How to identify the best rams to meet customer requirements

Siobhan Slayven

Overview

Meat quality

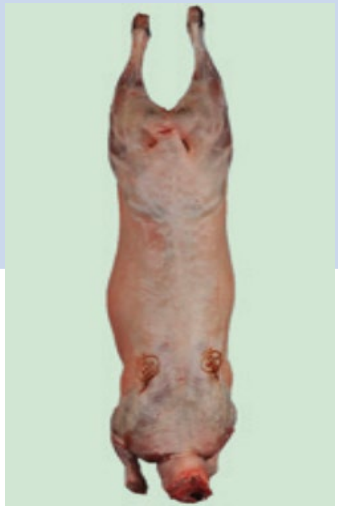
- What is it?
- What affects it?
- How do we measure it?
- Why is shear force important?

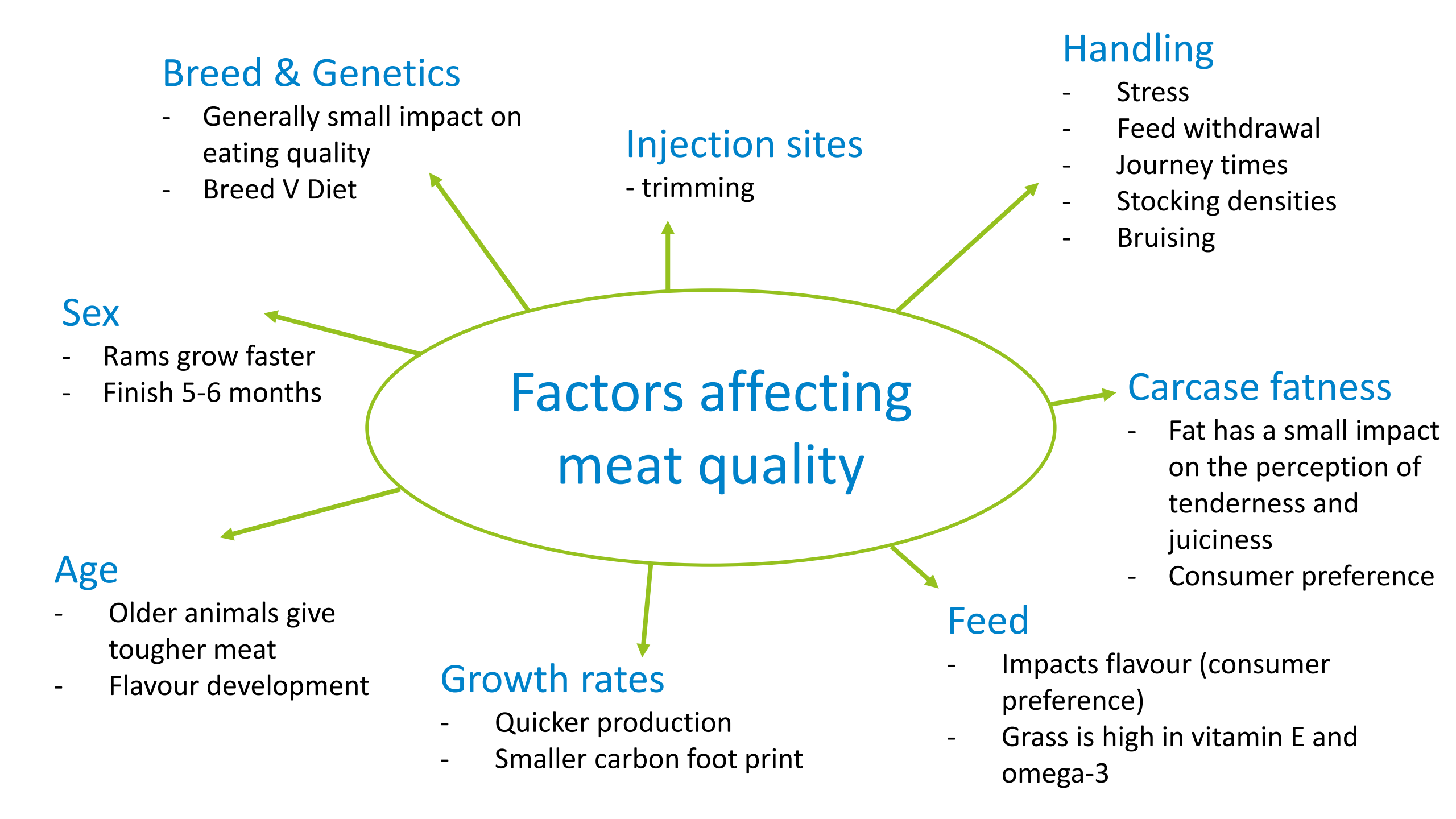
Primal data

- What is primal data?
- Is it inheritable?
- Next steps

What is quality?

Carcase quality	Meat quality
- conformation/fat class - yield of saleable meat - defects & blemishes - weight	**Appearance** - colour - drip **Eating quality** - tenderness - flavour - juiciness

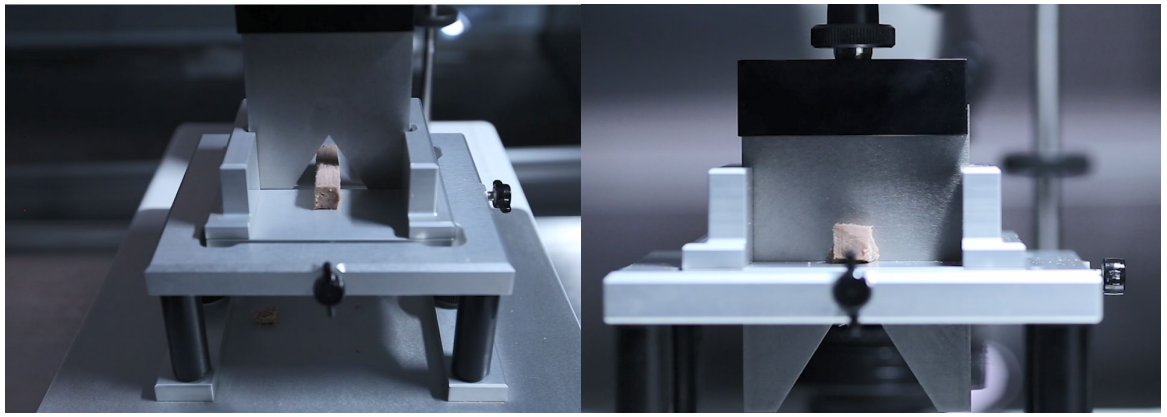



Factors affecting meat quality
Breed & Genetics
- Generally small impact on eating quality
- Breed V Diet
Injection sites
- trimming
Handling
- Stress
- Feed withdrawal
- Journey times
- Stocking densities
- Bruising
Sex
- Rams grow faster
- Finish 5-6 months
Carcase fatness
- Fat has a small impact on the perception of tenderness and juiciness
- Consumer preference
Age
- Older animals give tougher meat
- Flavour development
Growth rates
- Quicker production
- Smaller carbon foot print
Feed
- Impacts flavour (consumer preference)
- Grass is high in vitamin E and omega-3

Measuring quality

- pH – probes, often measuring temperature too
- Colour – objective or subjective
- Conformation – trained operative or VIA
- Marbling – grading cards
- Tenderness – taste panel or shear force YouTube - the shear force of meat quality

Shear force

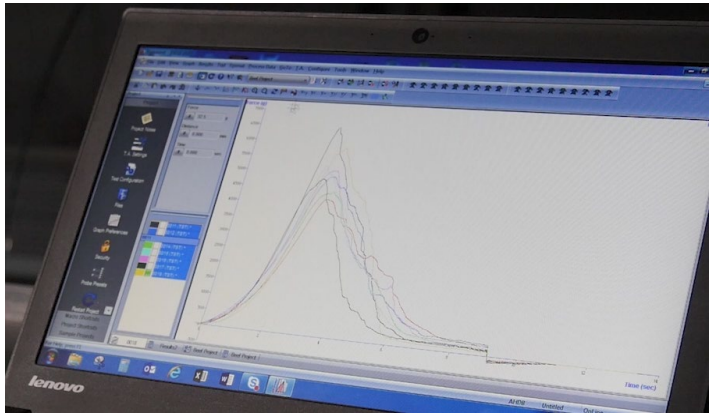


Cooking & cooling

Testing

Cutting

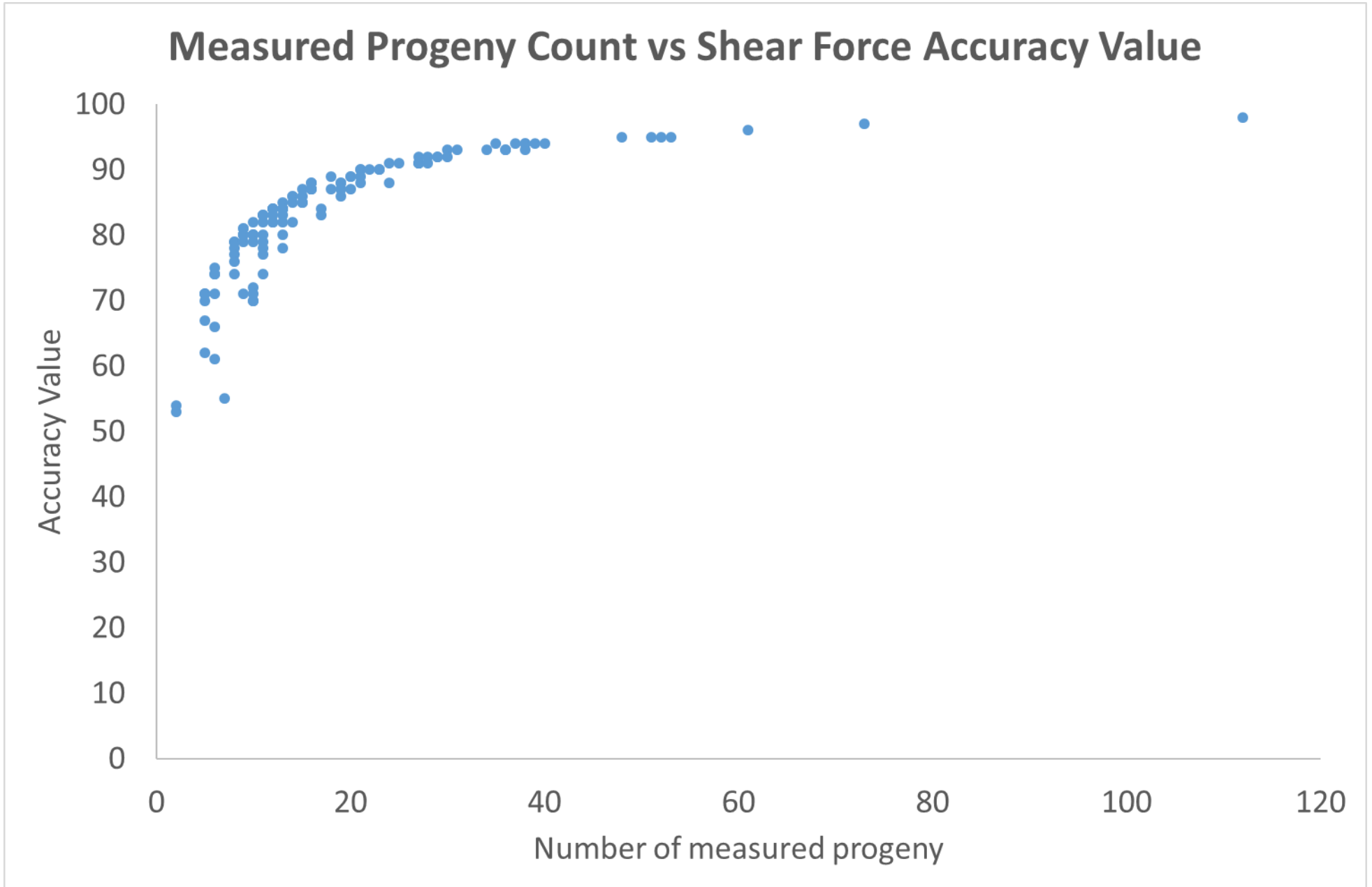
Analysing

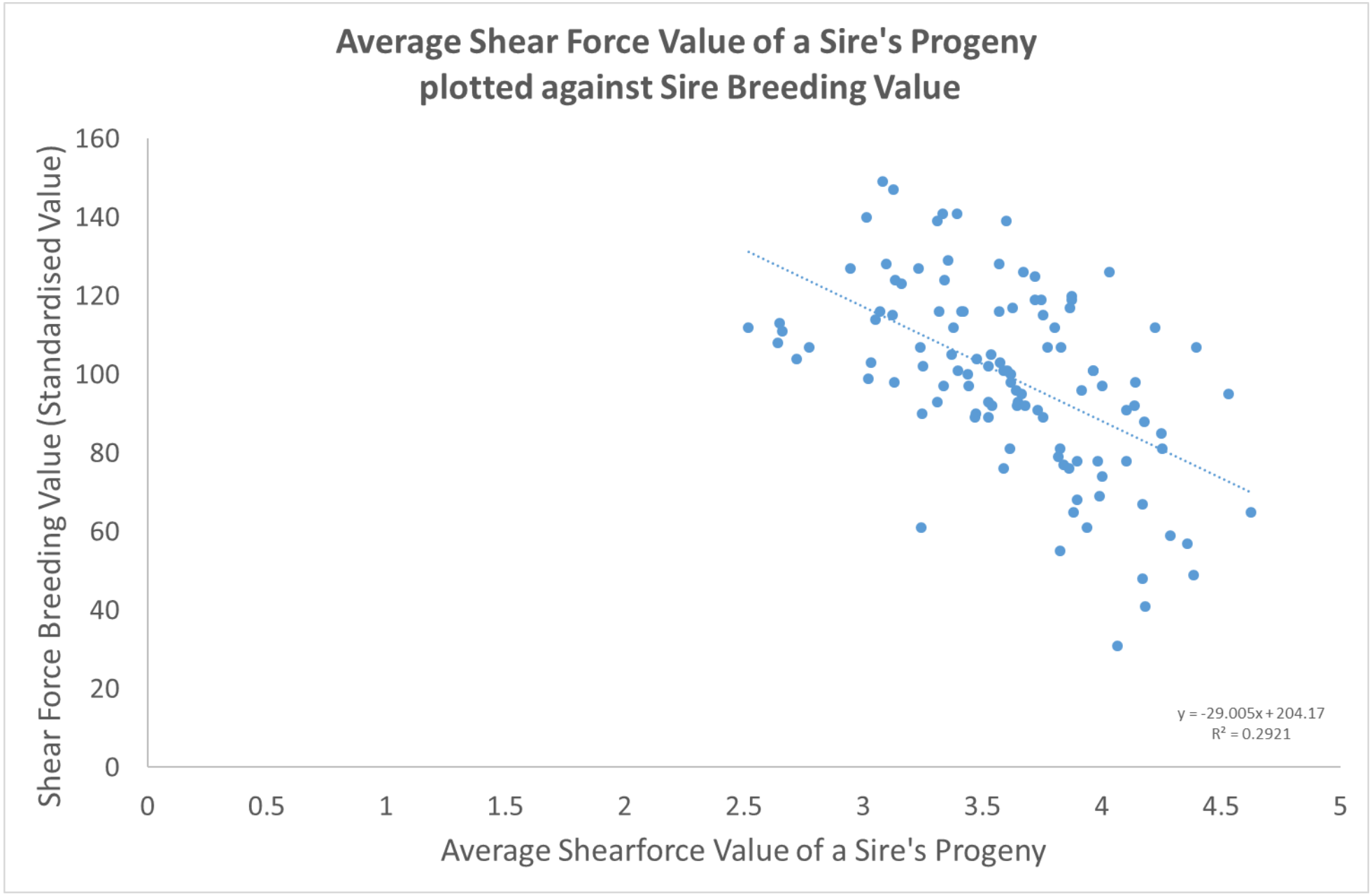


RamCompare Data

- 2462 shear force records to date (not counting 2019 lamb crop)
- 130 sires represented - only 15 had <8 measured progeny
  - Median progeny count =14, Average progeny count = 19

Top Ram for Shear Force
Charollais, Canahars Panache


Measured Progeny Count vs Shear Force Accuracy Value
Accuracy Value
100
90
80
70
60
50
40
30
20
10
0
0
20
40
60
80
100
120
Number of measured progeny


Average Shear Force Value of a Sire's Progeny plotted against Sire Breeding Value
Shear Force Breeding Value (Standardised Value)
160
140
120
100
80
60
40
20
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
Average Shearforce Value of a Sire's Progeny
y = -29.005x + 204.17
R² = 0.2921

RamCOMPARE

AHDB
AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD

Primal data

Update from Samuel Boon

BEEF & LAMB

Why study primal data?

- It is expensive to collect primal data - so why do we do it?

- To understand:
  - Variation in the trait - ability to manipulate yield
  - Heritability of the trait

- Relationship with other more easily measured traits – like u/sound & CT

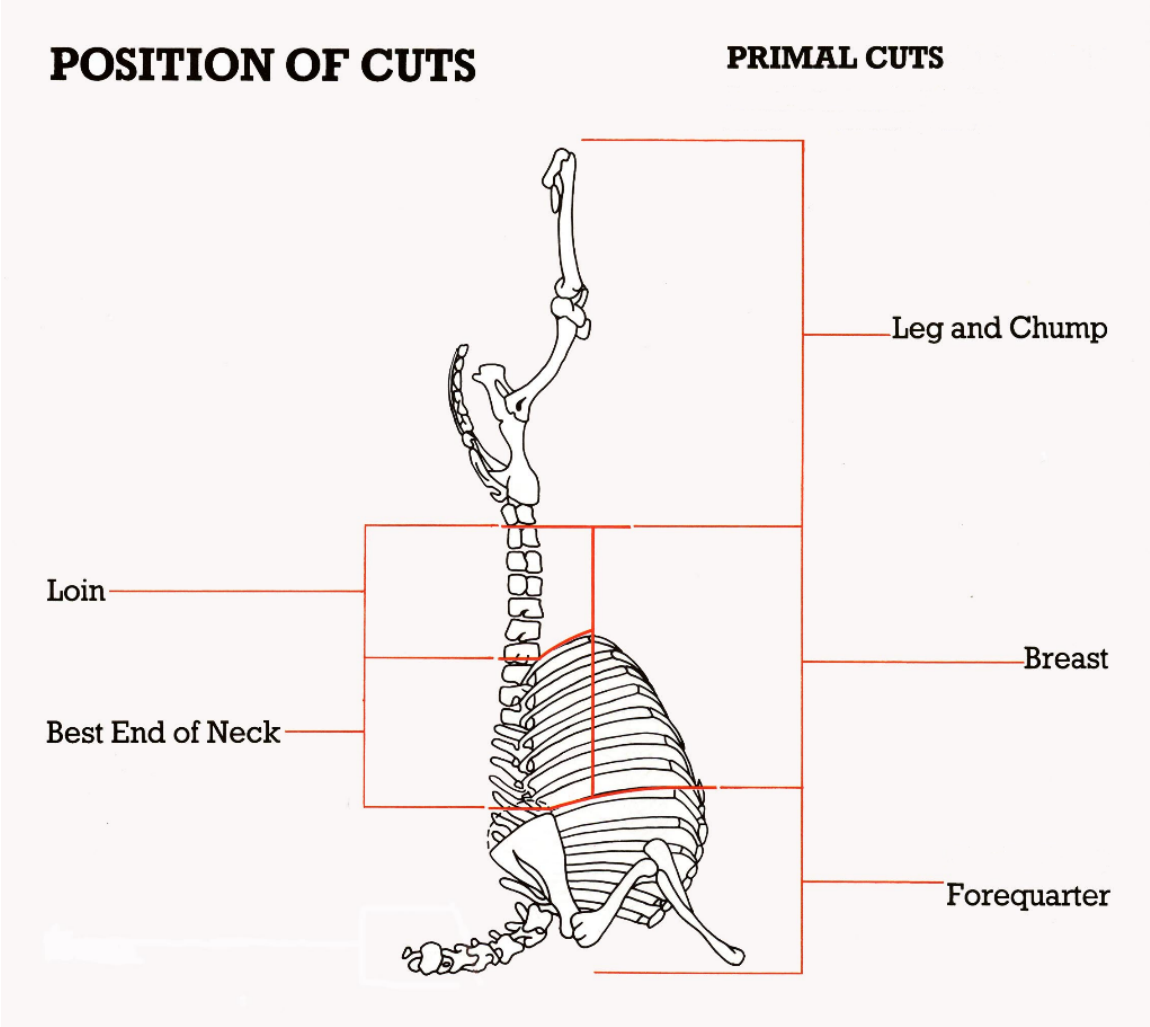
- Data to understand “value”

  …to whom? how is this measured in real life? how could this be rewarded?

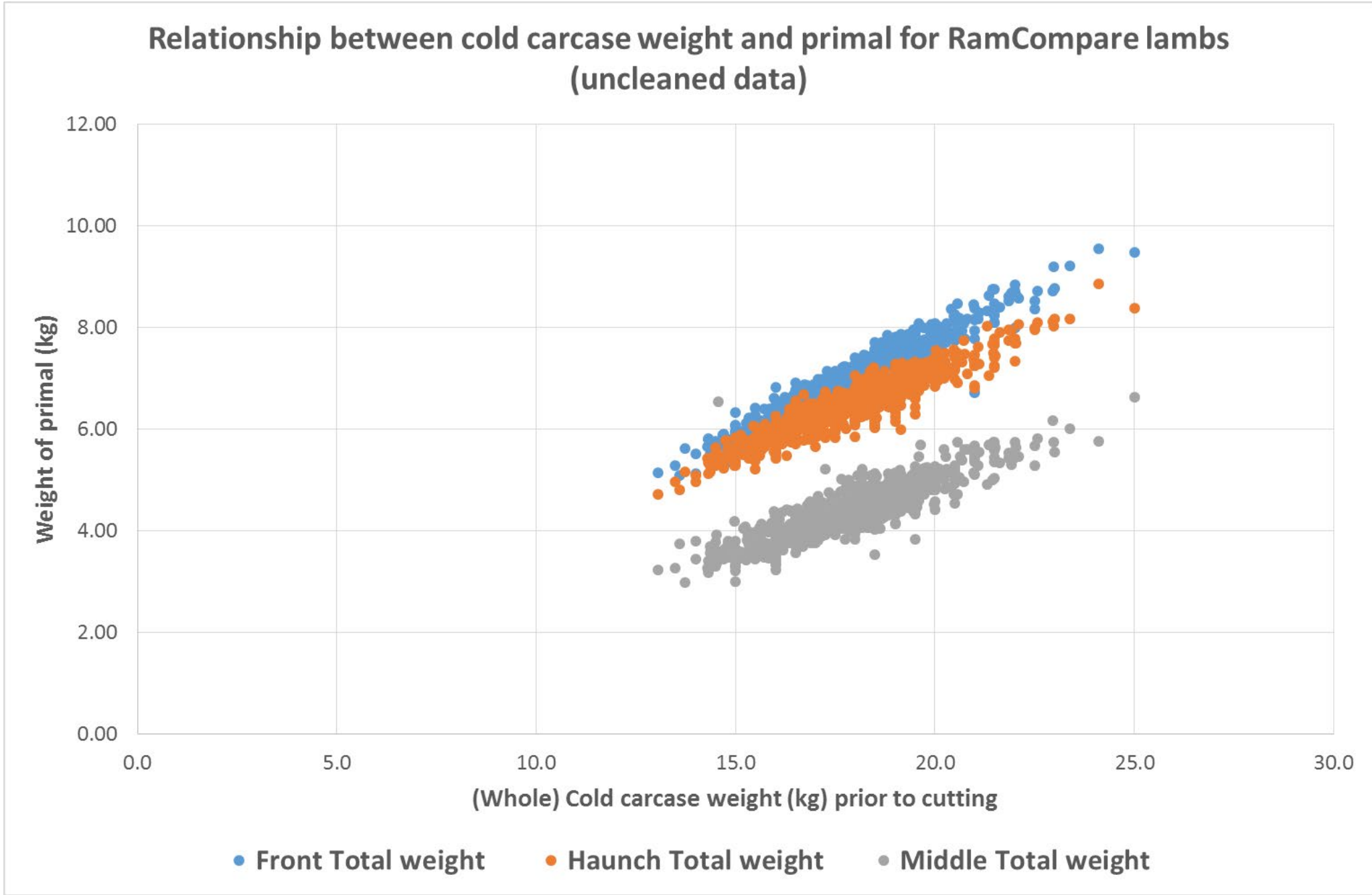
    - Information will have value in true economic indexes

Primals - What do we get?

WHOLE CARCASE WEIGHT	FRONT BONE INC NECK STUMP
FRONT TOTAL WEIGHT	BREAST AND BREAST FLAP COMBINED
FRONT SHOULDER	ABBATOIR NAME
FRONT NECK	WBSF SHEAR FORCE TEST
NECK STUMP (EX ATLAS BONE) RANDALL PARKER ONLY	DAYS BETWEEN KILL AND BONING DATES (FOR SHEAR FORCE)
FRONT BREAST FLAP/TIP RANDALL PARKER ONLY	Carcase Number
FRONT OTHER TRIM	Carcase Kill Number
FRONT FAT	Kidneys
FRONT BONE RANDALL PARKER ONLY	Boneless Loin
HAUNCH TOTAL WEIGHT	Pencil Fillet
HAUNCH LEGS	Saddle Bones
HAUNCH CHUMP	Cap On Eye of Loin
HAUNCH OTHER TRIM	Cap Trim
HAUNCH FAT	Cap Fat
HAUNCH BONE	Fat depth Best End
MIDDLE TOTAL WEIGHT	Fat Depth Mid Loin
MIDDLE RIB IN LOIN (CHUMP END)	Fat Depth Chump End
MIDDLE BEST END (RIB IN LOIN)	Saddle length
BREAST RANDALL PARKER ONLY	Total saddles
MIDDLE BLADE TIP	MIDDLE OTHER TRIM
MIDDLE FAT	MIDDLE BONE WEIGHT

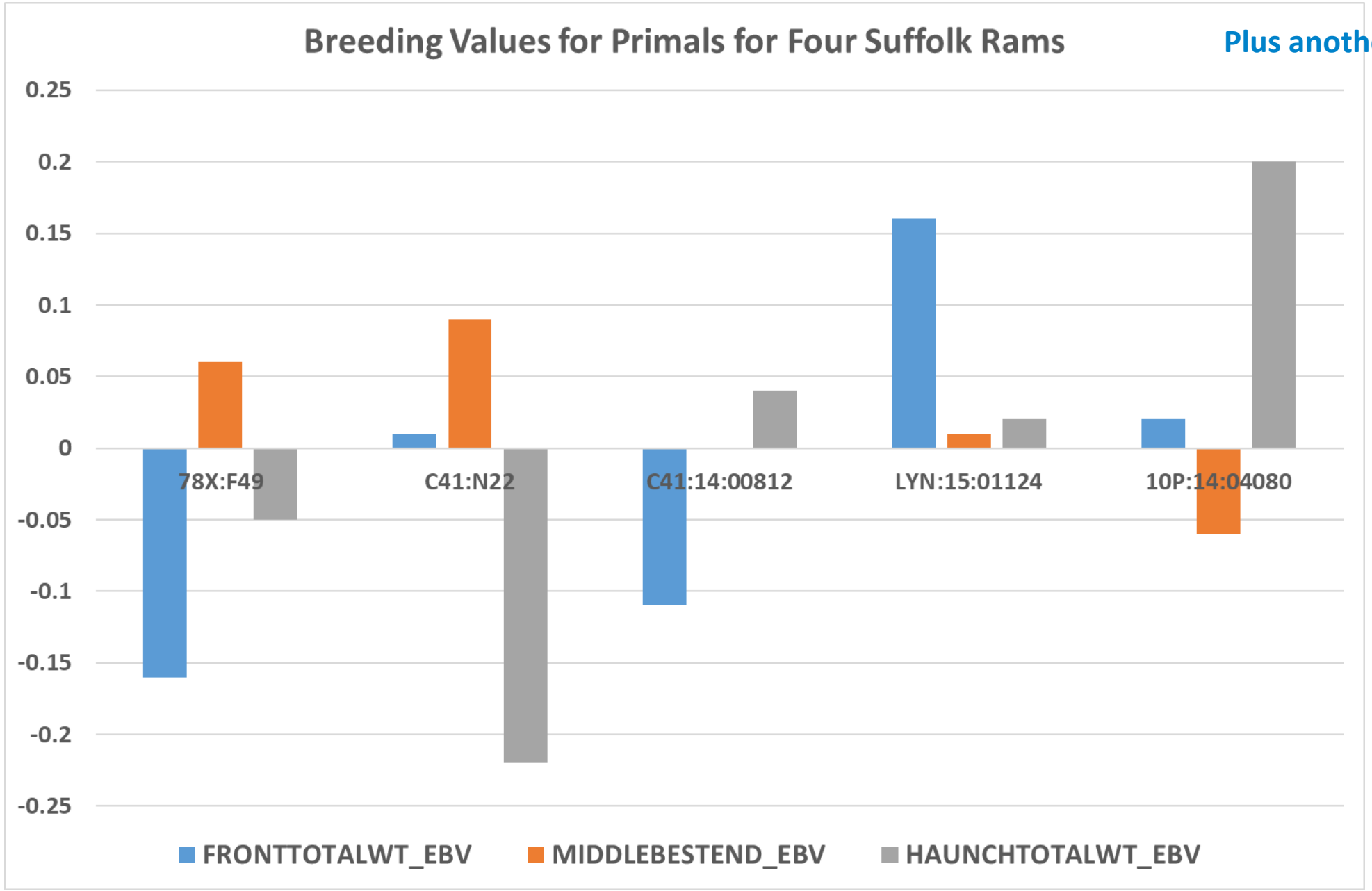


- **Haunch total weight** - Consisting of haunch leg, chump, haunch trim, haunch fat and haunch bones. (kg)
  - **Haunch legs** (kg)
- **Middle total weight** – Consisting of middle rib in loin, middle best end, breast, spinal cord, fat, kidneys and blade tips. (kg)
  - **Middle rib in loin** (kg)
  - **Middle best end** (kg)
- **Front total weight** – Consisting of raised shoulder, neck fillet, front paddiwack, front trim, front fat and front bones. (kg)


Relationship between cold carcase weight and primal for RamCompare lambs (uncleaned data)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Weight of primal (kg)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
(Whole) Cold carcase weight (kg) prior to cutting
Front Total weight
Haunch Total weight
Middle Total weight

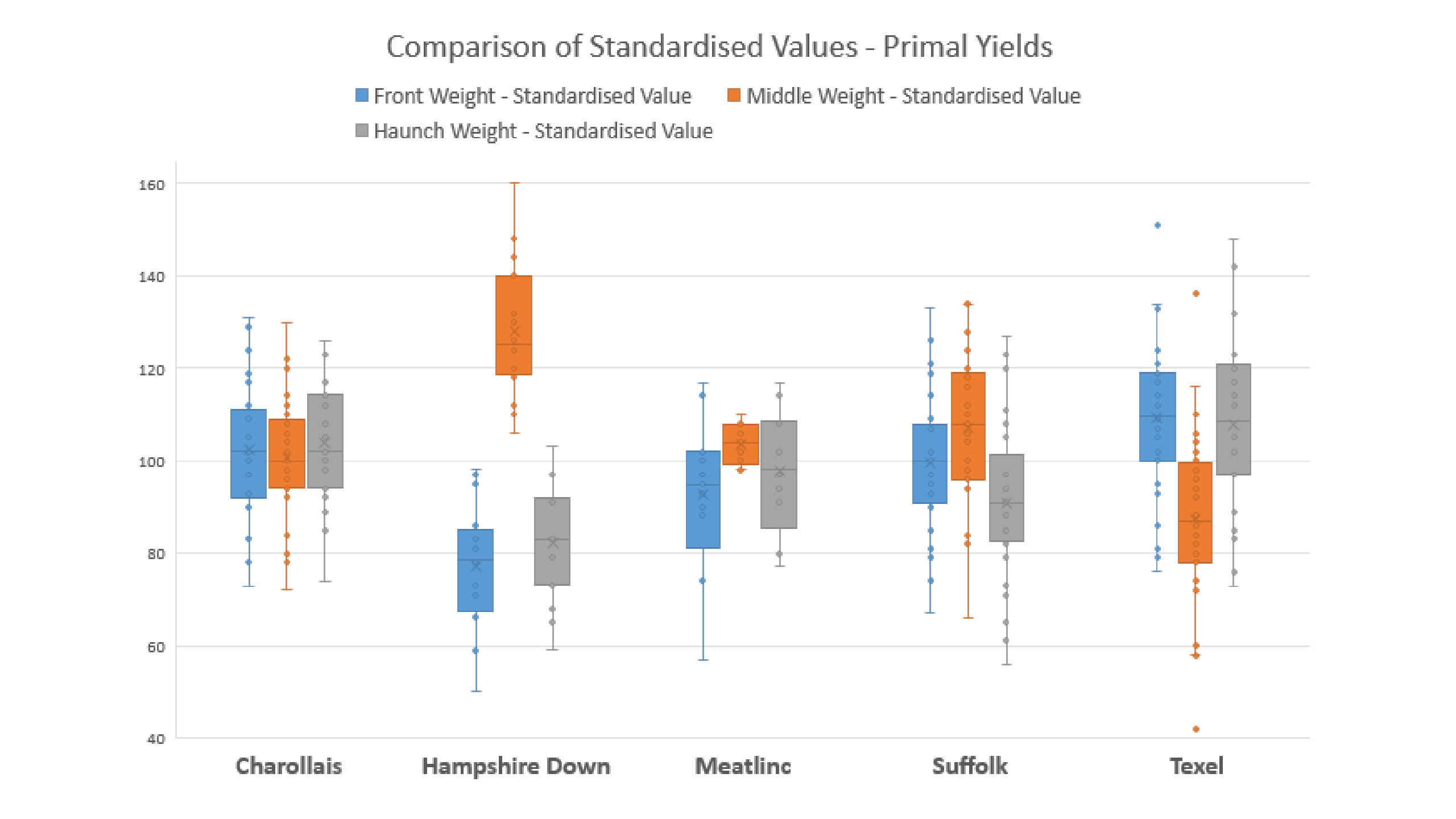
How is the trait defined?

- **Important** - these primal traits are weight adjusted, so they show the yield of a primal at a fixed carcase weight
  - Typically – as the yield in one area increases; the yield in another will fall – as the weight of the carcase is “fixed”
  - *You can’t have it all!*


Breeding Values for Primals for Four Suffolk Rams
Plus another one
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
78X:F49
C41:N22
C41:14:00812
LYN:15:01124
10P:14:04080
FRONTTOTALWT_EBV
MIDDLEBESTEND_EBV
HAUNCHTOTALWT_EBV

How heritable is the trait?

	Genetic Variance	*Total Variance*	Heritability
Carcase weight	*1.09*	*2.73*	**0.40**
Carcase fat class	*10.55*	*20.96*	**0.50**
Carcase conformation	*11.63*	*32.17*	**0.36**
Days to slaughter	*90.1*	*321.4*	**0.28**
Front total weight	*0.14*	*0.29*	**0.48**
Middle rib in	*0.007*	*0.02*	**0.35**
Middle best end	*0.004*	*0.011*	**0.36**
Middle total weight	*0.041*	*0.21*	**0.20**
Haunch weight	*0.024*	*0.046*	**0.52**
Shearforce	*0.12*	*0.69*	**0.17**


Comparison of Standardised Values - Primal Yields
Front Weight - Standardised Value
Middle Weight - Standardised Value
Haunch Weight - Standardised Value
160
140
120
100
80
60
40
Charollais
Hampshire Down
Meatlinc
Suffolk
Texel

Next steps

- Complete data collection for the 2020 lamb crop, taking number of samples to ~3000
- Write up results in published journal
  - Review correlations with other traits
- Assess cost benefit of changing carcase balance, when looking at trait on a weight adjusted basis
  - Vs cost of sample collection (10/15 lambs @ £10/£30 sample = £100*/450 per ram)
- *(DNA banked for potential genomic future)*