

# Does selection for lean meat yield reduce the sensory scores of Australian lamb?

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# Outline

- The consumer matters
- Selection for Lean Meat Yield (LMY)
- How LMY affects consumer eating quality

# Importance of Eating quality

- Drives repurchase intent and willingness to pay
- It's a key driver of demand of lamb

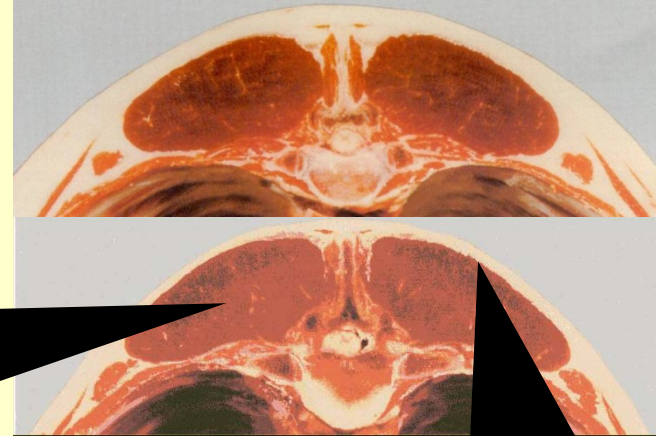
# Importance of Eating quality

- Drives repurchase intent and willingness to pay
- It's a strong key driver of demand of lamb

**Currently no way to select for it in lamb**

# Selection for lean meat yield

## ■ Lean Meat Yield

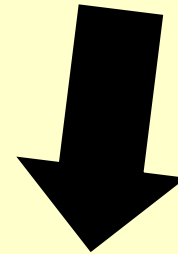
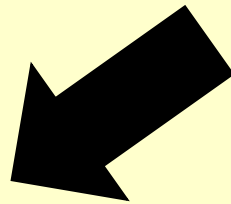
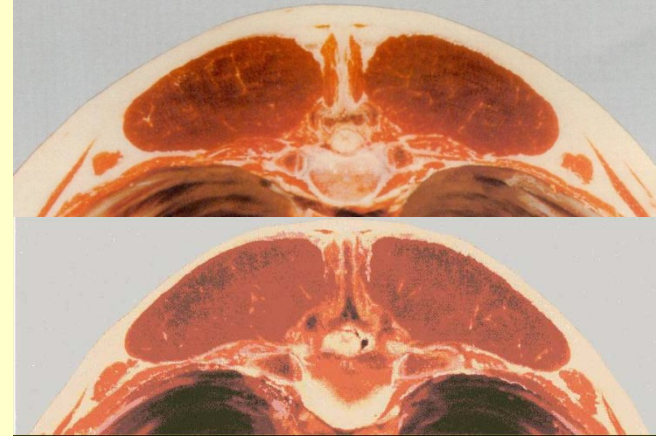


**Muscling  
+PEMD**

**Leanness  
-PFAT**

# Selection for lean meat yield

## ■ Lean Meat Yield

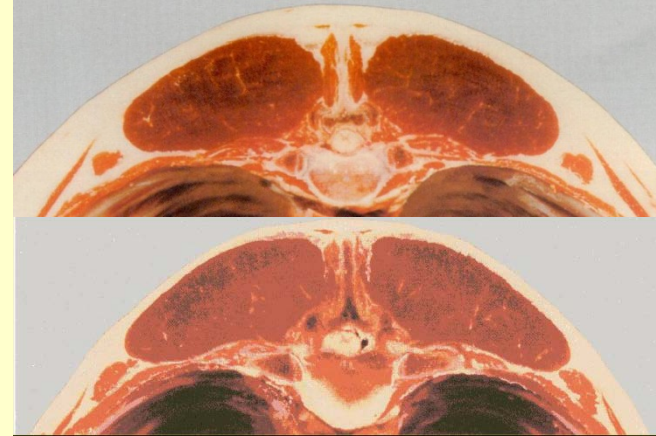


Shear Force

# Challenges – Future focus

## Balance 2 key consumer traits

### ■ Lean Meat Yield



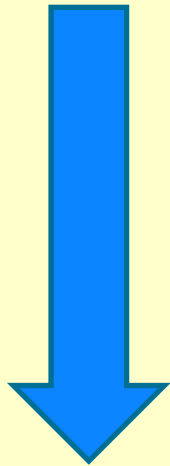
### ■ Eating quality

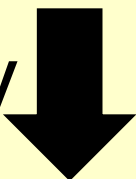


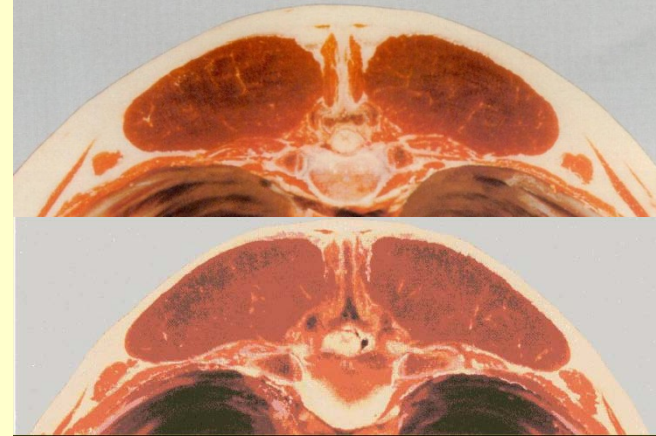
Tenderness  
Juiciness  
Flavour  
Overall Liking

# Hypothesis

- Lean Meat Yield



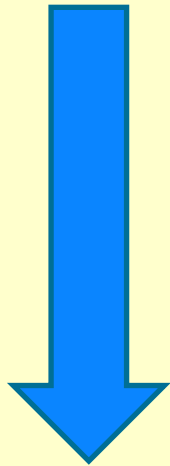
- Eating quality 



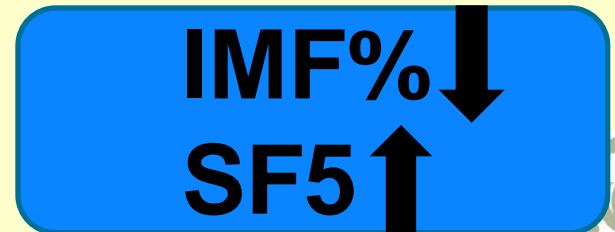
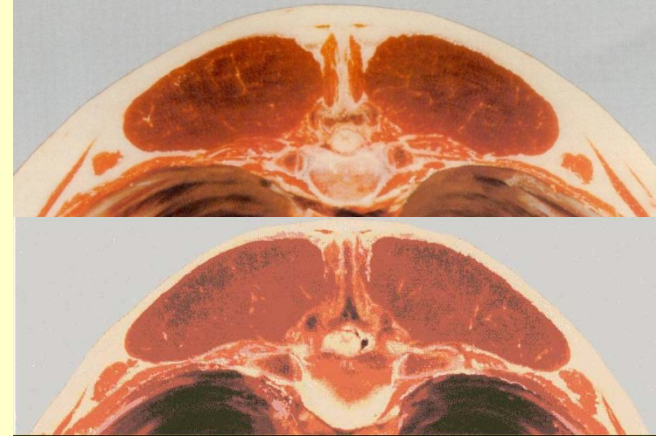
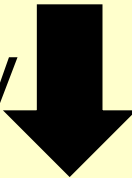


# Hypothesis

■ Lean Meat Yield



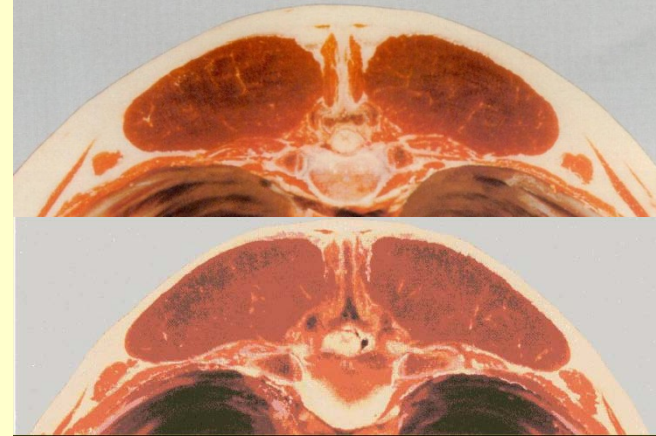
■ Eating quality



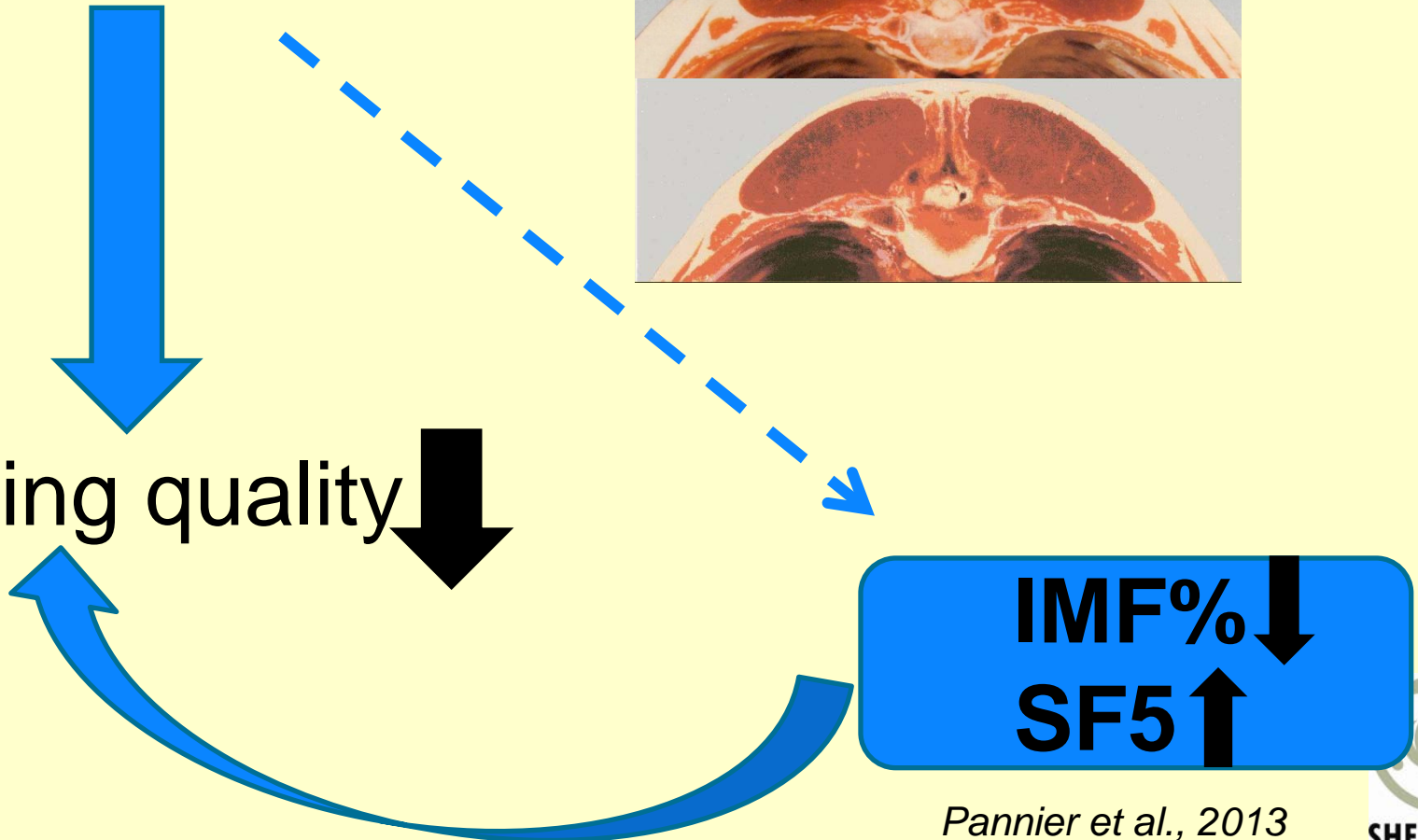
*Pannier et al., 2013*

# Hypothesis

■ Lean Meat Yield



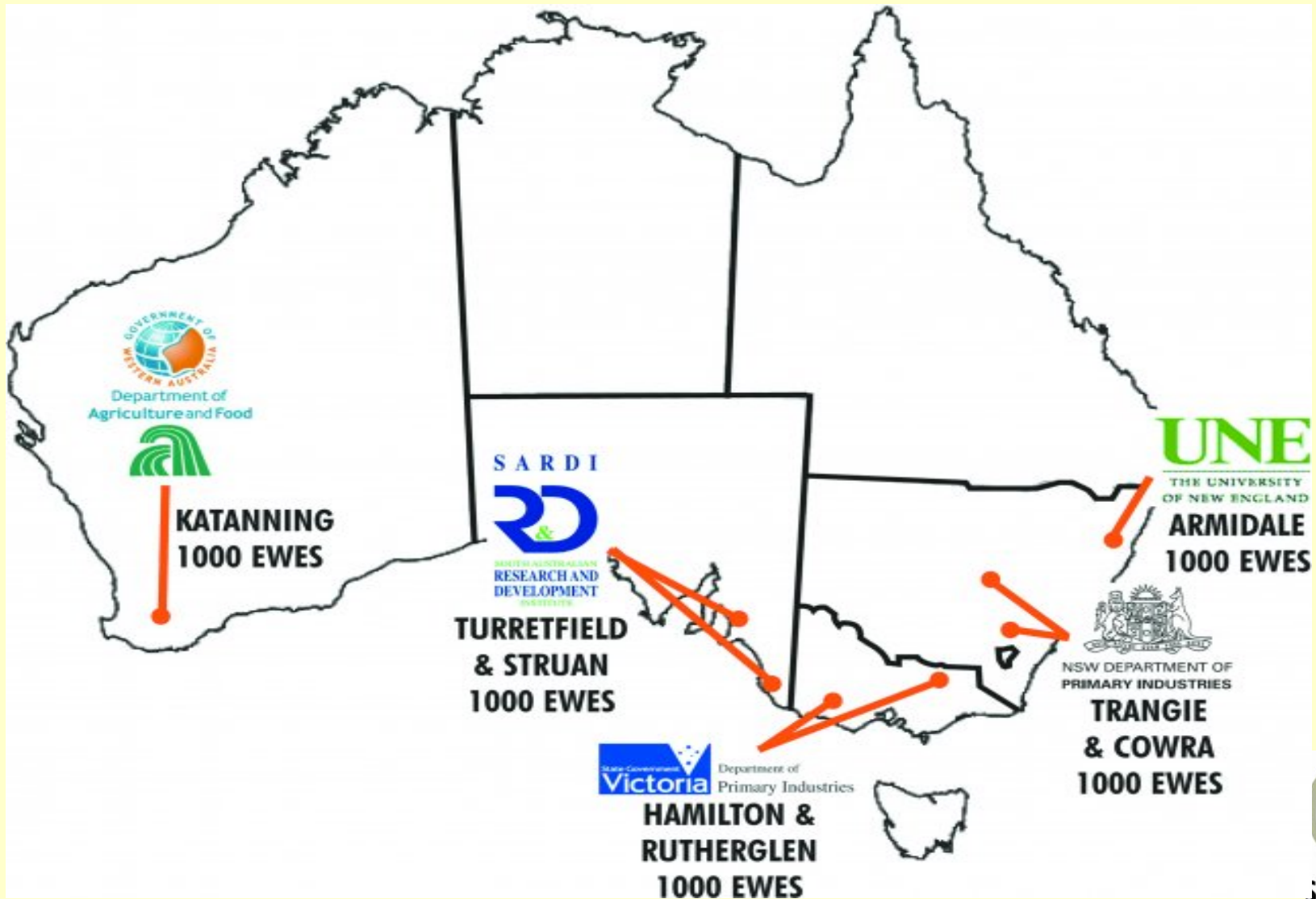
■ Eating quality



# Information Nucleus Flock

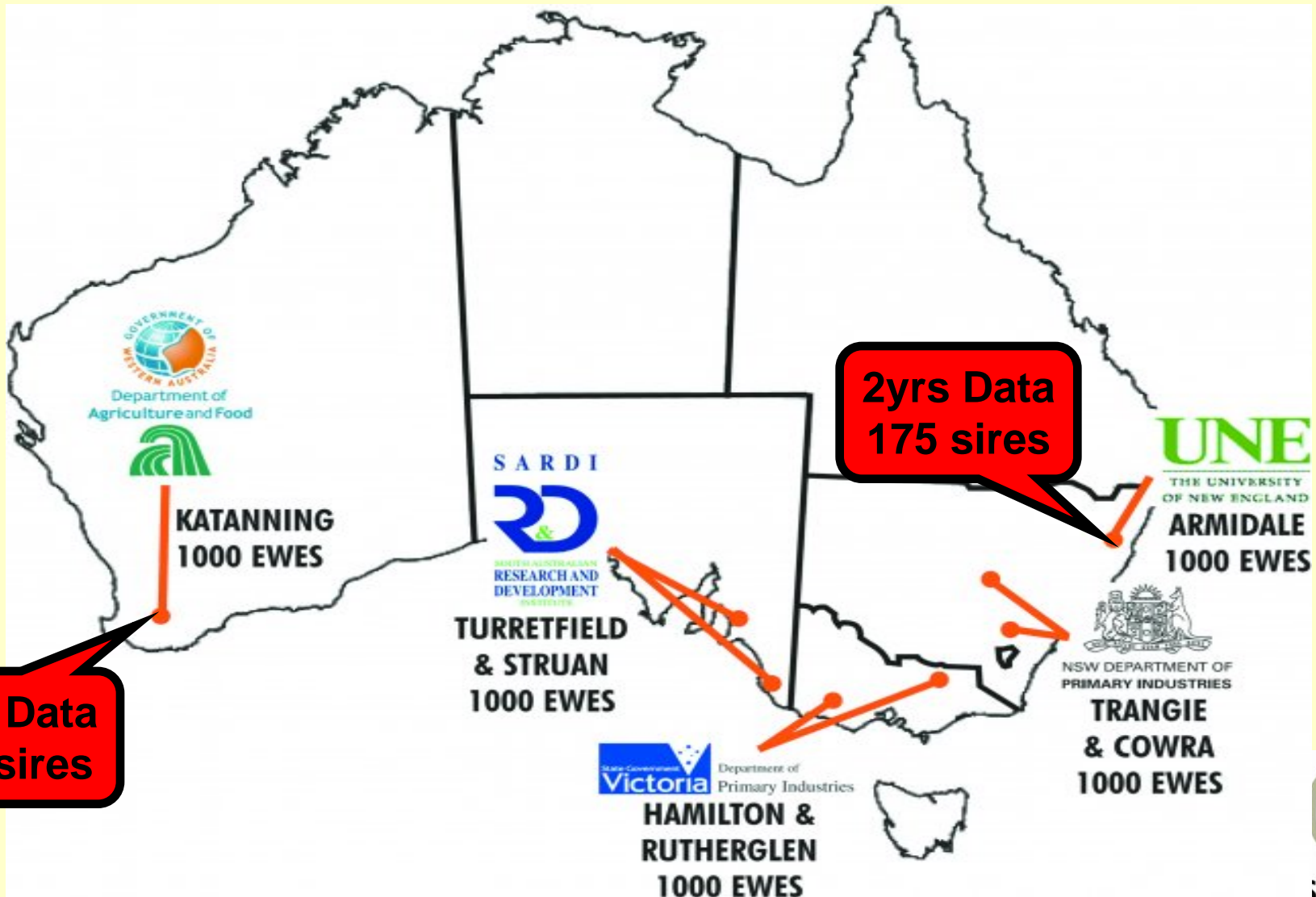
# Design

8 production sites & ~100 sires per year



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8 production sites & ~100 sires per year



# Consumer testing (n = 1471)

- Loin and Topside
- Tenderness (0 – 100)
- Juiciness
- Liking of flavour
- Odour
- Overall liking



# Consumer testing

■ Unsatisfactory

■ Better than every day

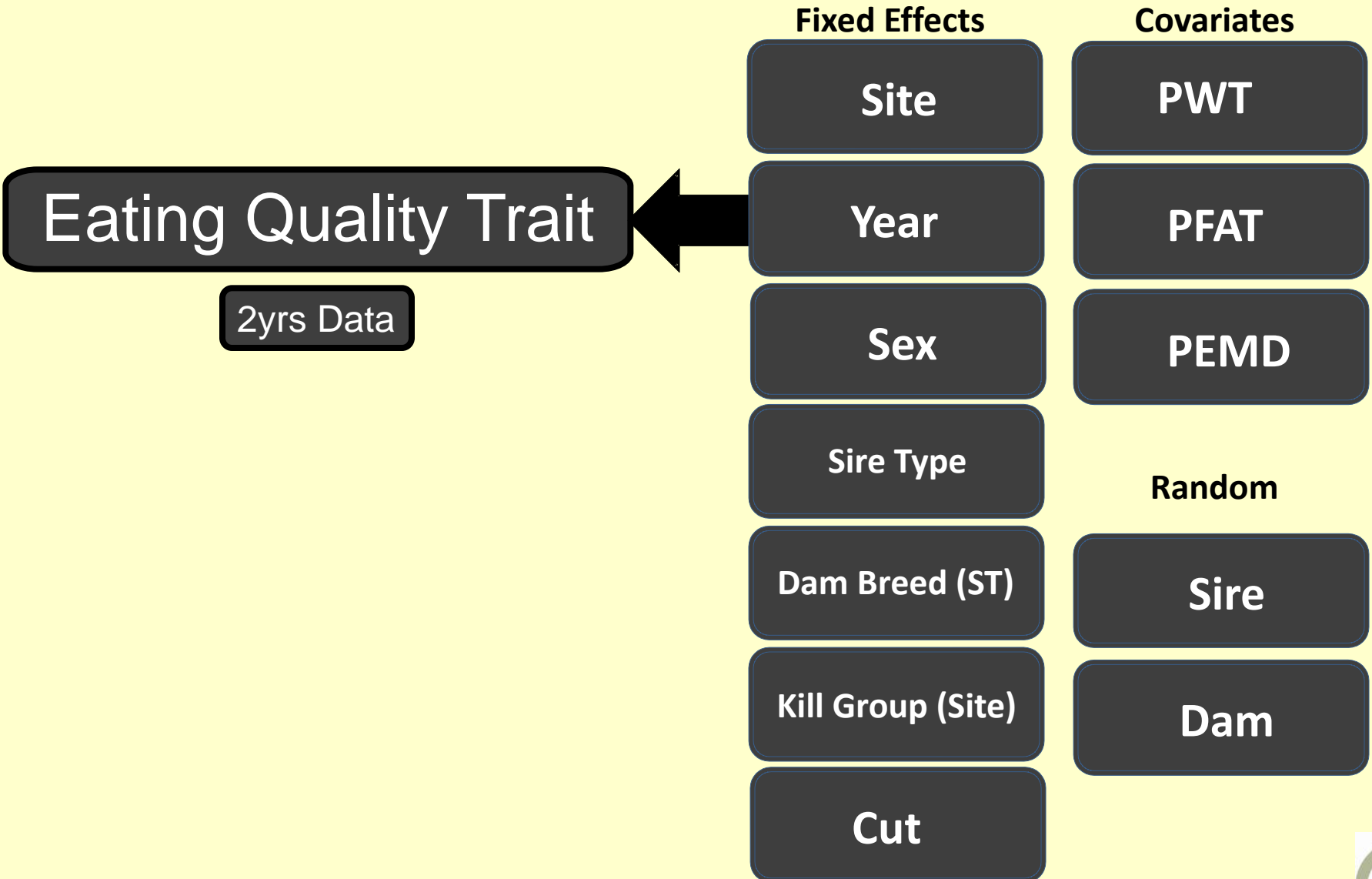
■ Good every day

■ Premium



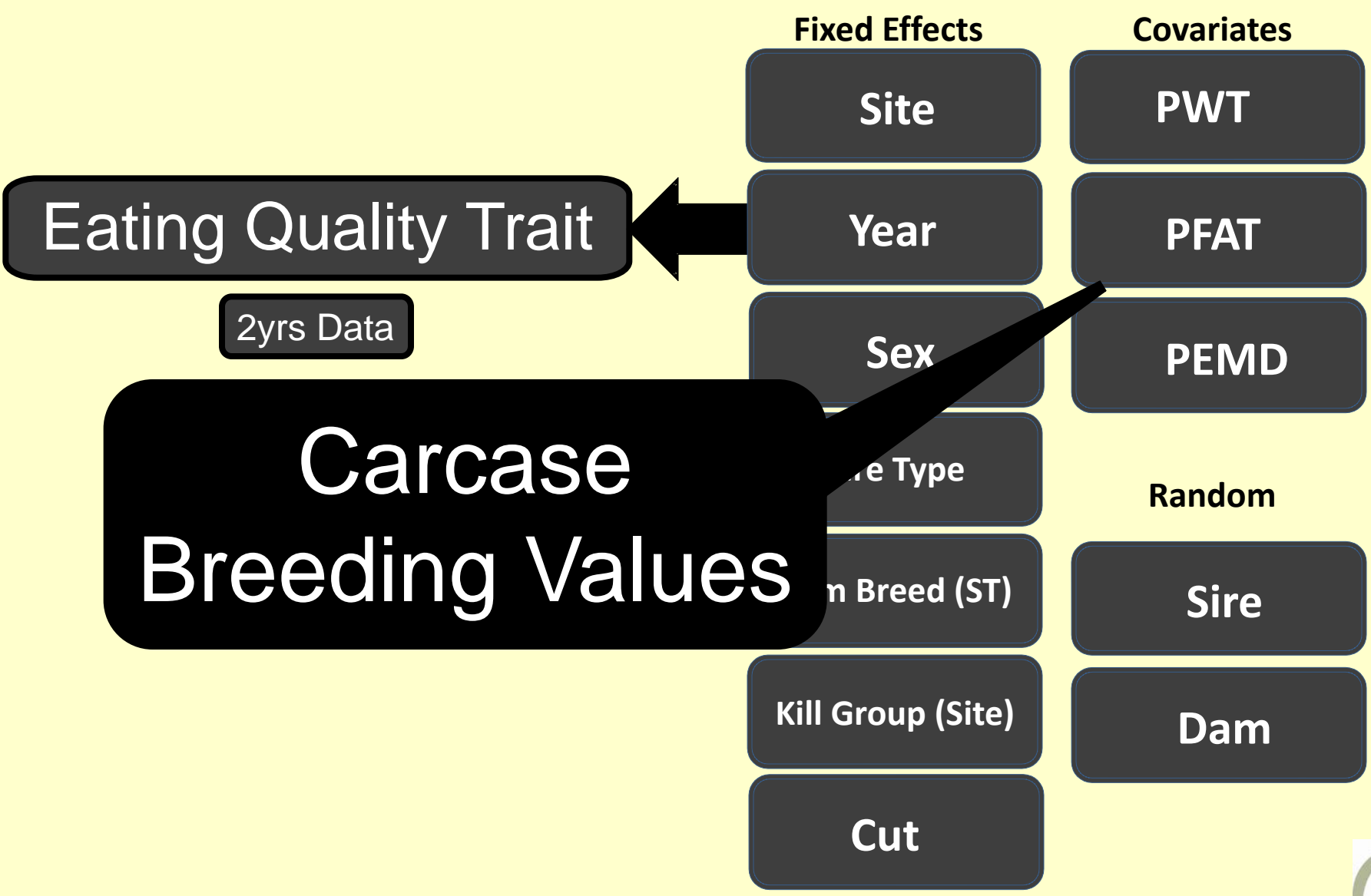
**Real people (n = 5640) – real answers!**

# Statistical Analysis

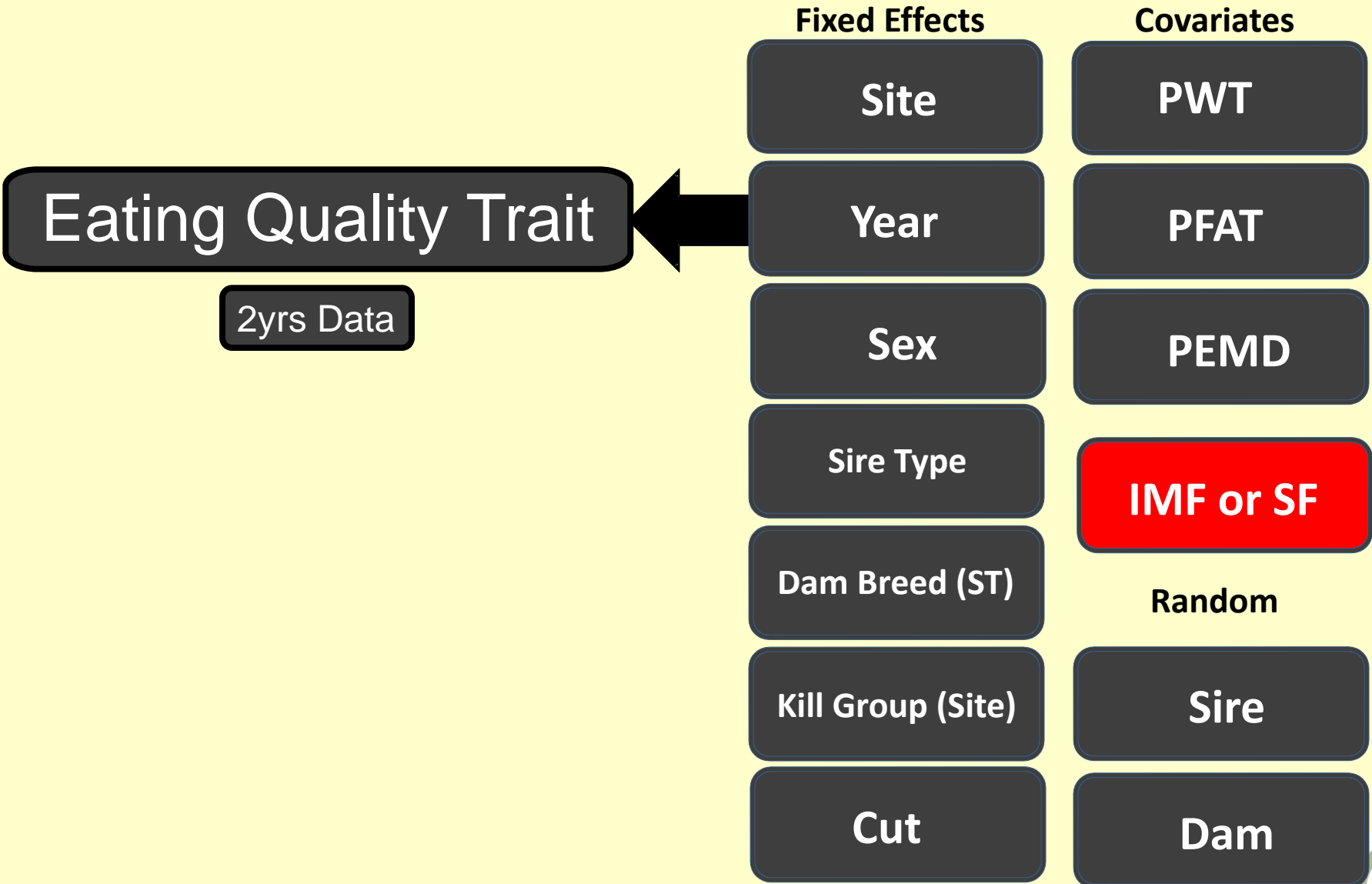




# Statistical Analysis



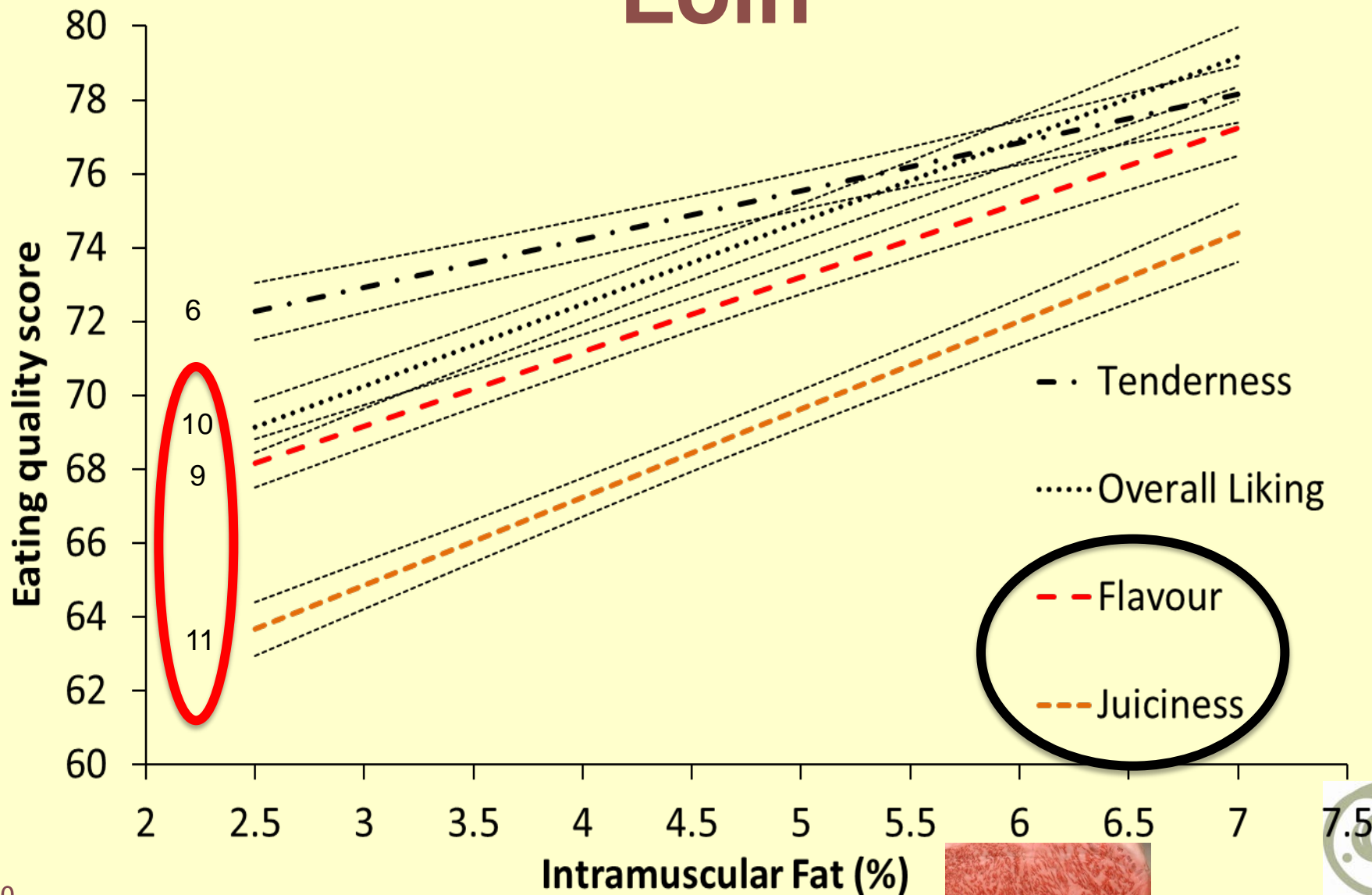
# Statistical Analysis



# Phenotypic associations

# IMF% increases EQ score

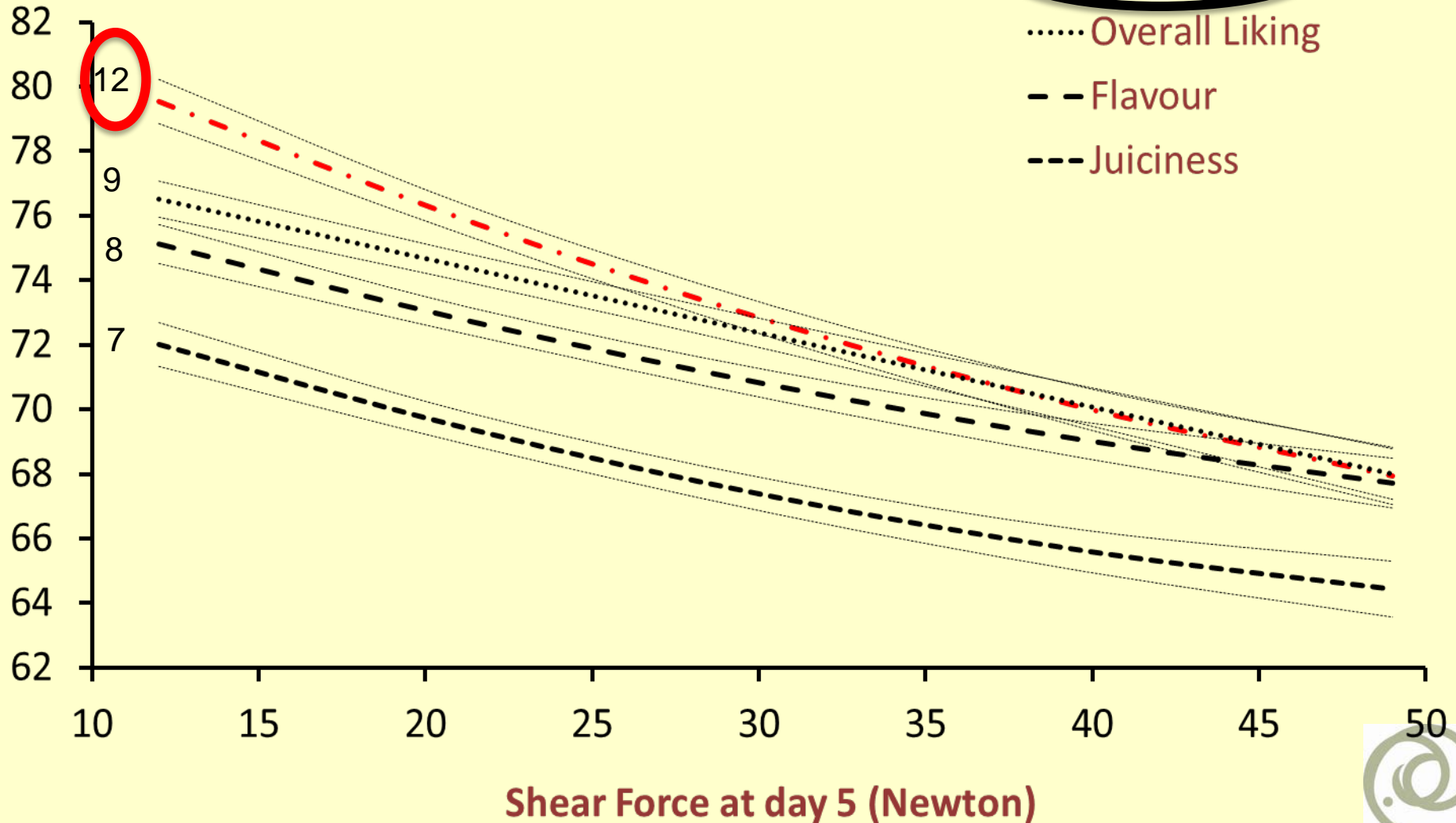
## Loin



# SF5 decreases EQ score

## Loin

Eating quality score



Tenderness

Overall Liking

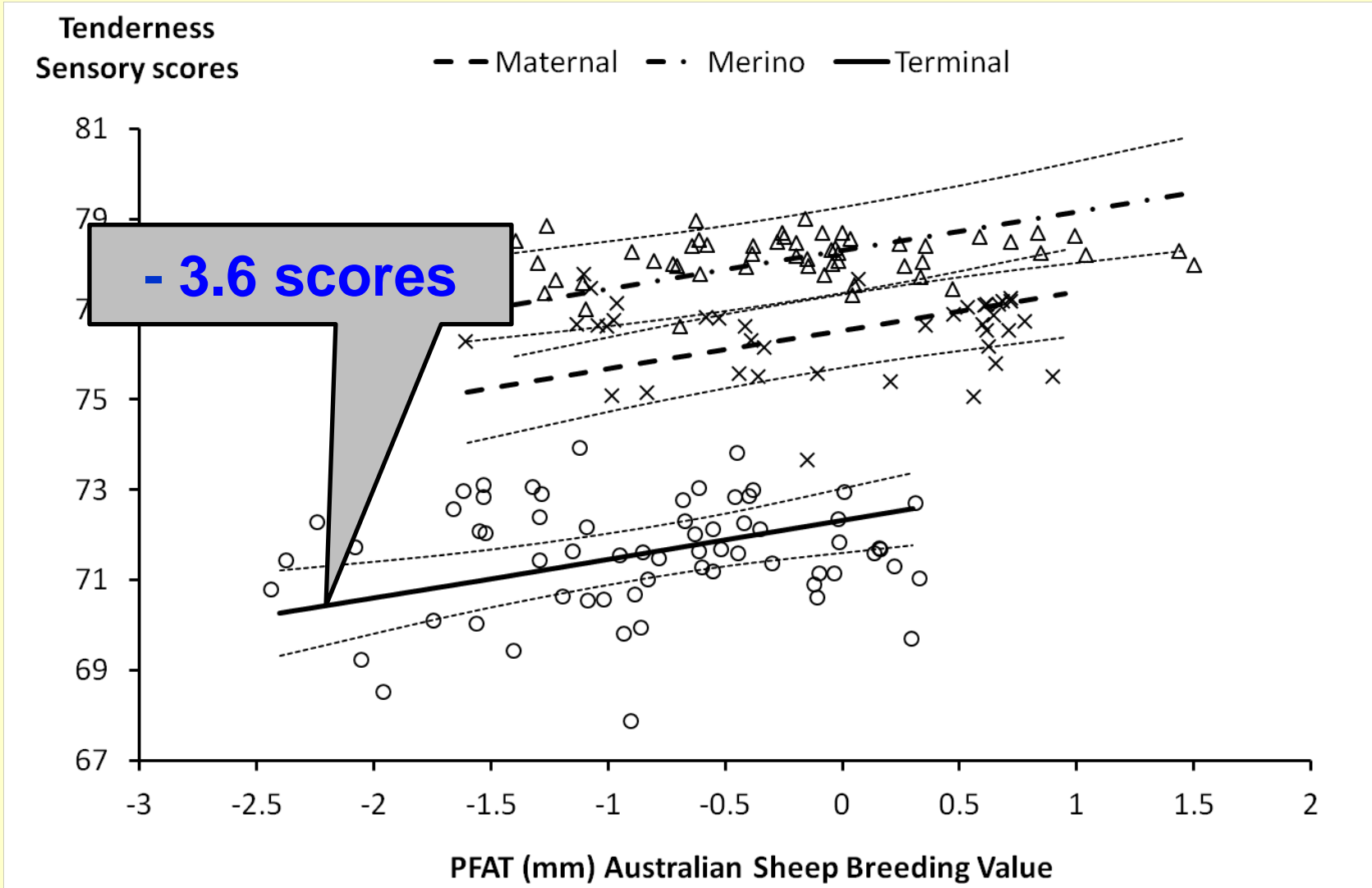
Flavour

Juiciness

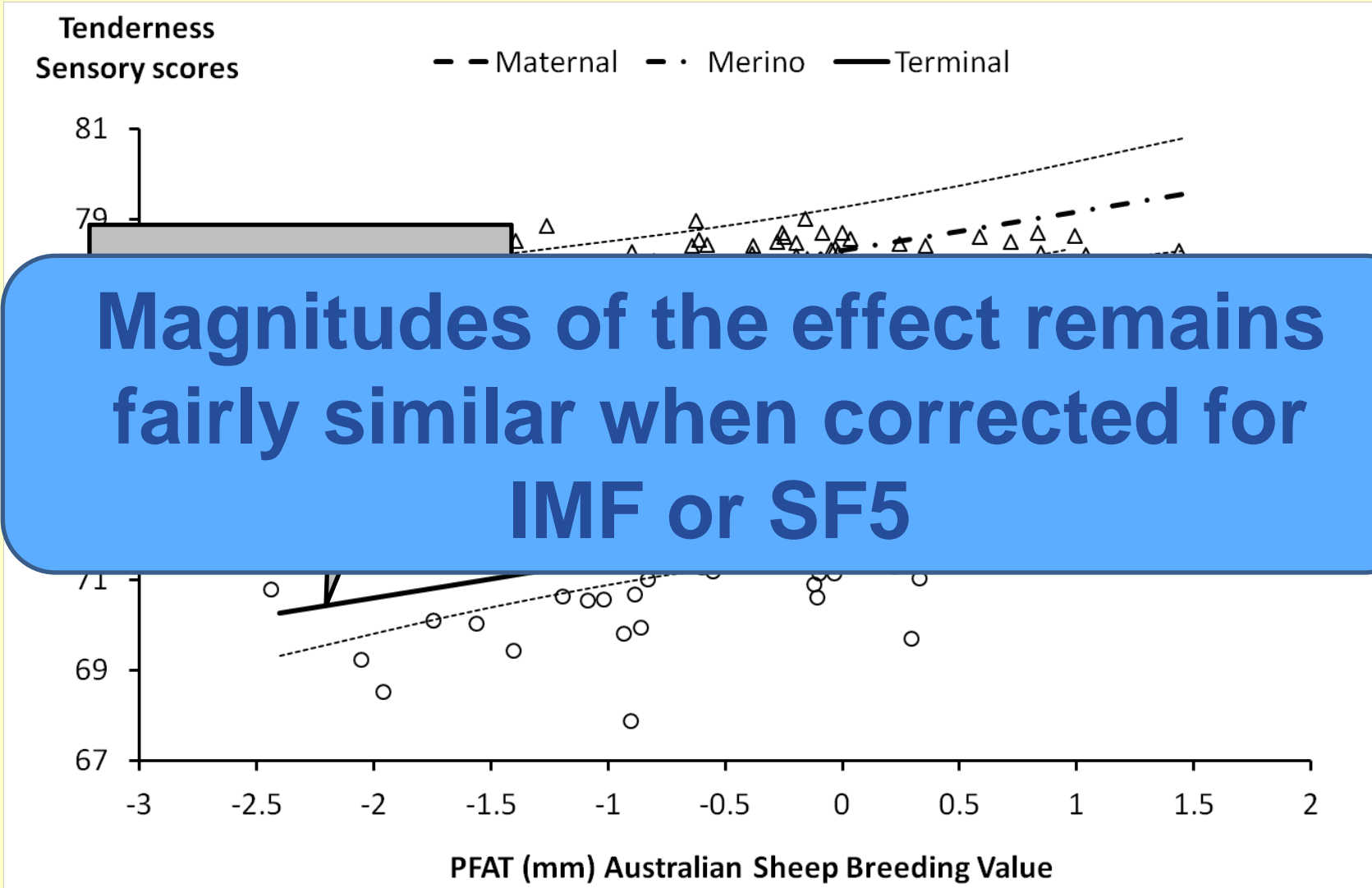
# Selection for lean meat yield

# PFAT

# Selection for PFAT reduces tenderness – Loin only



# Selection for PFAT reduces tenderness – Loin only

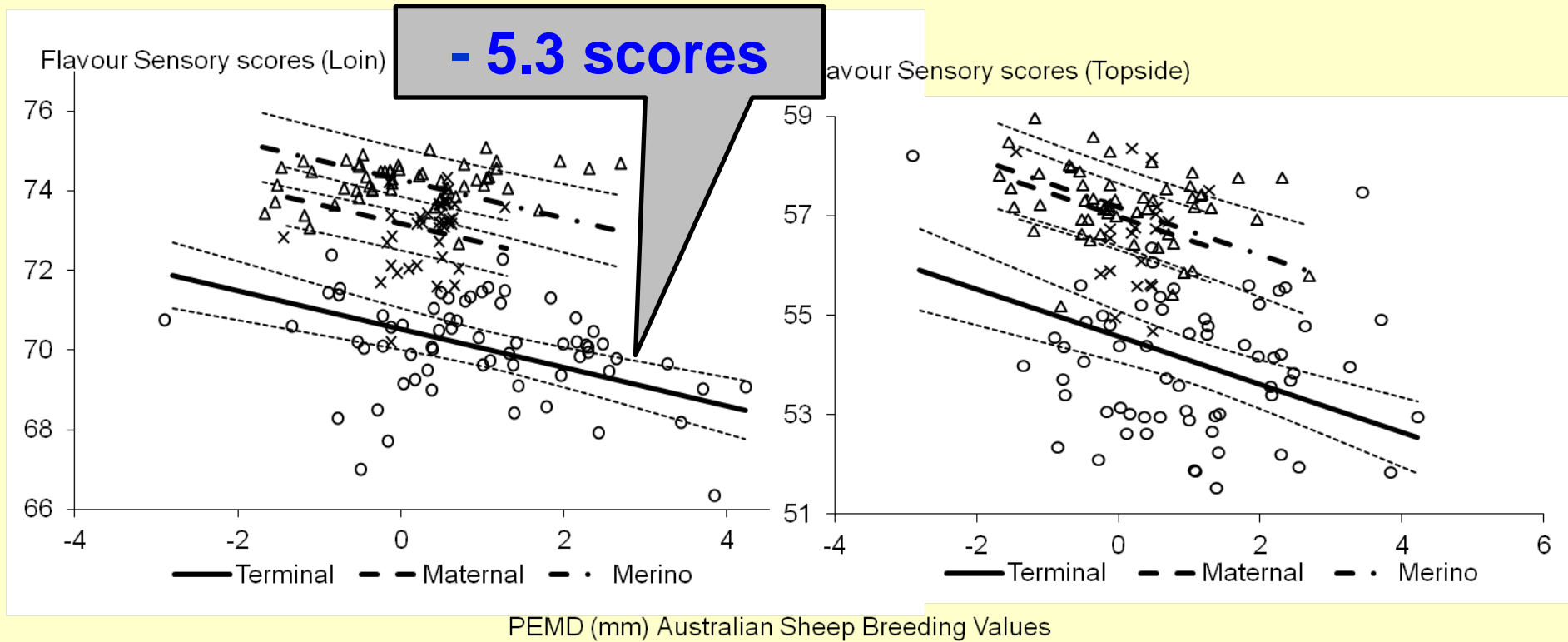




# Selection for lean meat yield

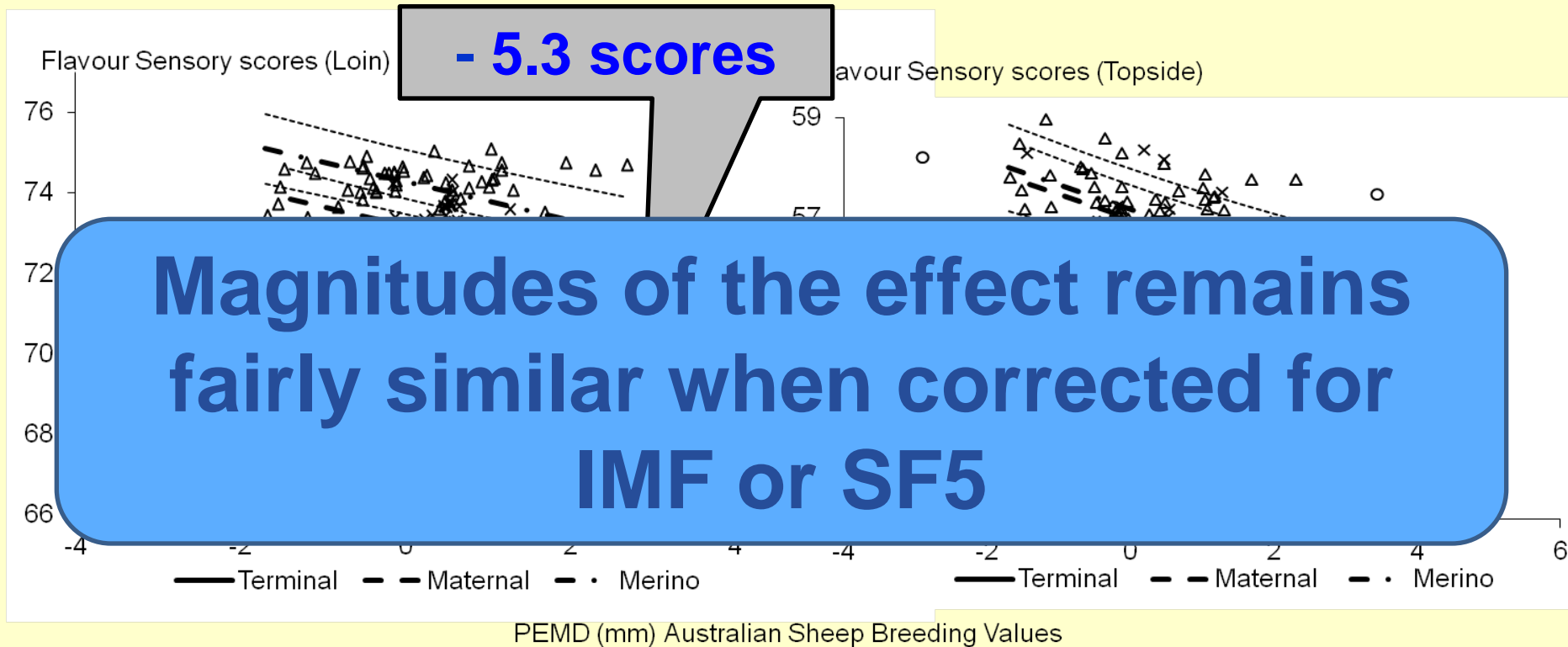
# PEMD

# Selection for PEMD reduces tenderness, Ov.liking, flavour



Overall liking: -3.6  
Flavour: -3.1

# Selection for PEMD reduces tenderness, Ov.liking, flavour

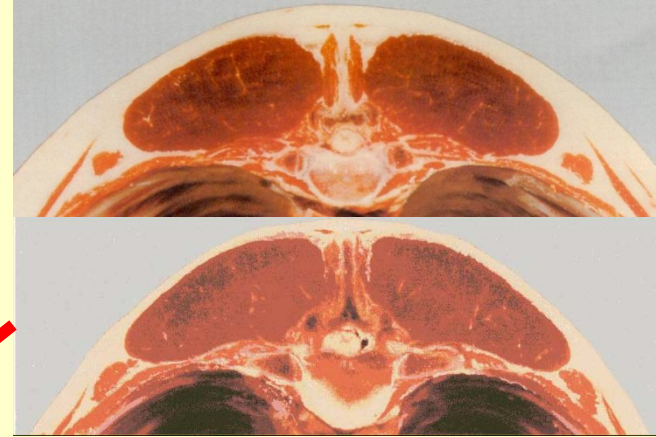


Overall liking: -3.6

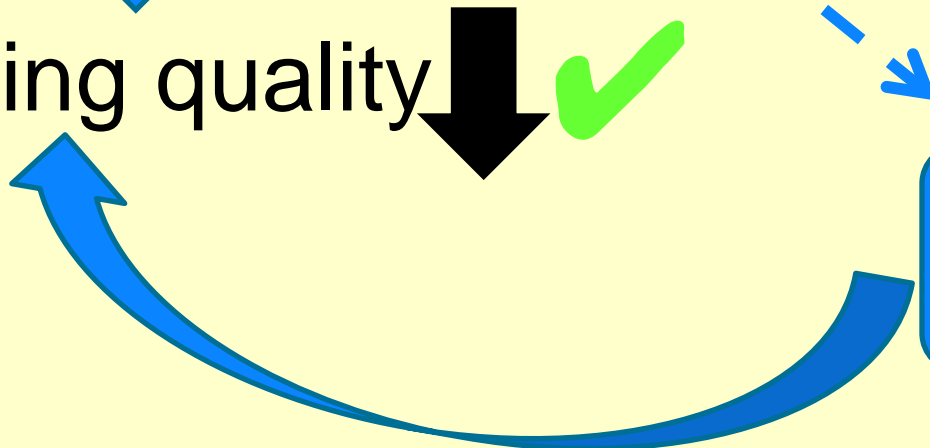
Flavour: -3.1

# Hypothesis

## ■ Lean Meat Yield



## ■ Eating quality



**IMF% ↓**  
**SF5 ↑**

*Pannier et al., 2013*

# Selection for lean meat yield

=

**less juicy, less flavour &  
less tender**

# Selection for lean meat yield

**LMY is important**

**...**

**But we need to protect  
eating quality**

# Summary

- Relationship with IMF and EQ is linear
- Carefully monitor future selection for LMY
- Continuous selection for LMY will **reduce EQ (via PFAT, PEMD)**

**Slow down further selection?**

# Summary

## Manage yield and eating quality

- Maintain selection pressure on LMY
- **Develop a EQ Breeding Value ( $h^2 = 0.3$ )**
  - Based on IMF, Shear Force
  - On-going consumer testing of sire progeny





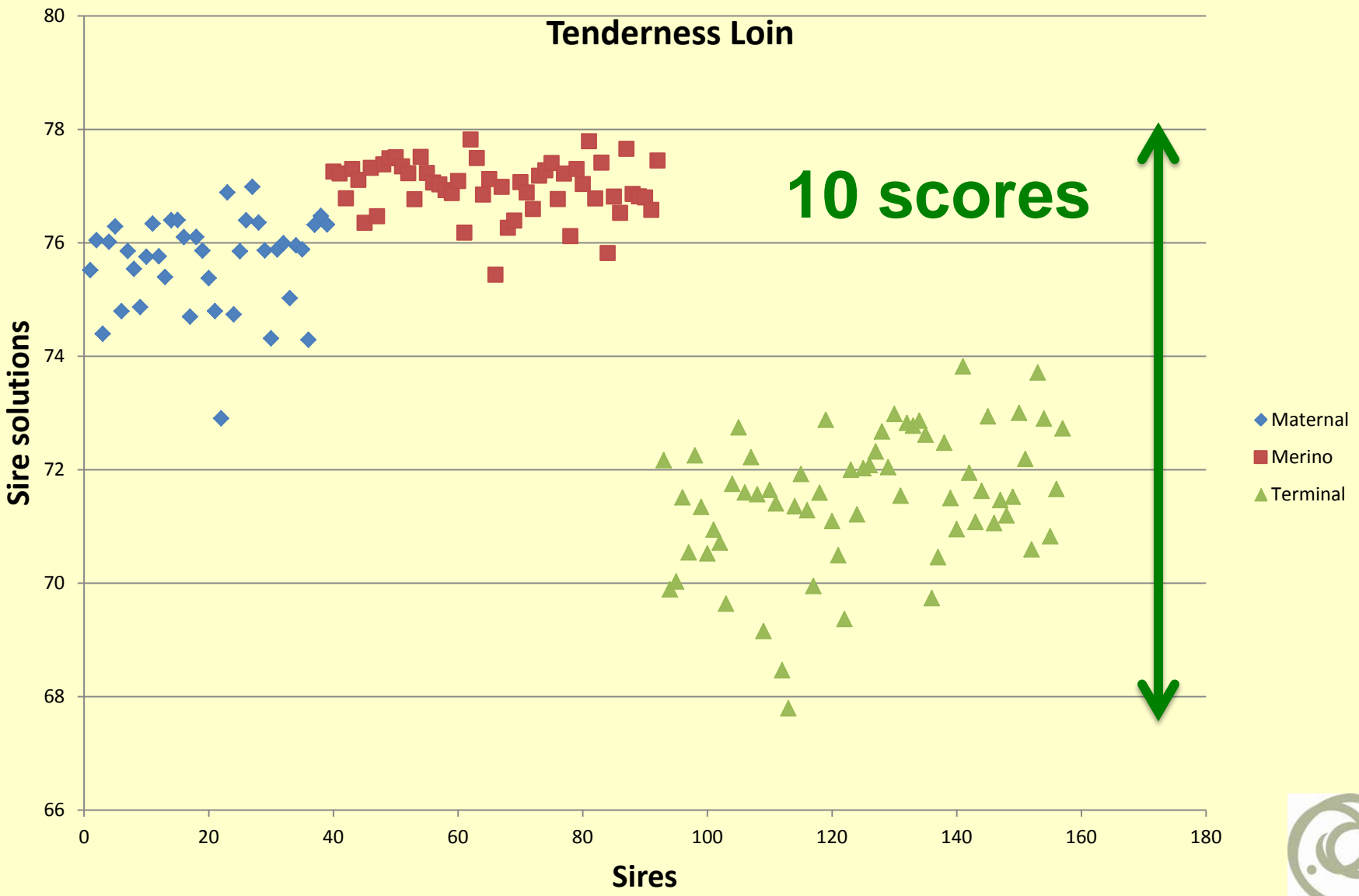
# Summary

## Manage yield and eating quality

- Keep **monitoring EQ** to assess direction of breeding programs
- **Develop a predicted EQ score** based on relationship with IMF, SF5
  - ⇒ **Up to 11 scores**
  - ⇒ **Good predictor** of sensory scores

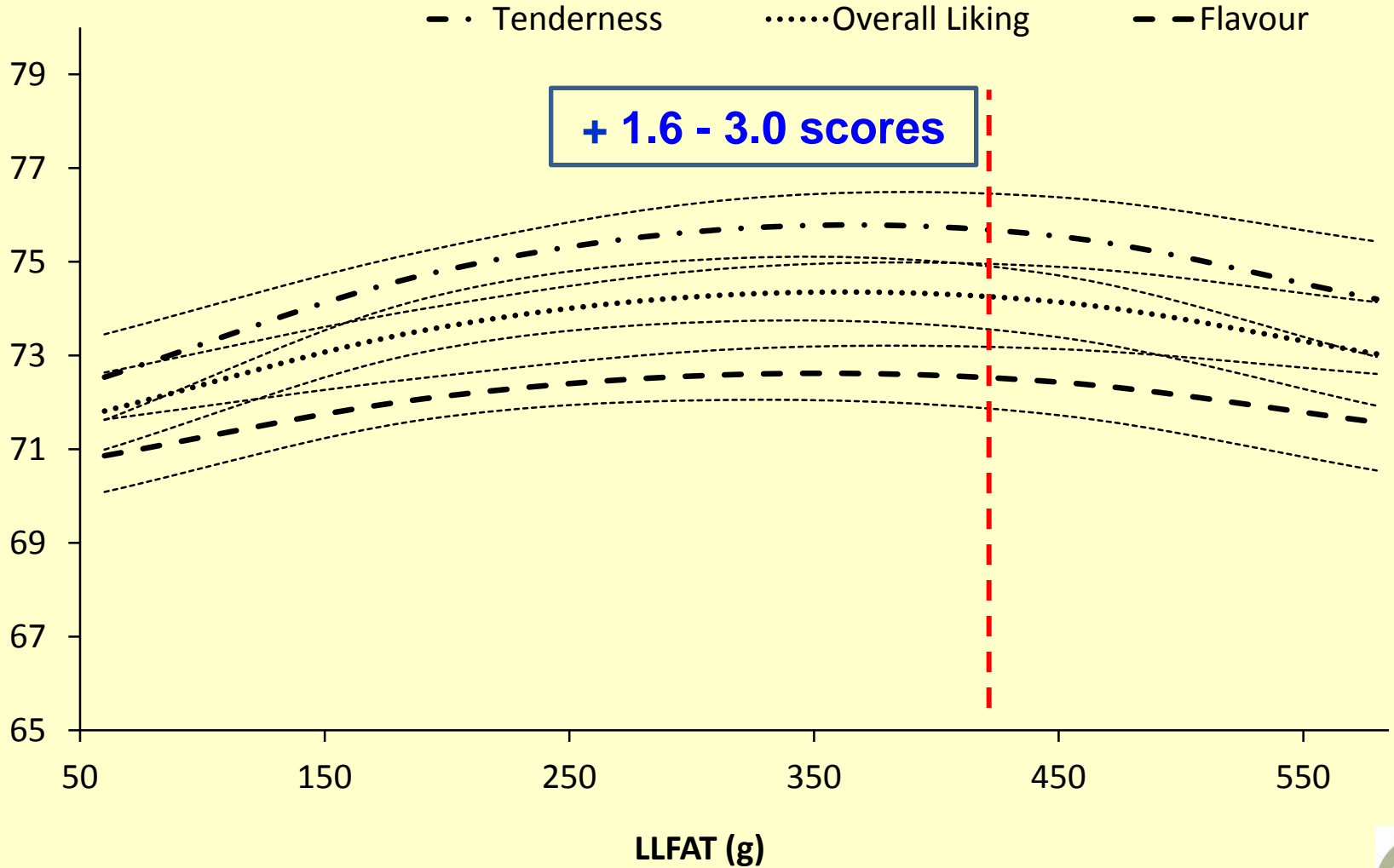
# Sire variation

Tenderness Loin

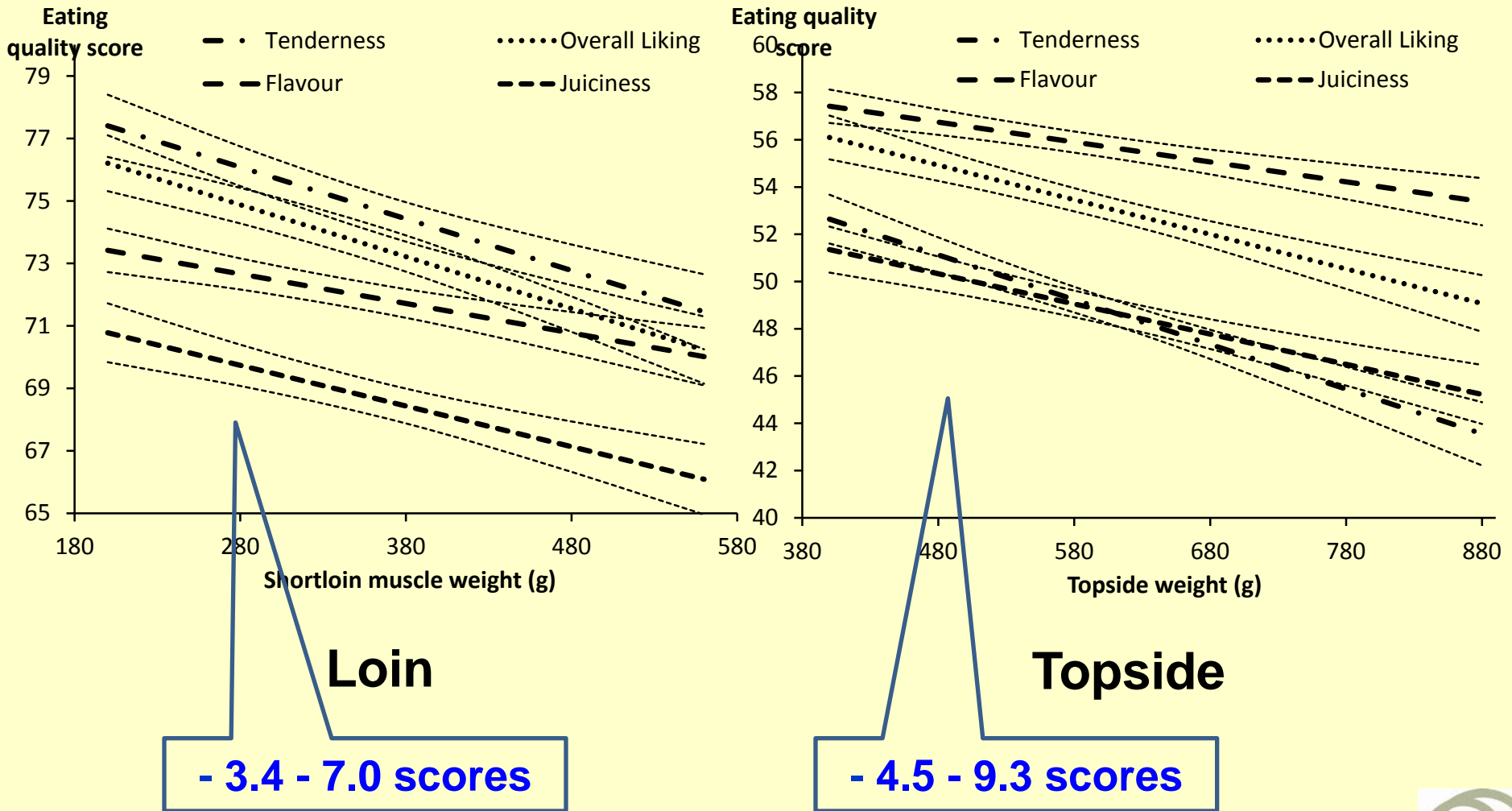


# Fatness increases EQ

Eating quality score

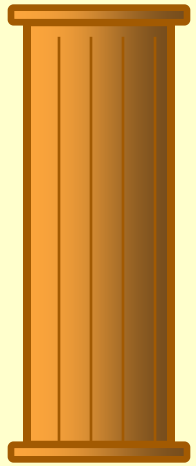


# Muscling decreases EQ

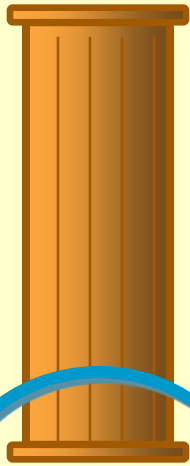


# Importance

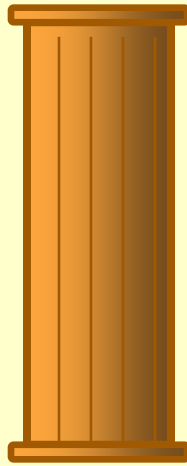
5 pillars of consumer demand



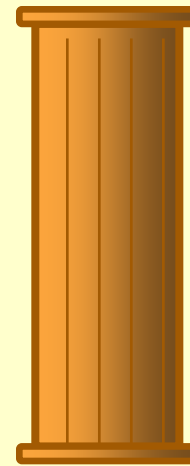
Integrity &  
Traceability



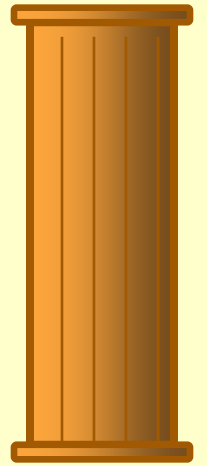
Eating Quality



Nutritional  
value



Ethical systems



Value &  
efficiency