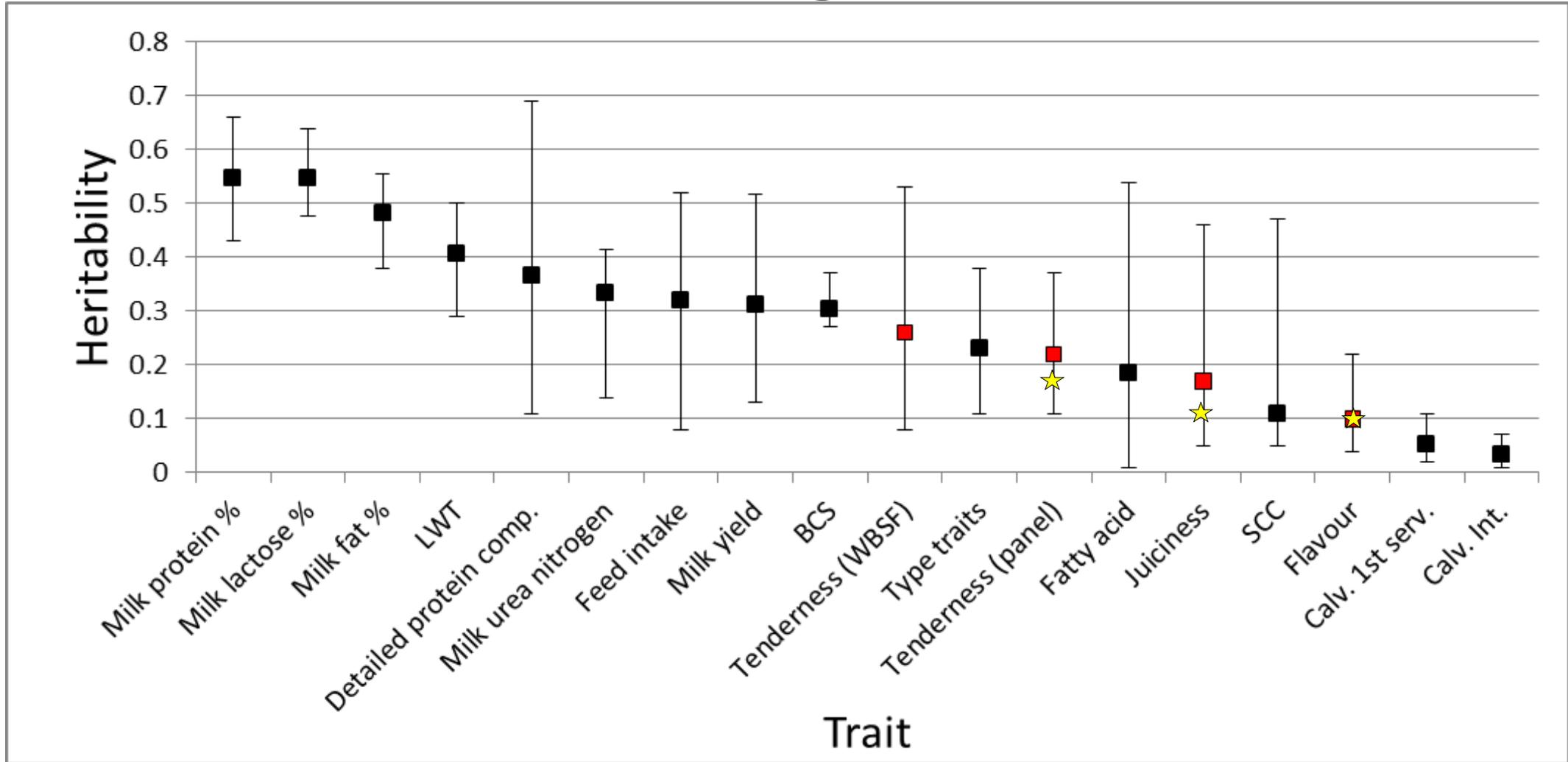
# How much is genetics?

$$h^2 = \frac{\text{Genetic variance}}{\text{Phenotypic variance}}$$

	$h^2$ (SE)
Tenderness	0.15 (0.04)
Juiciness	0.11 (0.06)
Flavour	0.12 (0.04)



# How much is genetics?



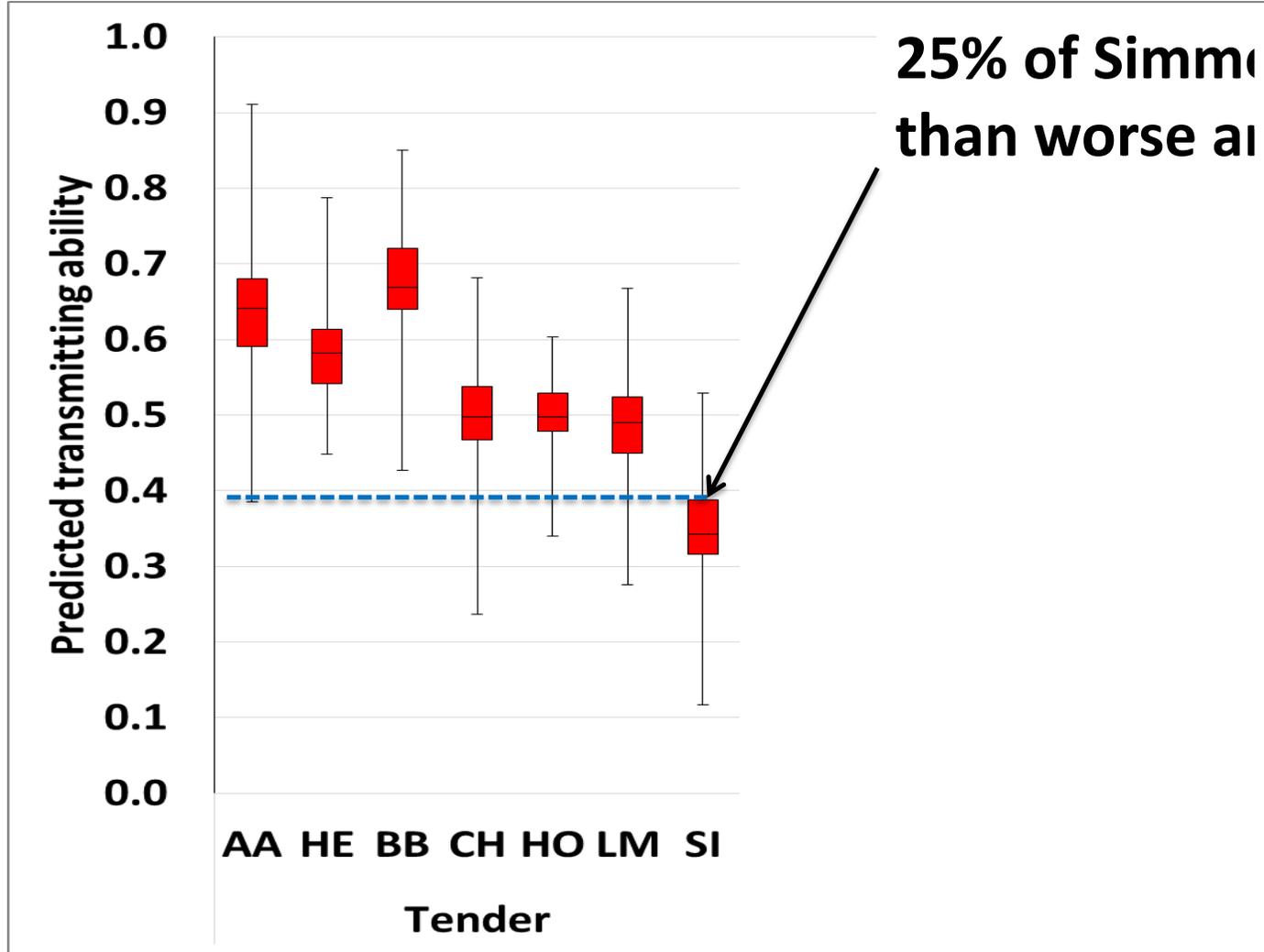
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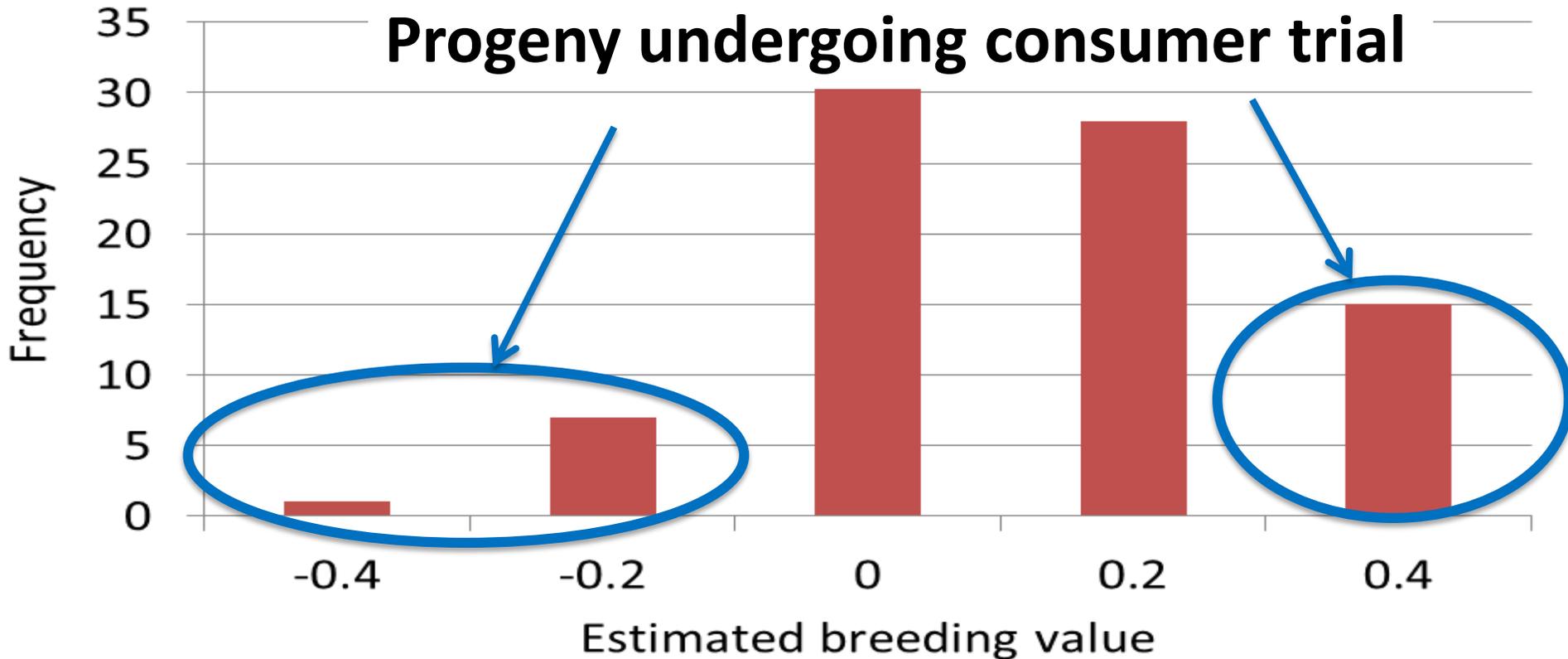


# Within breed differences

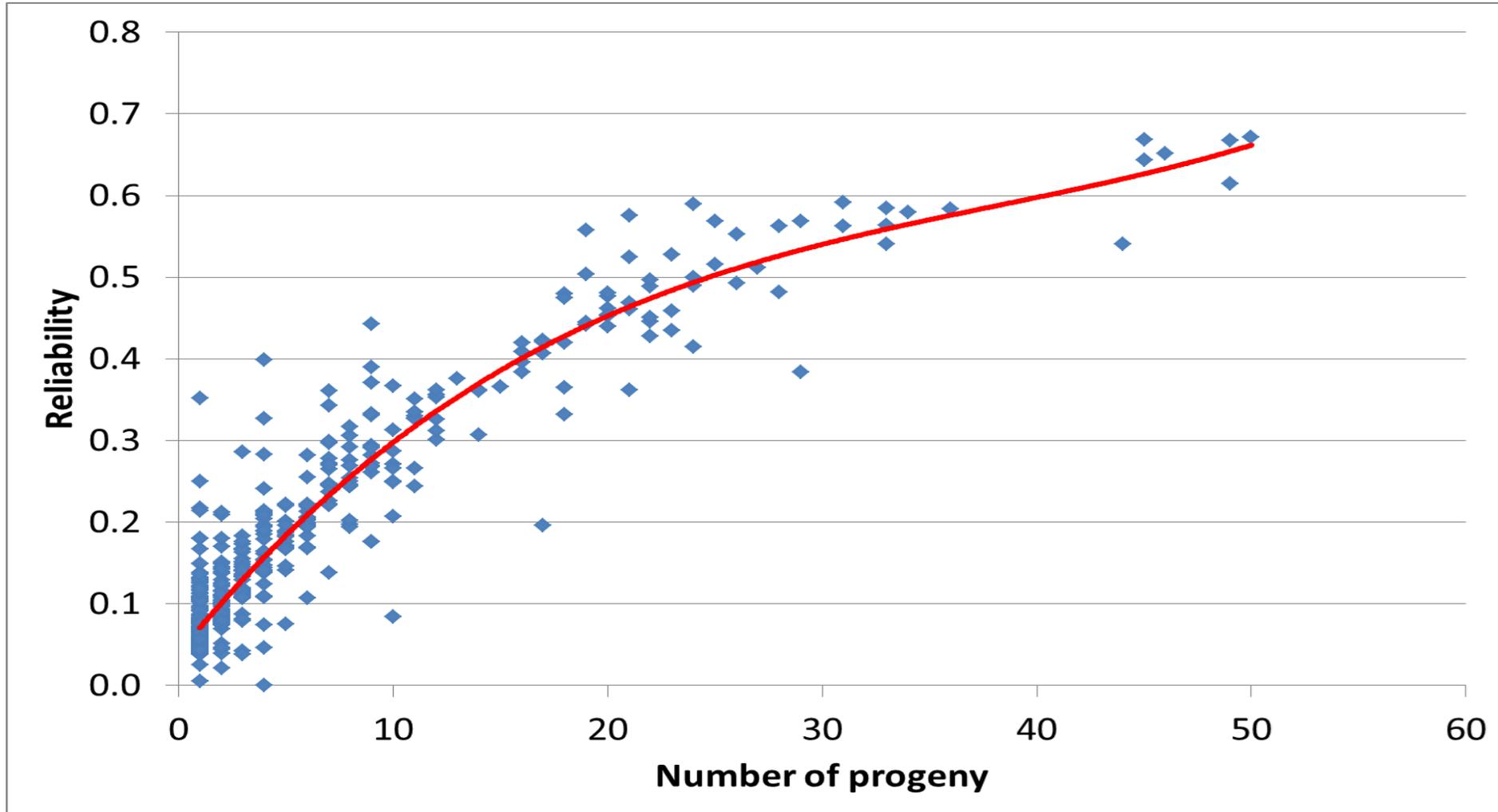


# Genetic evaluations

## EBVs of sires with reliability of $\geq 30\%$



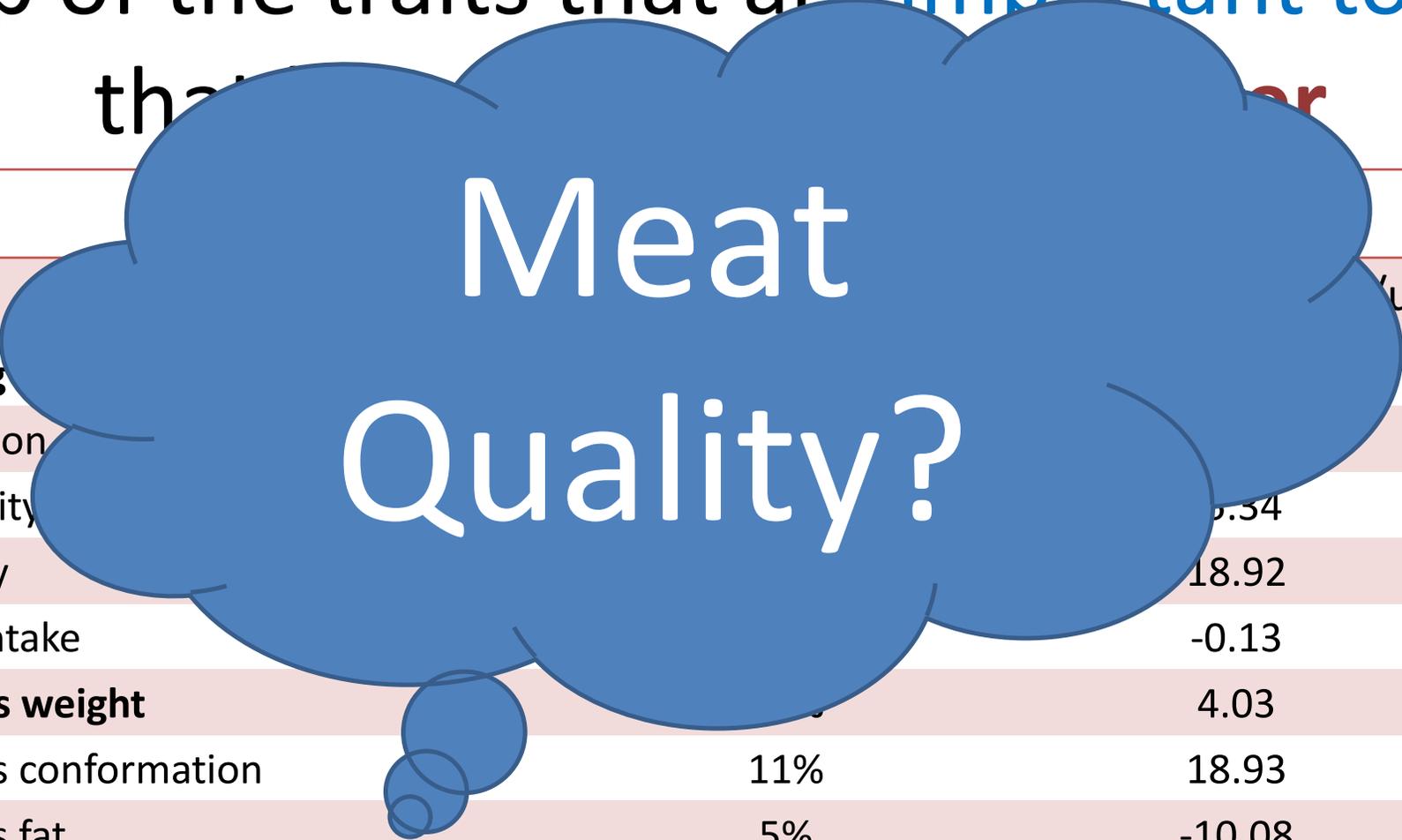
# Importance of data



# Terminal Index

Made up of the traits that are important to farmers

that are important to farmers



Trait	Weighting	Value (unit)
Calving		
Gestation		
Mortality		5.34
Docility		18.92
Feed intake		-0.13
<b>Carcass weight</b>		4.03
Carcass conformation	11%	18.93
Carcass fat	5%	-10.08

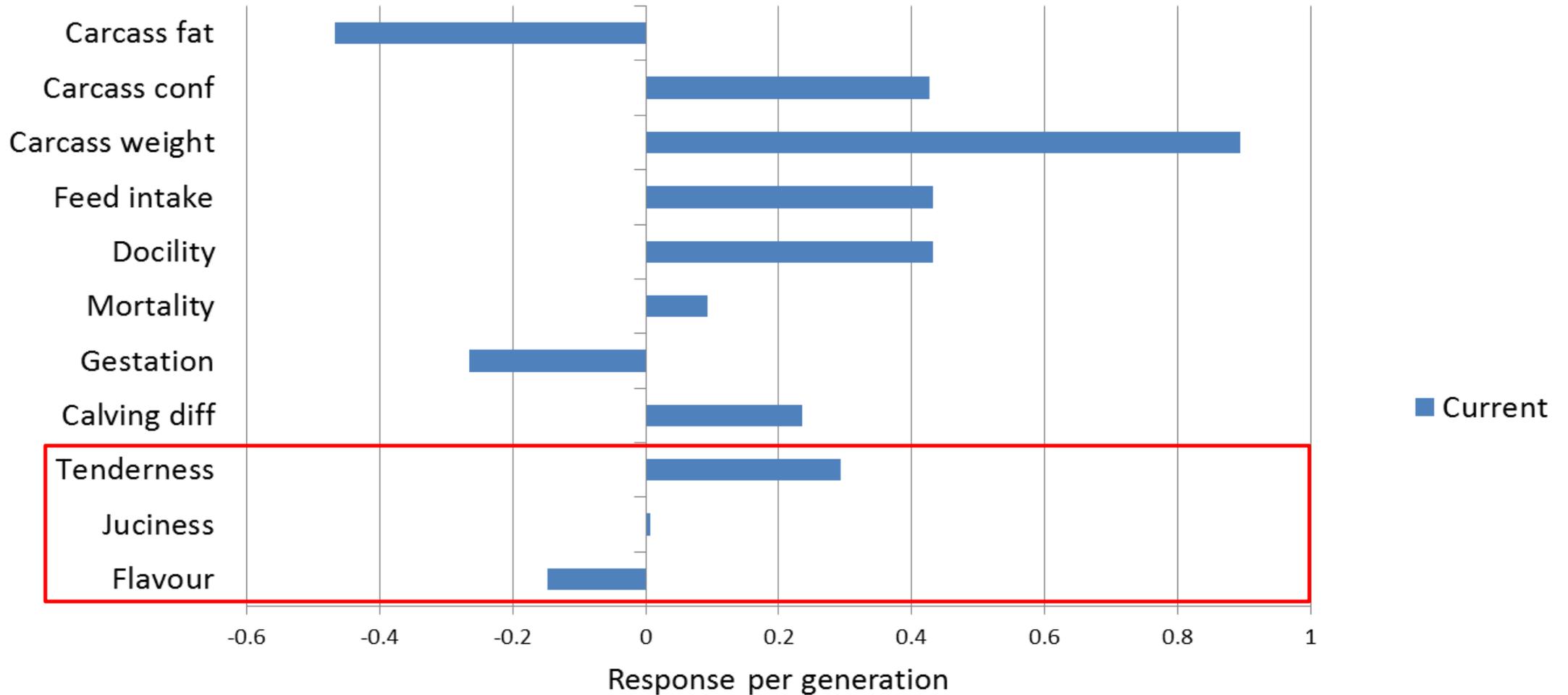
# What is the terminal index currently doing to MEQ traits?



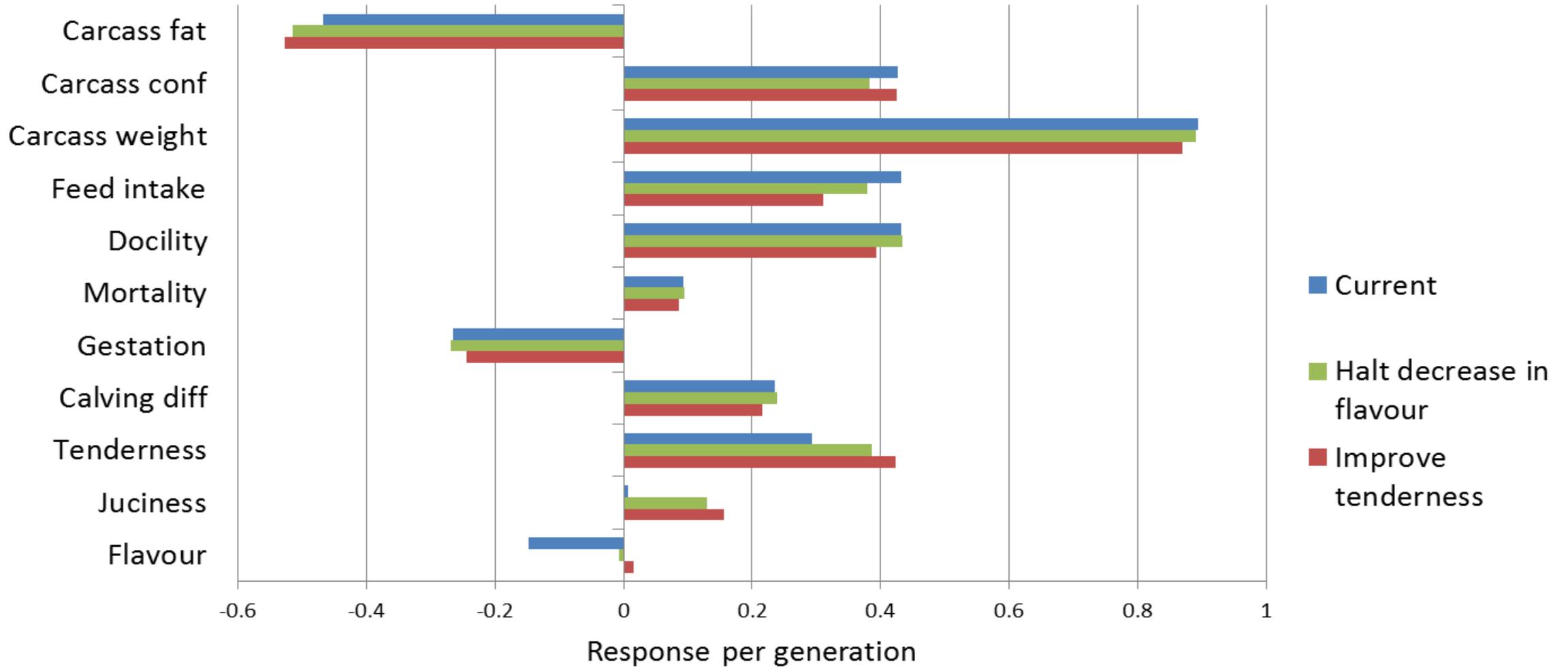
The changes in the eating quality traits per generation:

- Tenderness will **increase** by 0.07 units
- Juiciness will remain **constant**
- Flavour will **decrease** by 0.03 units

# Selecting for MEQ traits



# Selecting for MEQ traits



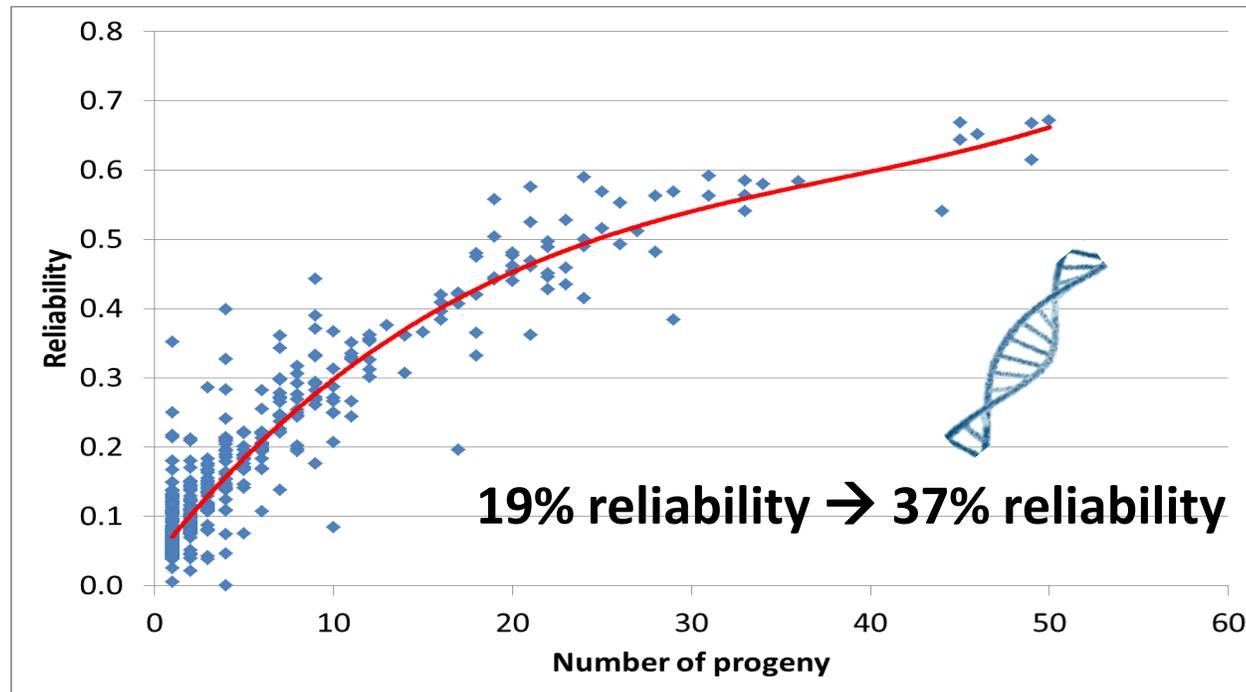
# Take home messages

1. If factory process is streamlined **breeding could bring a massive improvement** to meat eating quality
2. Ireland will launch meat quality EBVs for AI sires with the hope of identifying superior sires



# Future work

## 3. Work on-going to incorporate GENOMICS to meat eating quality index index



# Thank you for your attention



## Any questions?