Can the use of novel forages increase omega-3 in lamb?

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Background

- Red meat is high in saturated fat
- Associated with CVD
- Omega-3 (PUFA) has positive health effects
  - Most pronounced for long-chain omega-3
- WHO recommends specific ratios
- Products can be labelled as a “source” of omega
Background

• Herbs & legumes
  - High nutritional value
  - Drought tolerant
  - High stocking rates
  - Anthelmintic properties

• Grass-fed lamb has higher omega-3 than concentrate-fed lamb

• Preliminary studies identified chicory to increase omega-3
Background

Fatty acid proportions

- SFA: 50%
- MUFA: 40%
- PUFA: 8%
- CLA + TVA: 2%

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Research objectives

• Assess the influence of grazing time on chicory
• Determine gender effects
• Evaluate product “source claims”
• Assess WHO recommended ratios
Methods

• 2014 under commercial conditions

• 750 maternal composite lambs

• Ryegrass vs Chicory (2, 4, 6, 8 weeks)

• Balanced for gender & weight

• Subsampled 7-10 loins per gender x treatment
Results

Growth & feed intake

Grazing treatment

Feed intake (kg/lamb/day)
Growth rate (g/day)

- Ryegrass
- 2 Weeks
- 4 Weeks
- 6 Weeks
- 8 Weeks

ADG
Feed intake (avg disappearance rate)
Carcass weight

<table>
<thead>
<tr>
<th>Ryegrass</th>
<th>2 Weeks</th>
<th>4 Weeks</th>
<th>6 Weeks</th>
<th>8 Weeks</th>
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Intramuscular fat (%)

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Medium-chain fatty acids

(mg/100g fresh muscle)
Long-chain omega-3 (mg/100g fresh muscle)

<table>
<thead>
<tr>
<th>Fatty acid (mg/1000g fresh muscle)</th>
<th>EPA</th>
<th>DPA</th>
<th>DHA</th>
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</thead>
<tbody>
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- EPA
- DPA
- DHA
Product Health claims

mg/100g cooked loin

α-Linolenic acid

EU requires 300mg
NZ/AU requires 200mg

EPA+DHA

EU requires 40mg
NZ/AU requires 30mg
World Health Organisation

Recommended Ratios

OMEGA-6:OMEGA-3

WHO recommends < 4.0

PUFA:SFA

WHO recommends > 0.4

Ryegrass

2 Weeks

4 Weeks

6 Weeks

8 Weeks

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Conclusions

• Chicory had highest medium-chain fatty acids
• Largest effects for 8 weeks on chicory
• Incremental gains for omegas
• Limitations to achieve omega-3 source claims
• Good ratio for omega-6:omega-3
• Improvement required for PUFA:SFA ratio

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Thanks