Effect of age on sensory scores of Australian Merino sheep meat

Dr Liselotte Pannier

(session 25, p230)
Outline

- Importance of eating quality - the consumer matters
- Factors impacting on eating quality
- What do consumers think of Lamb and Yearling Meat?
Importance of Eating quality

5 pillars of consumer demand

- Integrity & Traceability
- Eating Quality
- Nutritional value
- Ethical systems
- Value & efficiency
Importance of Eating quality

5 pillars of consumer demand

- Integrity & Traceability
- Eating Quality
- Nutritional value
- Ethical systems
- Value & efficiency
Sheep meat

Lamb

- No permanent erupted teeth
- Typically max 12 months of age

Yearling

- 1- max 2 permanent erupted teeth
- Typically 12-20 months of age (or older)
Sheep meat

Lamb
- No permanent erupted teeth
- Typically max 12 months of age

Yearling
- 1- max 2 permanent erupted teeth
- Typically 12-20 months of age (or older)

Do yearlings eat as well as lambs?
What do we know...

Lamb → Age → Yearling

Shear Force → (Lower tenderness)
Hypothesis

Lamb \rightarrow \text{EQ} \rightarrow \text{Yearling}

\text{Age Shear Force}
Information
Nucleus Flock
(Sheep CRC)
Design – Sheep CRC INF

- 8 Production sites
- ± 100 sires each year
- Merino and maternal ewes
- 2000 progeny each year

⇒ Subset of pure Merino data
Design - Lambs

- 2 production sites
- N = 189
- Merino
- Killed in 2009 & 2010
- Loin & Topside *

* m. longissimus thoracis et lumborum; m. semimembranosis
Design - Yearlings

- 5 production sites
- N = 206
- Merino
- Killed in 2010
- Loin & Topside *

* m. longissimus thoracis et lumborum; m. semimembranosis
Consumer testing (0 – 100)

- Tenderness
- Juiciness
- Liking of flavour
- Liking of odour
- Overall liking
Consumer testing (0 – 100)

- Tenderness: 0 \(\rightarrow\) 100
- Juiciness: 0 \(\rightarrow\) 100
- Flavour: 0 \(\rightarrow\) 100
- Overall Liking: 0 \(\rightarrow\) 100
- Odour: 0 \(\rightarrow\) 100
Objective measures
Objective measures...

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<th>Yearling</th>
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<td>Age (days)</td>
<td>355 ± 44.0</td>
<td>685 ± 24.2</td>
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<td>Shear force (N)</td>
<td>24.9 ± 8.2</td>
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<td>Intramuscular fat (%)</td>
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What do consumers think about the EQ
Eating quality...

Overall Liking

- Lamb
- Yearling

Loin vs. Topside
Eating quality...

Overall Liking

- Loin: 2.7
- Topside: 7.1

Lamb Yearling

P<0.05
Eating quality...

Overall Liking

- Loin: 77.5 ± 2.7
- Topside: 72.8 ± 3.4

P < 0.05

Same trend!

- Tenderness
  - Loin: 4.8 ± 0.5
  - Yearling: 4.0 ± 0.6

P < 0.05

- Juiciness
  - Loin: 1.6 ± 0.3
  - Yearling: 0.9 ± 0.4

- Flavour
  - Loin: 2.1 ± 0.4
  - Yearling: 1.5 ± 0.5

P < 0.05
Association with Shear force
Shear force decreases EQ score

Sensory scores

Shear Force at day 5 (Newton)

- Tenderness
- Overall Liking
- Flavour
- Juiciness
- Odour

Loin
Shear force decreases EQ score

Didn’t explain difference between lambs and yearlings
IMF% increases EQ score

**Sensory scores**

- Overall Liking
- Flavour
- Juiciness

**Intramuscular Fat (%)**
IMF% increases EQ score

Didn’t explain difference between lambs and yearlings
Hypothesis

Lamb \rightarrow EQ \downarrow \rightarrow Yearling

Age

Shear Force
Hypothesis

Shear Force

Age

Lamb ✔

Yearling

EQ ✔
Hypothesis

Lamb ➔ EQ ➔ Age ➔ Yearling

Shear Force

✔

✔

✘
Hypothesis

Lamb ➔ EQ ➔ Yearling

Shear Force

Age ✔

IMF% ✗
Summary

Lamb & Yearling loin were not significantly different!

- Good potential for hogget loin product
- However EQ was significantly different for the topside
Summary

Shear force and IMF% don’t explain difference between Lambs and Yearlings!

- However the impact of IMF% and Shear Force on EQ is still strong
- Shear force and IMF% are good predictive indicators of EQ
- Agrees with previous published data (Pannier et al., 2014)
- The consumer can tell the difference in EQ
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- Primary Industries
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- CSIRO
Summary

Manage yield and eating quality

- Keep continue to monitor 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
Hogget product

- Market in Australia
- Hogget (1- max 2 permanent erupted teeth)
  Typically 10-18 months of age (or older)
- Lamb (no permanent erupted teeth)
  Typically max 14 months of age
Importance of Eating quality

- Evaluation of the ‘end product’
- Consumers don’t lie
- It’s a strong key driver of demand of sheep meat
- Economically - purchase and willingness to pay
What do we know....

Intramuscular fat % (IMF%)

(Pannier et al., 2014)