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## For the latest in red meat R&D

# Objective measurement informing feedback to improve productivity

Richard Apps

Meat & Livestock Australia

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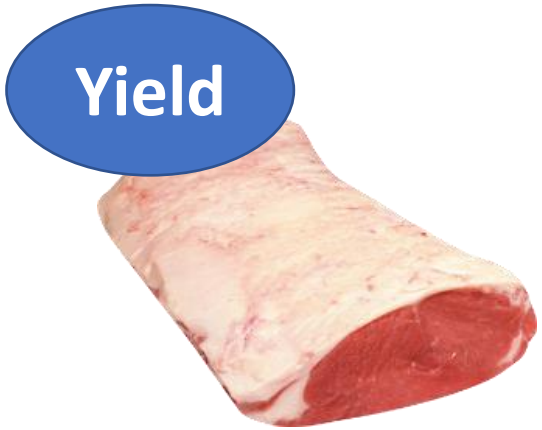
# True value of the carcase


Carcase value

=




**kg**

Weight of retail cuts

X

**$ / kg**

Value of the cuts

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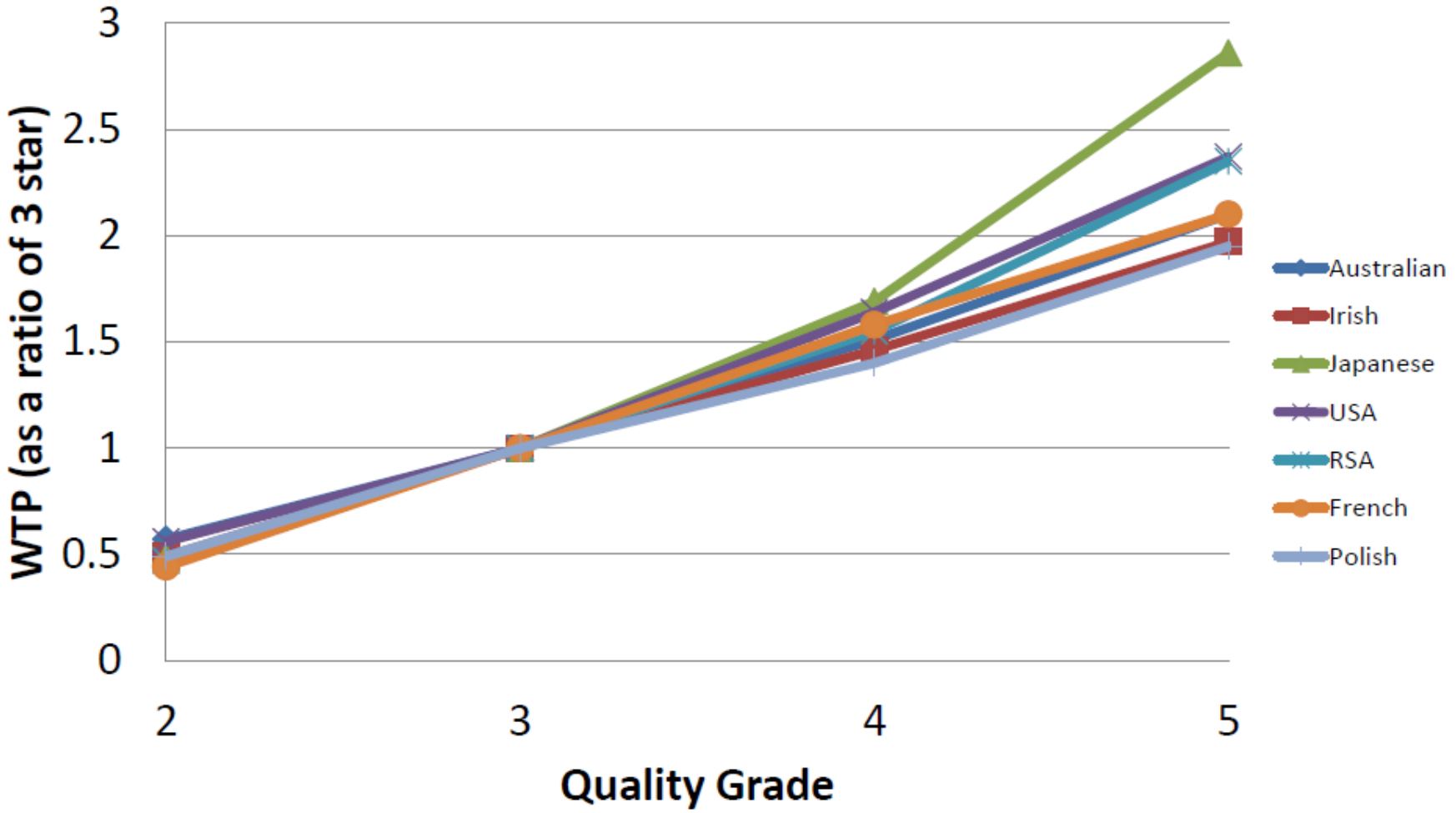
# Consumer Willingness to Pay

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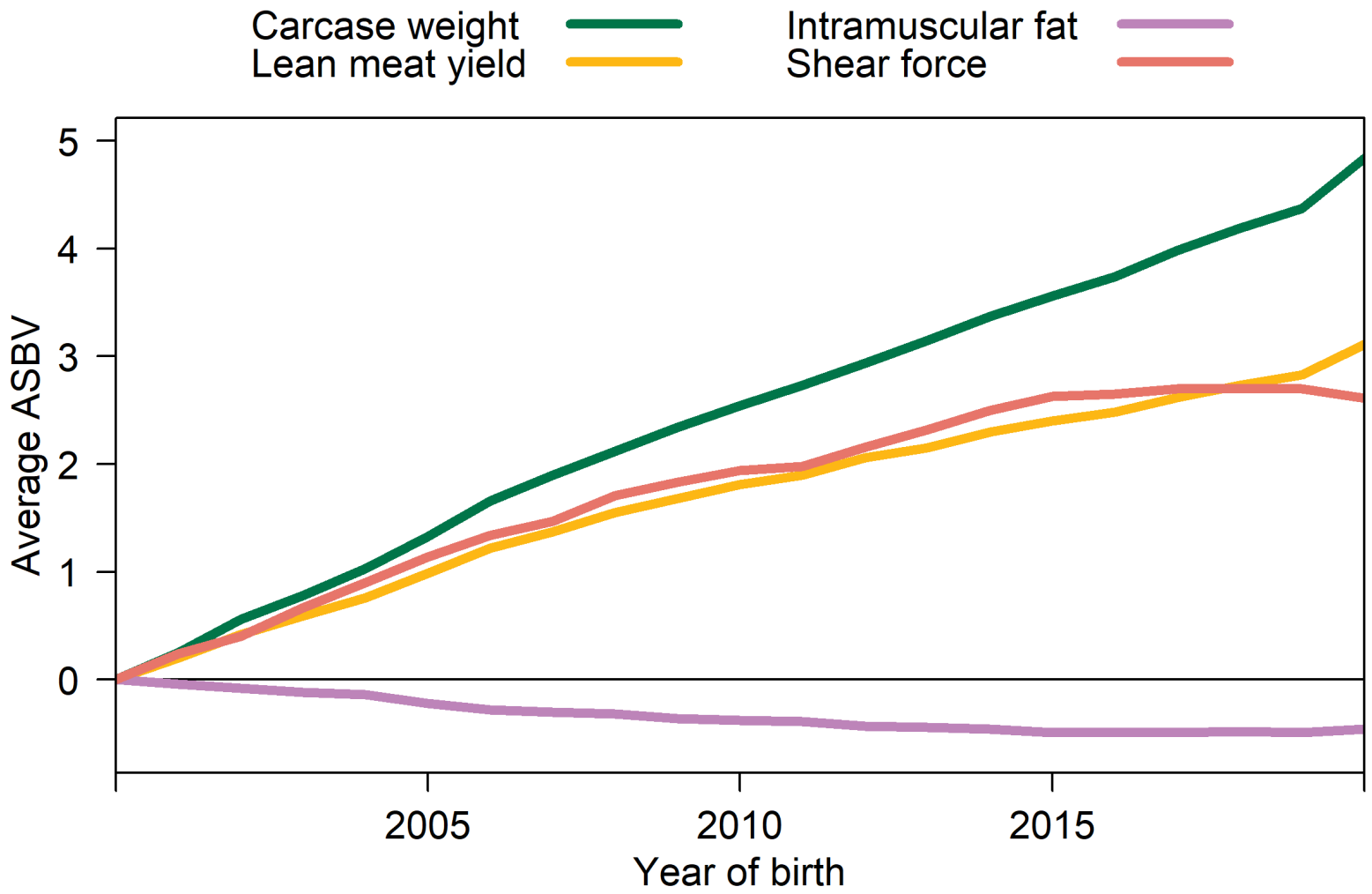
# Willingness to pay x eating quality

O'Reilly, Pannier et al 2016

| | Fail | Pass (3*) | Credit (4*) | Distinction (5*) |
|---|---|---|---|---|
| **USA** | 46% | 100% | 150% | 209% |
| **China** | 57% | 100% | 147% | 212% |
| **Aus** | 53% | 100% | 141% | 189% |

Grilled lamb

# Productivity improving but eating quality declining

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# Technologies Under Investigation

## Eating quality

Rib eye cameras
- E+V
- Frontmatec
- Meat Image Japan
- Cedar Creek
- Master Beef
- LEAP automation

Near infrared (NIR)

Raman Spectroscopy

Insertion probes - Multi-spectral & OCT

Nuclear Magnetic Resonance

Computed Tomography (+live)

## Yield / composition

X-ray - Computed Tomography (CT)
- SEXA
- DEXA
- MEXA

Equine CT ( + live)

Airline CT

3D surface imaging (+ live)

E+V whole-body camera (+ rib-eye)

Microwave (+ live)

BCC3

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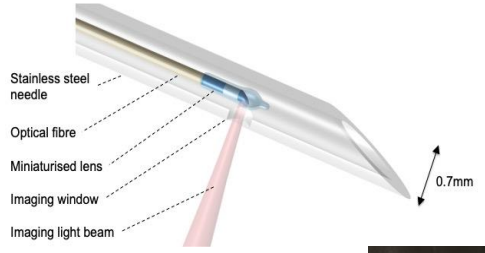
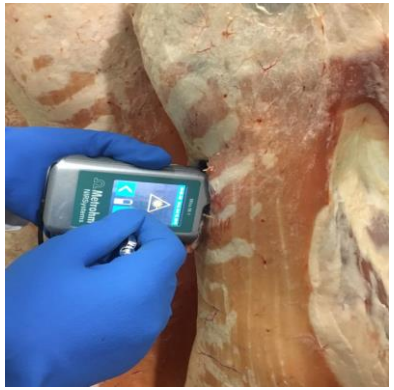
# Technologies under development



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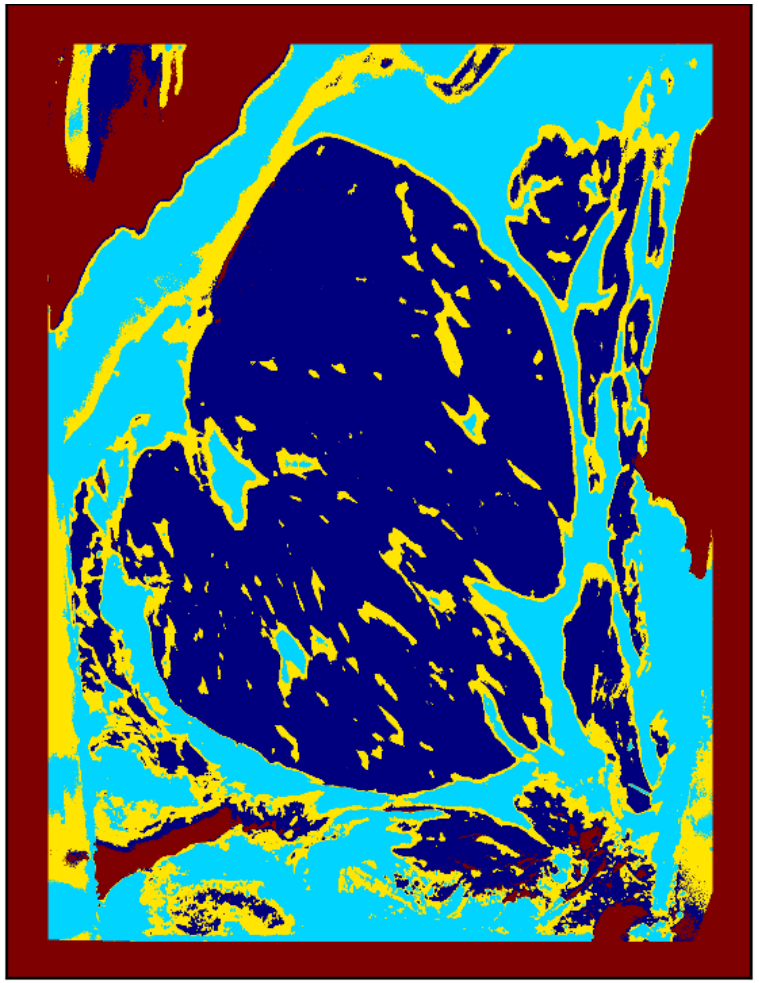
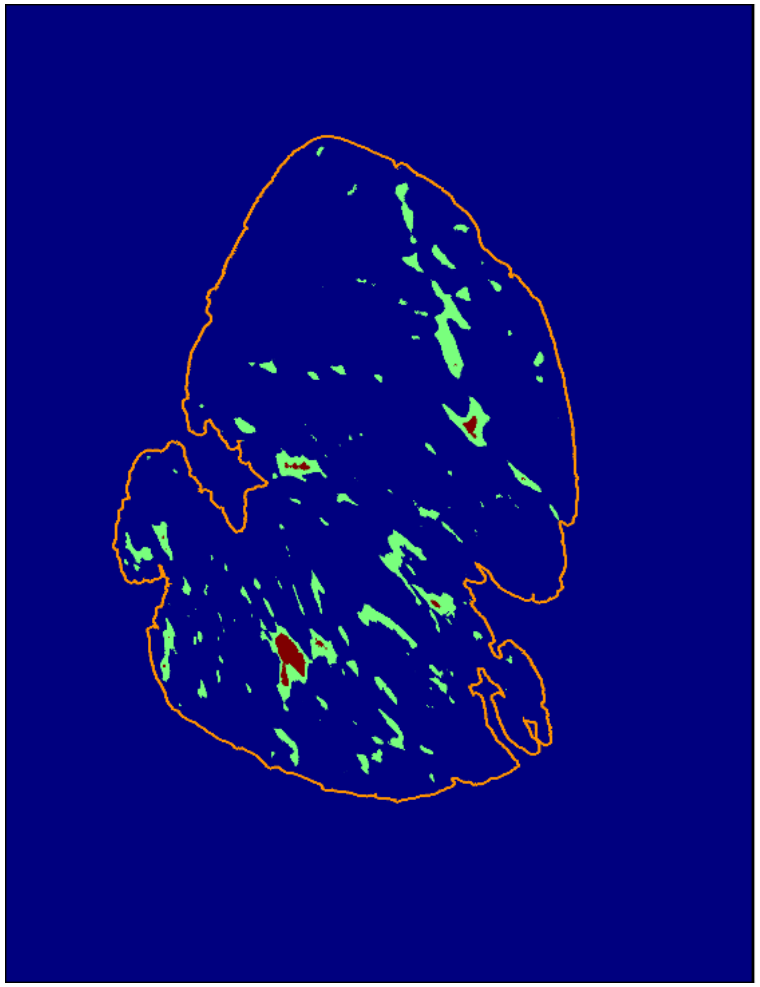
# Rib-eye grading cameras





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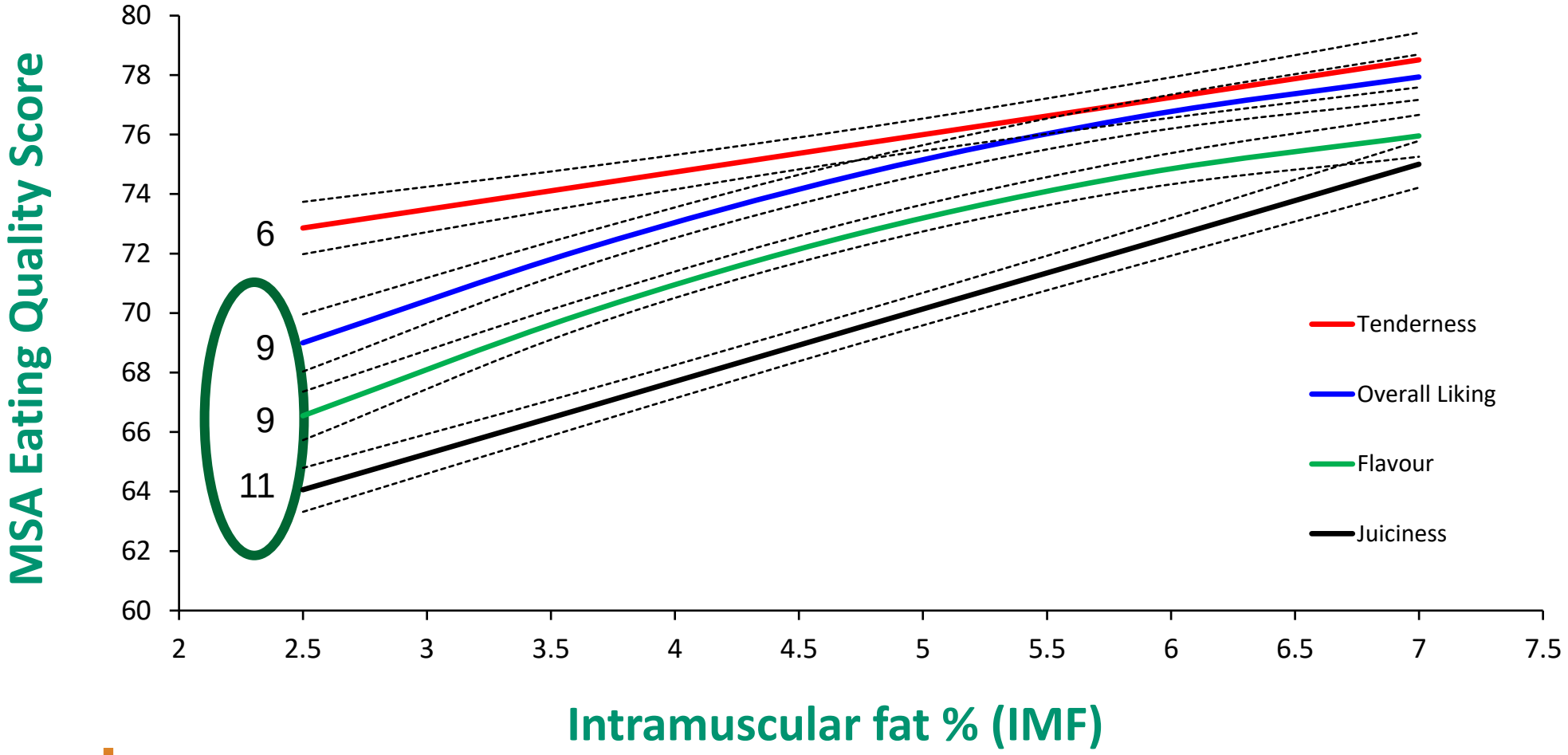
# IMF increases lamb eating quality

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# Prototype MSA Cuts Model

Maternal
Merino
Terminal

Terminal

| | | |
|---|---|---|
| Loin Overall Liking | 76.0 | 5 star |
| Topside Overall Liking | 51.0 | 3 star |

| | |
|---|---|
| Hot Standard Carcase Weight (kg) | 22 |
| IMF % | 5 |
| Eye Muscle Area ($cm^2$) | 16 |
| GR tissue depth (mm) | 12 |

Set these boxes and press to update type of graph

HCWT
IMF
CEMA
HGREAT
SF5

Overall Liking
Optimal discrimination function

Loin
Topside

Press this Button

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# Why is yield important in lamb?

Score 4

Carcase Wt. 23.0 kg

GR 20.0 mm

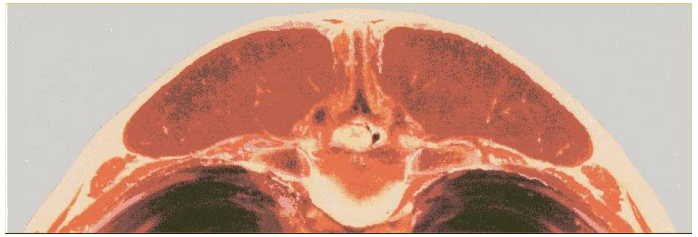
Saleable Meat Yield 48%

Score 2

Carcase Wt. 23.6 kg

GR 10.0 mm

Saleable Meat Yield 56%



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# 2.7kg extra saleable weight

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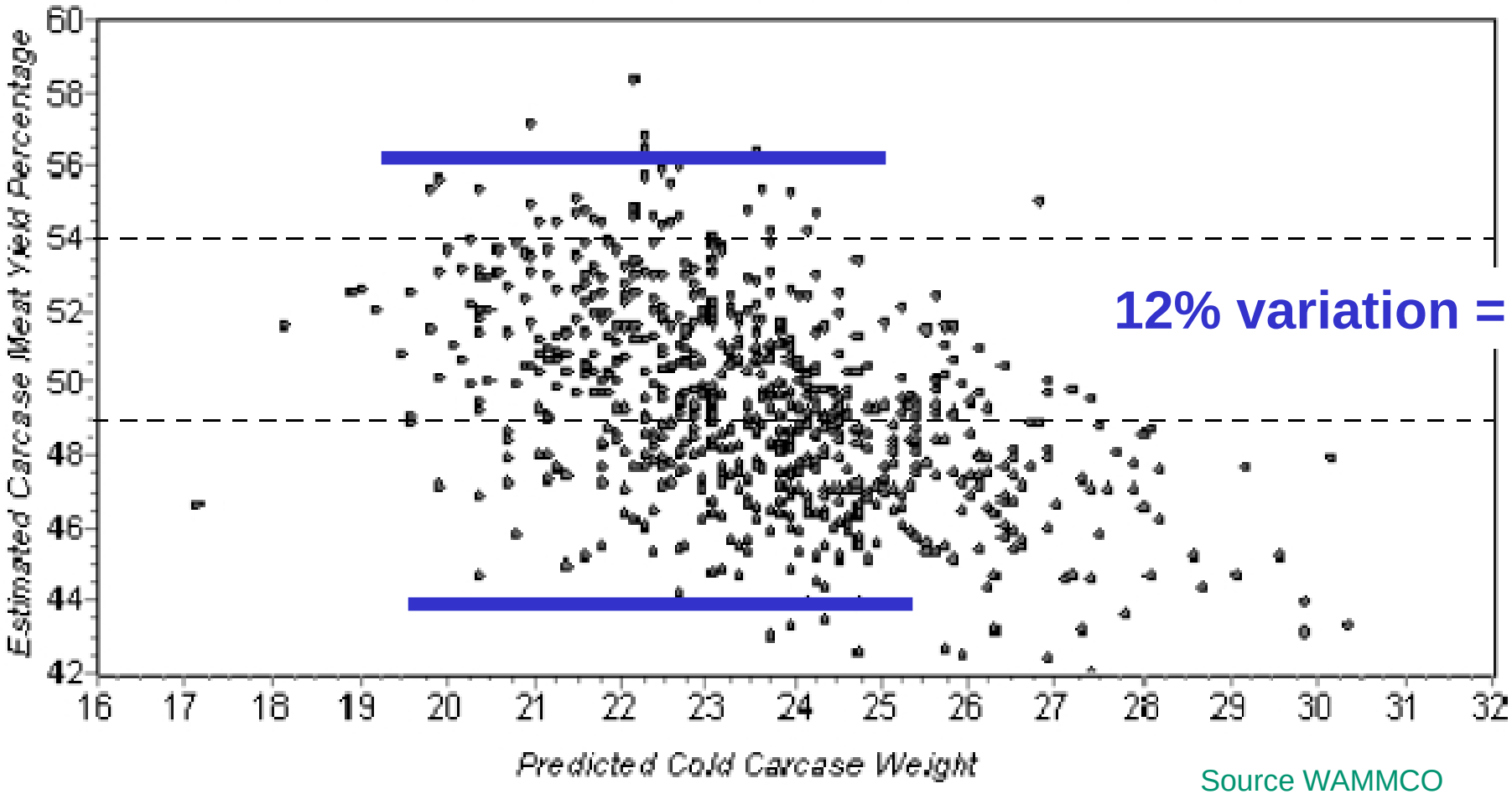
# Value of carcase yield




**12% variation = 2.7kg**

Source WAMMCO

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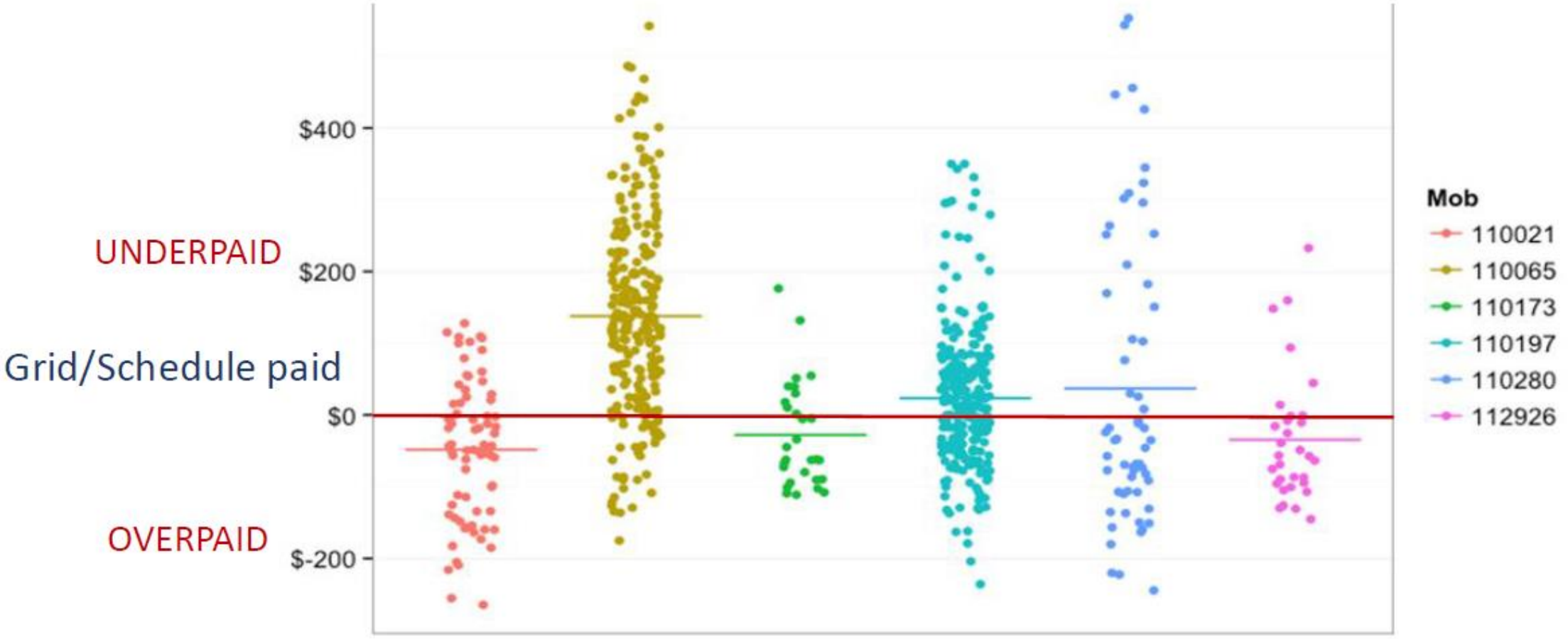
# Fat lambs are a real problem

# Excess fat costs - on-farm & in processing

- On-farm – reduced feed-efficiency (4 – 1)
- Bone-out time compared to 23kg FS3
  - FS4 = +10%
  - FS5 = +20%
  - 30 Kg FS5 = +40%

- Fat score/GR has a greater effect on profit on heavier carcases.

# Variation in beef carcase value

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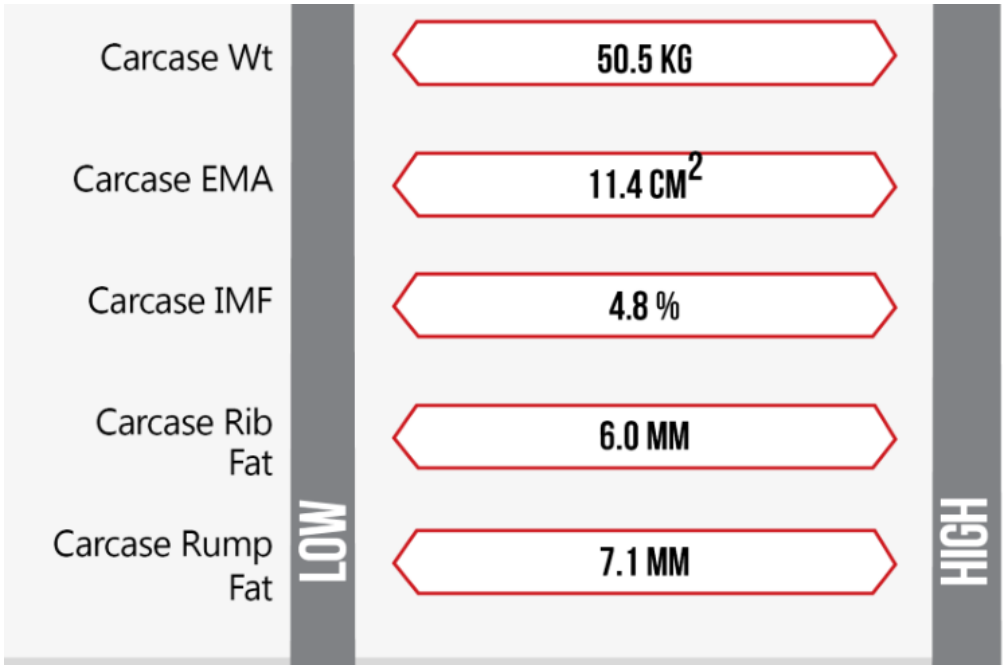
# Angus Australia Sire Benchmarking Program

**Cohort 1 – 3**: 121 sires

Top 5 v Bottom 5 Sires within year




**Cohort 4:** 21 sires

- 283 steers

Sire progeny group carcase value variation

- $619

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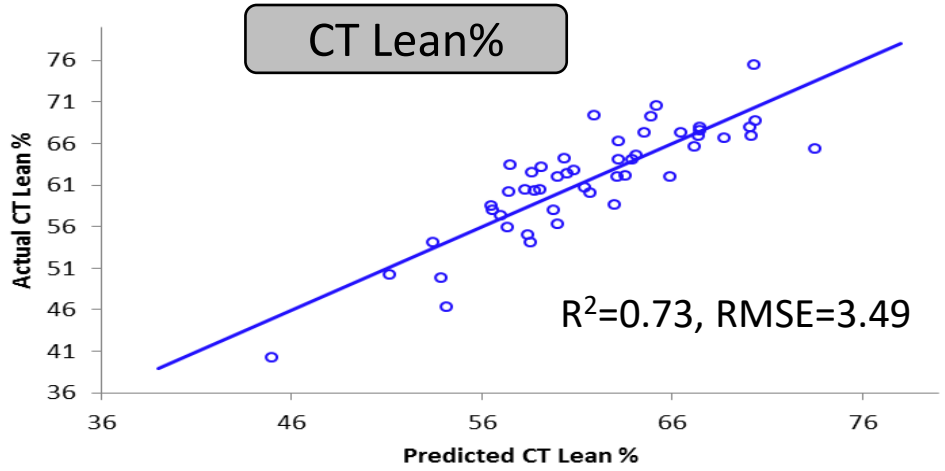
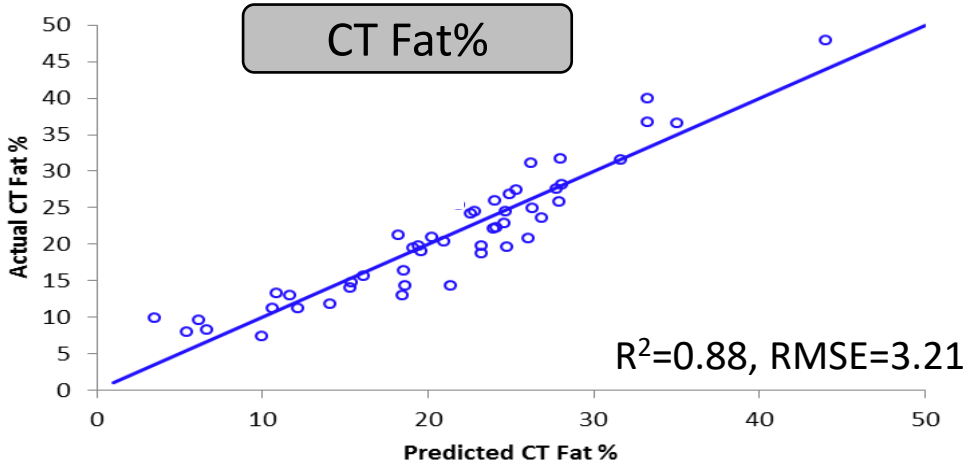
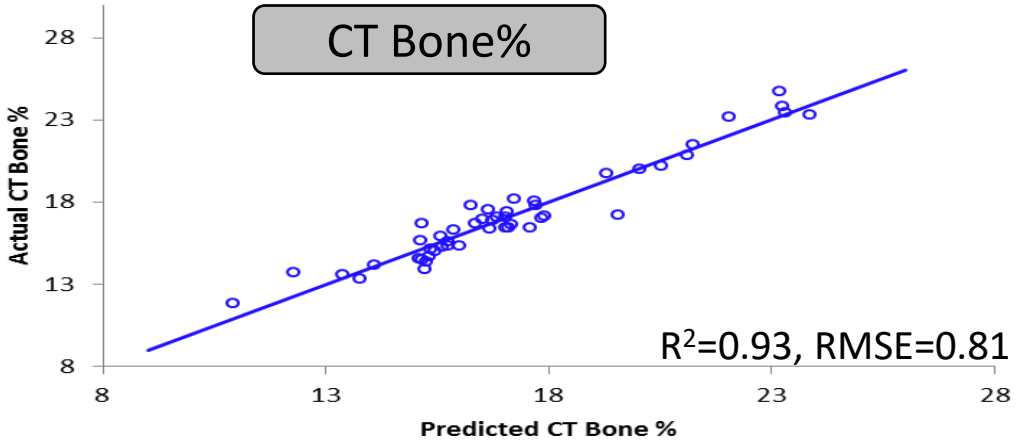
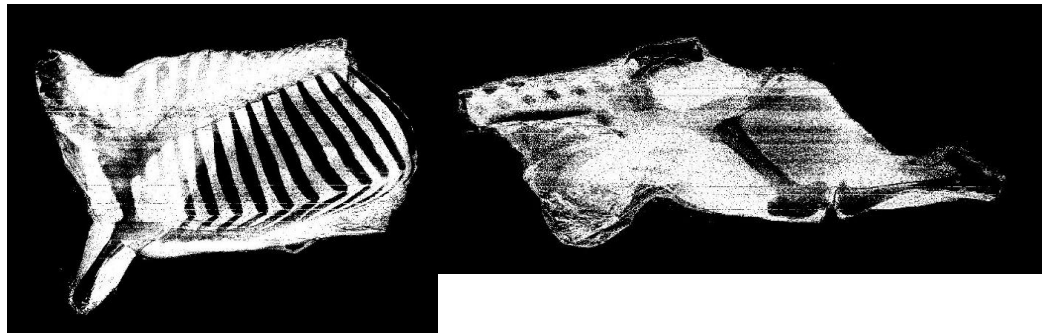
# Predicting CT Composition in Beef



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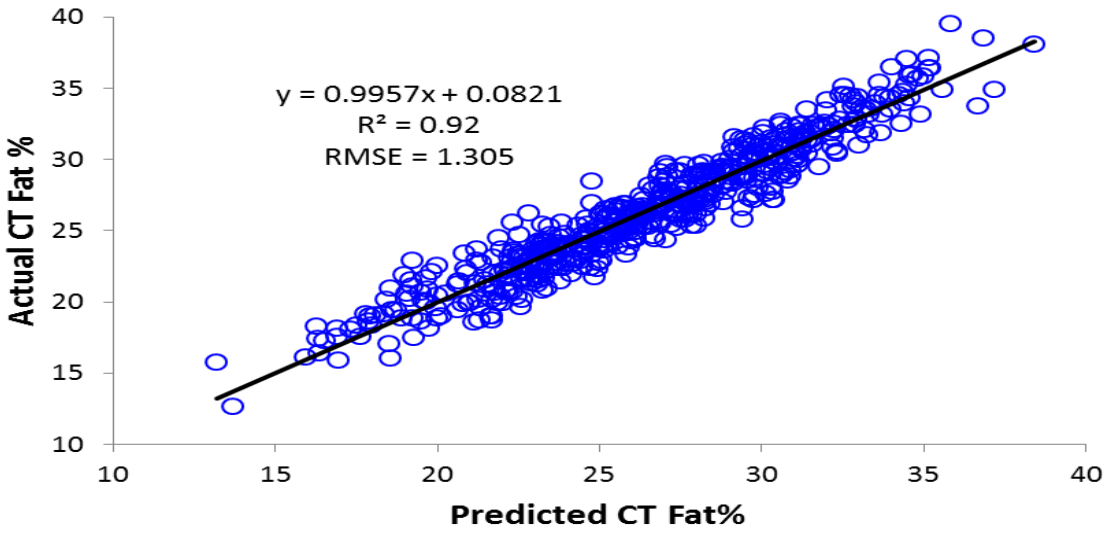
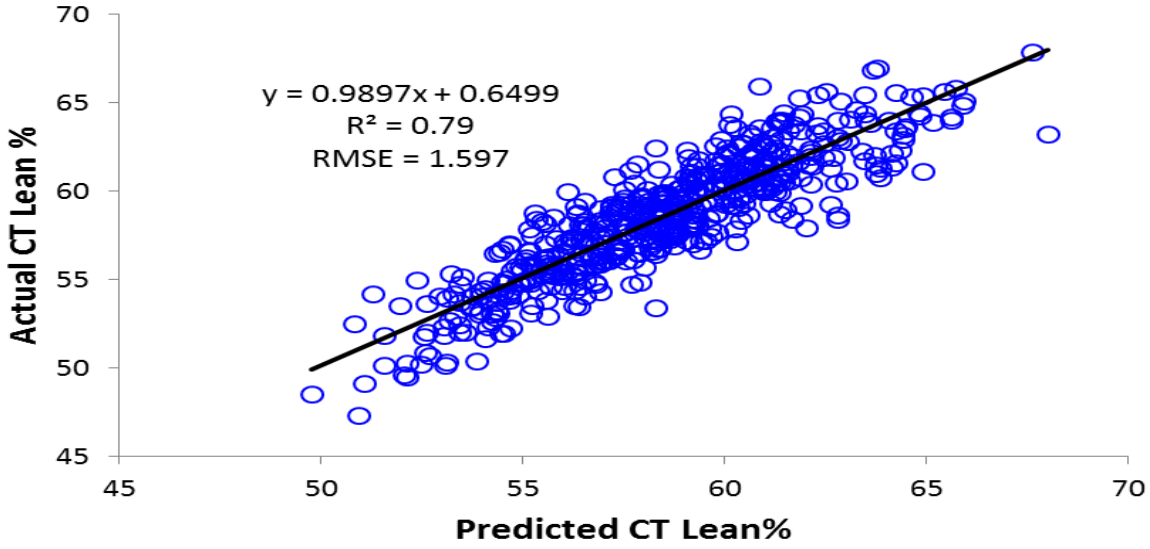
# DEXA predicting lamb CT fat and lean

CT Fat%




CT Lean%

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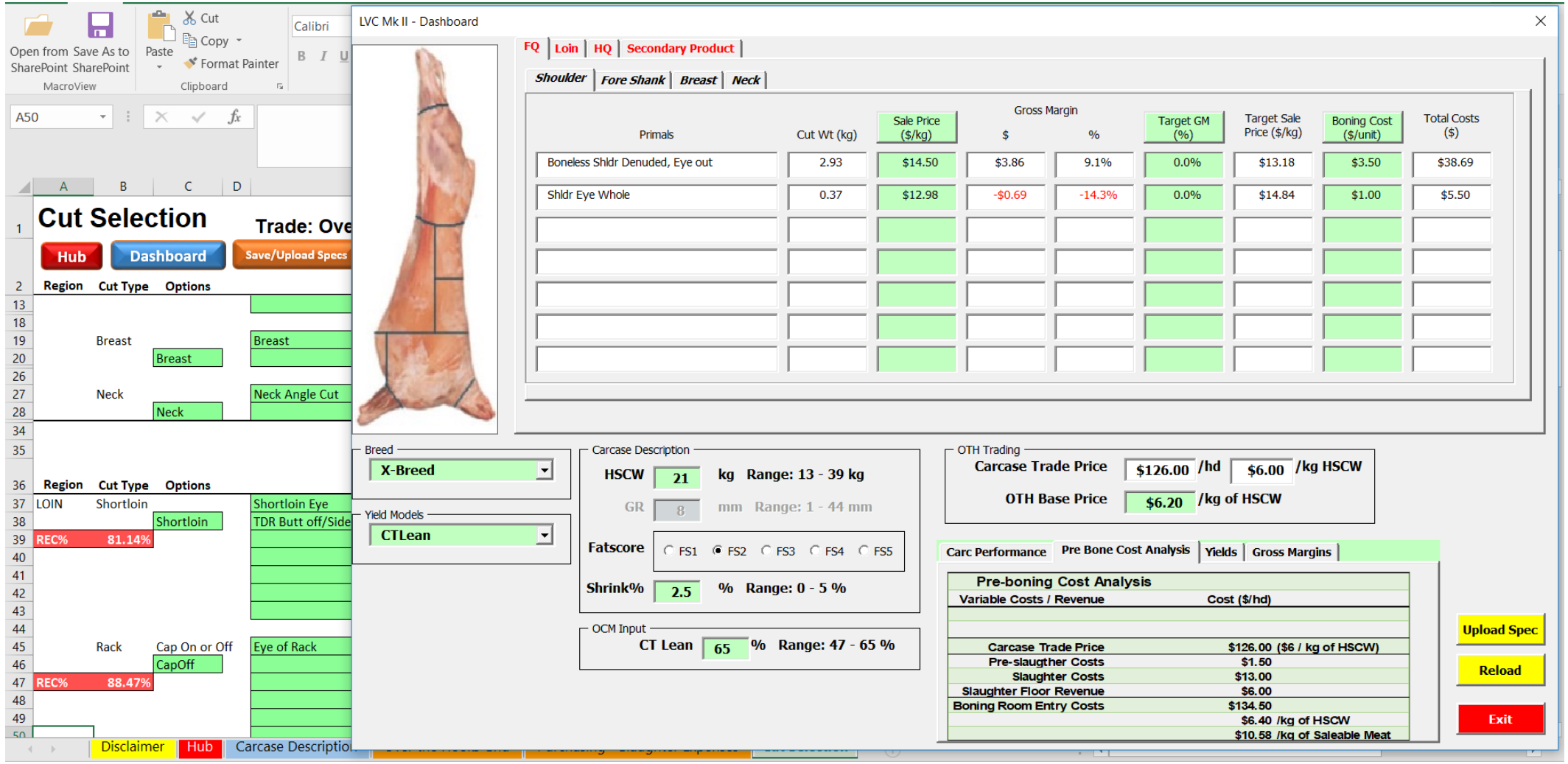
# Carcase value calculator

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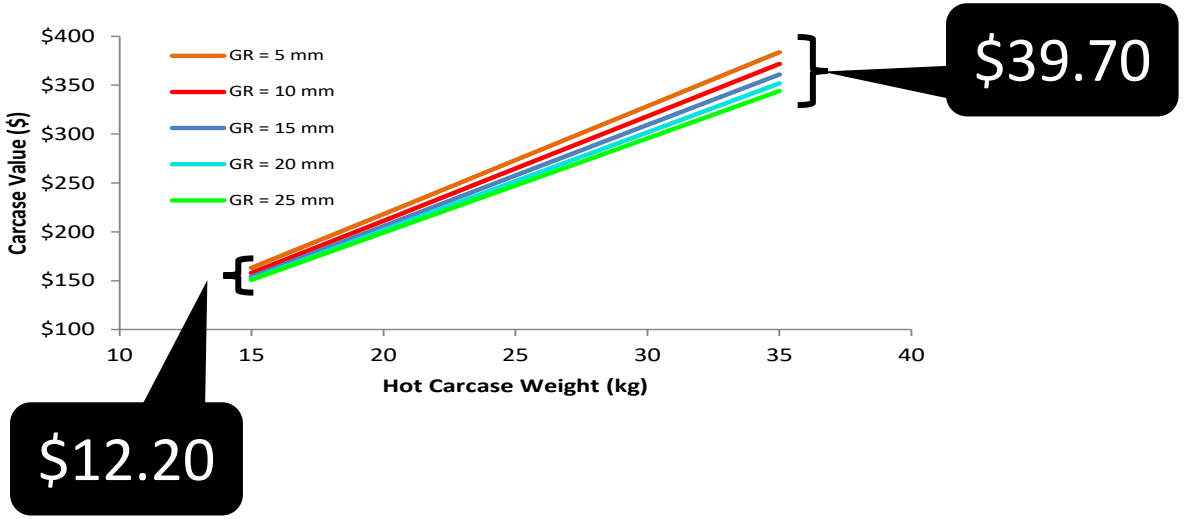
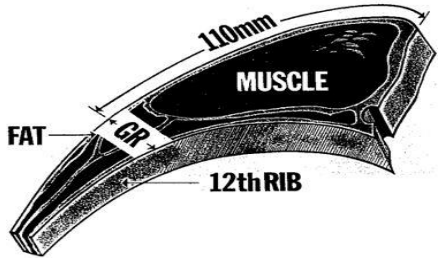
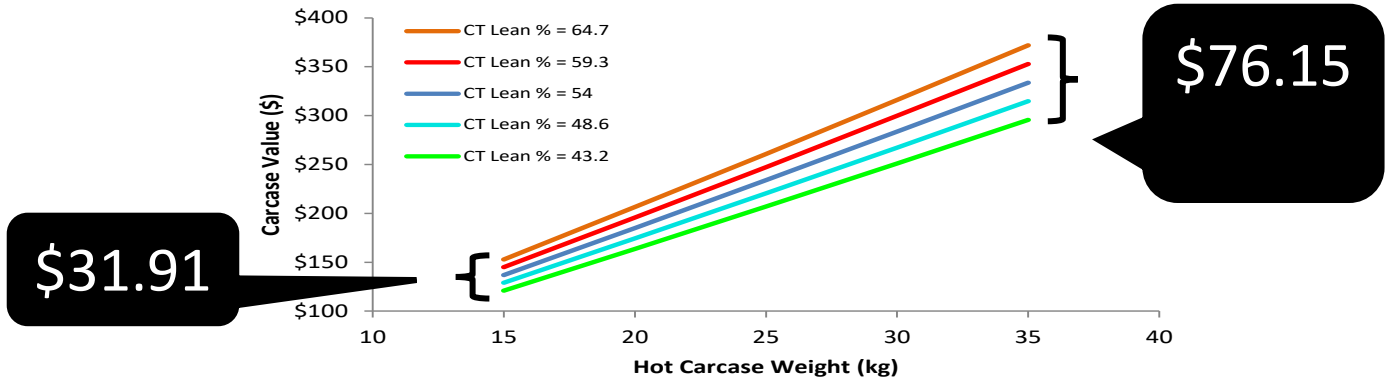
# What does extra precision mean?

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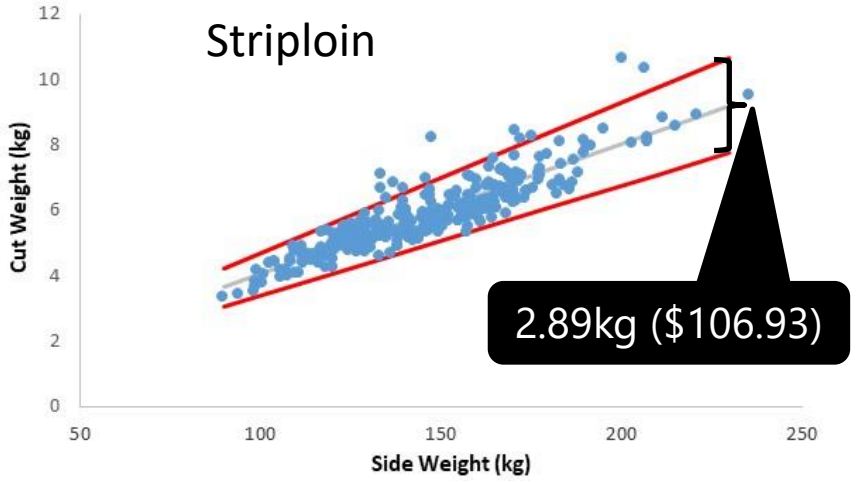
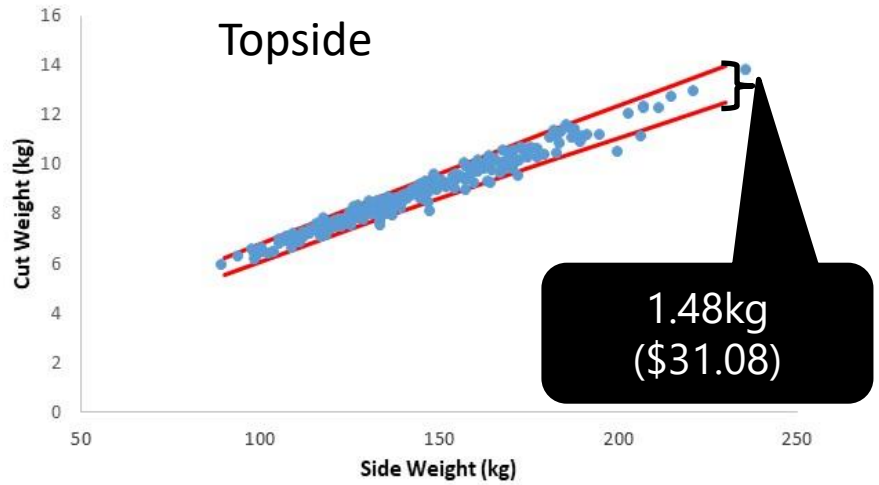
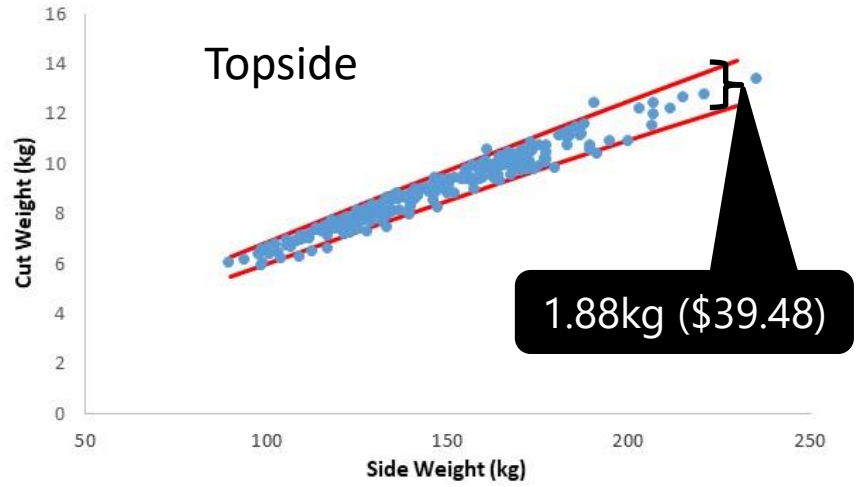
# Beef DEXA predicting cut weights

P8 model




DEXA model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A CARGILL TEYS AUSTRALIA JOINT VENTURE

SCOTT

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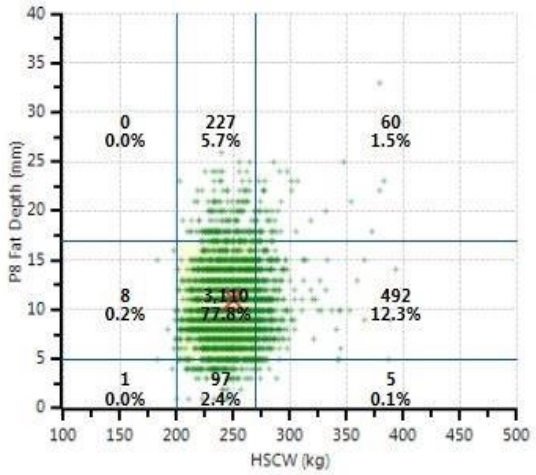
# How do I measure up?

Dashboard | Carcase analysis | Compare | Details | Compliance % | Compliance $ | MSA Summary | Carcase Trends | Supplier ranking | Grid setup

Start kill date: 01/04/2012 | End kill date: 30/04/2012 | Sex: Any | Supplier PICs: | Target market: Lightweight Yearling | Select lots: Refresh

Analysis Grid: Lightweight Yearling




| P8 Fat Depth (mm) | HSCW (kg) 0-179.9 | 180-199.9 | 200-269.9 | 270-299.9 | 300-329.9 | 330+ |
|---|---|---|---|---|---|---|
| 21+ | | | | | | |
| 17-20.9 | | | 179 | 38 | 2 | |
| 5-16.9 | | 8 | 3110 | 455 | 21 | |
| 4-4.9 | | 1 | 67 | 3 | | |
| 0-3.9 | | | 30 | 2 | | |

| Compliance | |
|---|---|
| Compliance to HSCW (kg) & P8 Fat Depth (mm) | 77.8% |
| Compliance to HSCW (kg) | 85.9% |
| Compliance to P8 Fat Depth (mm) | 90.3% |
| Compliance to Dentition | 98.7% |
| Compliance to Bruising | 100.0% |

| | Male | Female | Unknown | All |
|---|---|---|---|---|
| No. Head | 3,596 | 404 | | 4,000 |
| No. Condemned | 0 | 0 | | 0 |
| Total HSCW (kg) | 897,828.5 | 93,893.5 | | 991,722.0 |
| Max HSCW (kg) | 393.0 | 379.0 | | 393.0 |
| Min HSCW (kg) | 182.5 | 193.0 | | 182.5 |
| Avg HSCW (kg) | 249.7 | 232.4 | | 247.9 |
| Max P8 Fat Depth (mm) | 25.0 | 33.0 | | 33.0 |
| Min P8 Fat Depth (mm) | 1.0 | 1.0 | | 1.0 |
| Avg P8 Fat Depth (mm) | 10.2 | 11.0 | | 10.3 |
| Non-compliance count | 849 | 82 | | 931 |
| Non-compliance cost | $47,034.05 | $4,003.88 | | $51,037.93 |
| Non-compliance cost/head | $55.40 | $48.83 | | $54.82 |

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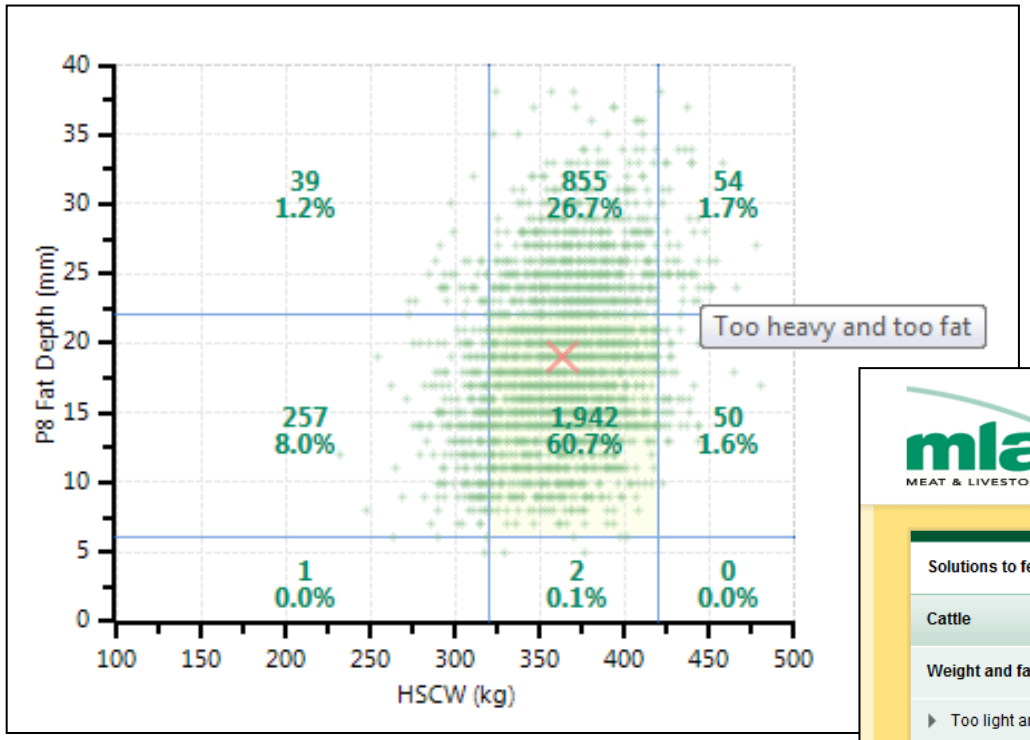
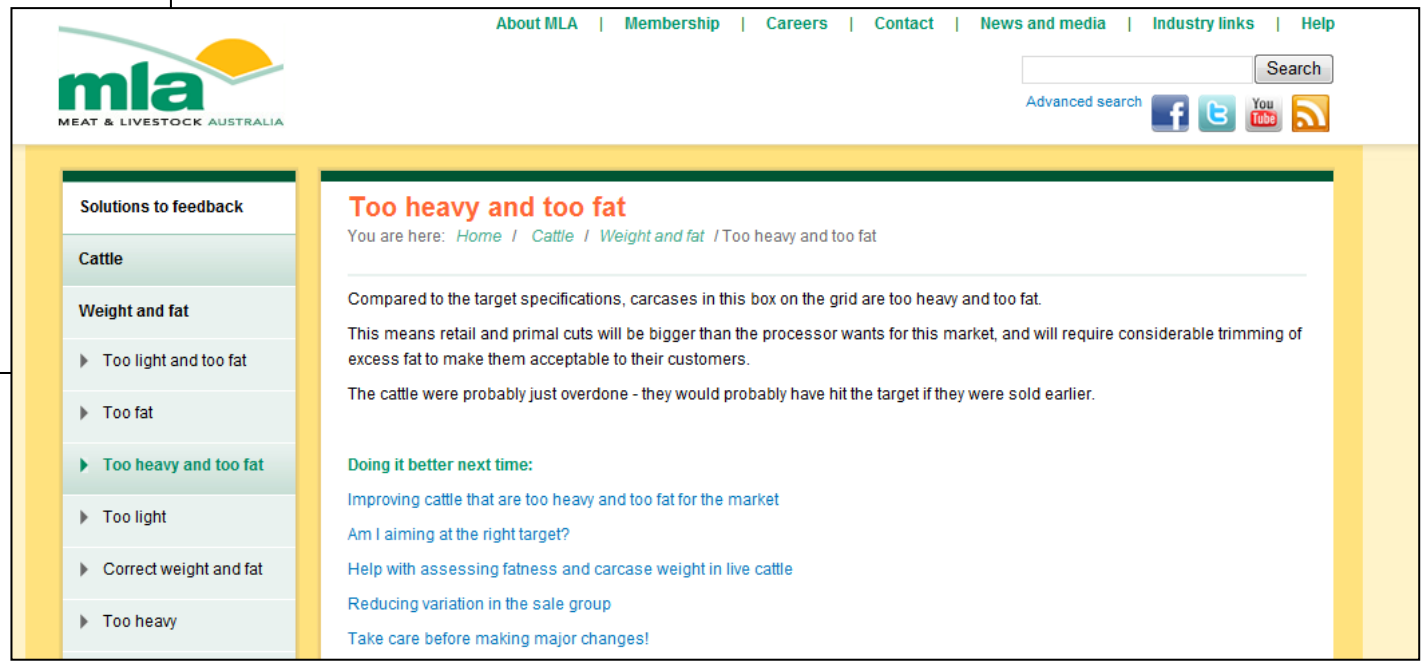
# How can I improve?

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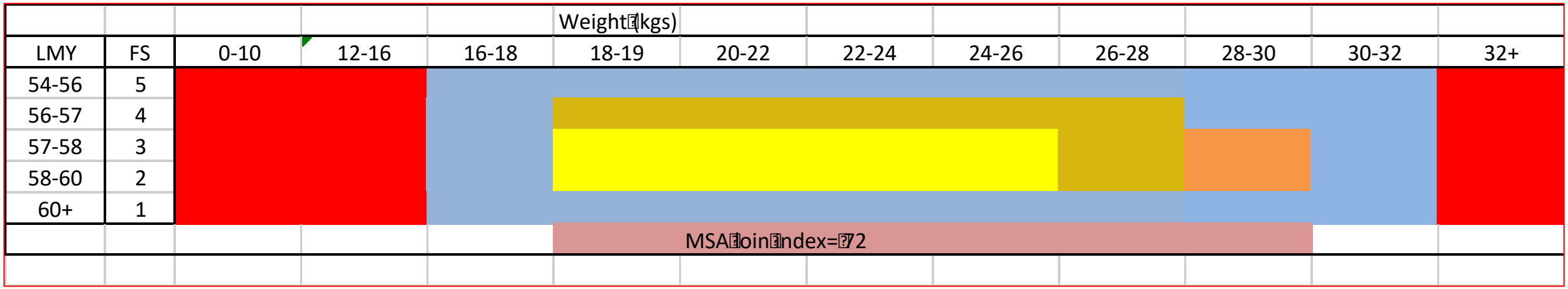
# What might future grids look like?

Will include weight.
Will include LMY (possibly forequarter, middle and hindquarter)
Will include eating quality
Possibly compliance bonus

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# Are you prepared for more detailed feedback?

**Yield**

- via Livestock Data Link (LDL) or processor feedback systems

**Quality**

- IMF key focus – cameras, probes, NIR, genetics
- Lamb – approved pathway for cuts based MSA – dependent on IMF

**Compliance to Specs**

- Buyers are becoming routinely assessed
- Suppliers will become routinely assessed and compared


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# Take home messages

- New objective measures = new carcase value feedback
- Use ASBVs, EBVs and Indexes to improve both LMY and EQ
  - balance is essential
- Develop management systems to capture genetic potential
- Use carcase feedback to benchmark and improve performance
- Develop your processor relationships

# Tools and resources

- Australian Sheep Breeding Values (ASBVs)
- BREEDPLAN EBVs
- Meat Standards Australia (MSA)
- Livestock Data Link (LDL)
- Processor feedback systems