Feeding Ewes and Reproduction

Michael Friend

Nutrition and conception

- oestrous start
- minimum liveweight (eg 40-45kg for medium framed merino)
- Minerals
- plant oestrogens

Nutrition and fecundity

- To maximise ewe fecundity
  - Join ewes in condition score 3
    - 1kg liveweight = 1.1% more lambs weaned
    - Rarely cost-effective to feed supplement to increase liveweight at joining
    - "flushing" can increase ovulation

Ewes in higher condition score at joining conceive more lambs

Lupin flushing

Source: Lindsay (1988)
Live pasture is more effective than lupin grain for flushing synchronised ewes

Mean ovulation rate (2006-2008)

Ovulation rate was increased by 10% on average, with low pasture availability (drought) (<1000 kg DM/ha) compared to lupin grain. King BJ et al. (2010). Animal Reprod. Sc. (in press)

Live pasture biomass pre-flushing

Relationship between ovulation and live feed (synchronised ewes)

Flushing unsynchronised ewes: 1 week pre + joining

% twins
Bookham 2009
Jugiong 2009
Wagga 2010

Lucerne
67
44
66

Dry pasture
20
34
65

Making flushing work in practice

- Put ewes on green feed a week prior to joining
  - If enough green feed leave on for first week
- Can leave on for longer, but large amounts of high quality feed 10 days into pregnancy can cause abortion
- Needs to be accompanied by increased survival of twins
  - If scanning % increased from 130 to 143%
    - Twin survival of 50% means only 6 extra lambs/100 ewes joined
    - Twin survival of 80% means 10 extra lambs/100 ewes joined
Pregnancy and nutrition

- Maintain CS to day 90 to allow placental growth
- Preg scanning will allow separate feeding/management of dry/twins
  - more useful in poor seasons with high feeding rates

Nutrition effects on birth weight

- Depends on
  - Level of restriction
  - Timing of nutrition
    - D50-90 can affect placental weight
  - Can be influenced by BCS
  - Protein levels
  - Age of ewe
- Last trimester
  - Fat ewes in energy deficit buffer fetal growth better
  - Thin ewes may eat more but partition to maternal LW

Nutrition during early pregnancy

Source: Lifetime wool
Lamb survival and nutrition

- To maximise ewe and lamb survival
  - Manage twin-bearers separately and aim to have them in condition score 3 to 3.5 at lambing
  - Aim for 1.2 T/ha (singles) or 1.8 T/ha (twins) green feed
  - Avoid having over-fat ewes at lambing
  - Be aware of metabolic disorders around lambing

Ewe condition score at lambing and lamb survival

Conditions score profile and lifetime performance

Take Home Messages

- Join in BCS 3 where possible and maintain through pregnancy
- Consider ‘flushing’ to increase twins
- Separate twin bearers to manage more closely
- Lamb twins in BCS 3

Other nutritional stresses

- Phosphorus (eg Cattle in Qld)
  - No benefit above 0.36% P
- Vitamin E/Se
  - Plasma Se 0.08-0.12ppm
- Vitamin A and beta-carotene
  - Steriodogenesis and embryo survival
- Copper deficiency/molydenum excess
- Zinc
  - Ewe fertility and fecundity
1. Ovulation rate

2. Mean ovulation rate of ewes in Animal house trial

3. Lifetime reproductive performance

4. Shelter and lamb survival

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**Source:** Lifetime wool

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1. Singles – no shelter
2. Singles – hessian windbreaks (20m apart)
3. Twins – hessian windbreaks

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**Over 4 years (2006-2009):**

- 6.2 lambs/ewe over lifetime
- 6.7 lambs/ewe over lifetime

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**Results:**

- High and low nutrition (30 vs. 26 kg at weaning)
Shelter to increase survival

- Benefit depends on location and lambing time
- Nutrition still most important
- Target twin-bearers
  - Lamb in at least CS3
  - Consider separating into early and late lambing for shelter
- Shelter an insurance
  - May not see benefit in survival every year
  - Use existing shelter
- If designing shelter, consider economics, prevailing winds and potential other benefits

Does nutrition affect birth weight?

<table>
<thead>
<tr>
<th>Study</th>
<th>Breed and age</th>
<th>Treatment</th>
<th>Birth weight effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore et al. (1986)</td>
<td>5yo Romney</td>
<td>H/L last 6 weeks</td>
<td>None</td>
</tr>
<tr>
<td>Holst et al. (1986)</td>
<td>?yo BLM</td>
<td>H (&gt;600kg/ha)L (&lt;100kg/ha) weeks 6-15 or 15-20</td>
<td>L in late preg lowered</td>
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<tr>
<td>Arnold et al. (1977)</td>
<td>?yo Merino</td>
<td>0, 150, 300 or 500g lupins in last 4wks</td>
<td>None</td>
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<tr>
<td>Kenny (1985)</td>
<td>2.5-3.5yo BLM</td>
<td>Drought rations of wheat with or without roughage or lupins late preg</td>
<td>Lupins increased</td>
</tr>
<tr>
<td>Stephenson and Bird (1992)</td>
<td>?yo merino</td>
<td>Rhodes grass 800g/d with or without CSM and molasses late preg</td>
<td>CSM and molasses increased</td>
</tr>
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<tr>
<td>Watson and Egan (1985)</td>
<td>6yo merino</td>
<td>Wheat or wheat + protein/roughage in late preg</td>
<td>Protein and barfey straw increased</td>
</tr>
<tr>
<td>Parr et al. (1986)</td>
<td>Multiparous merino</td>
<td>D0-35 0.5M or 1.5M</td>
<td>None</td>
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<tr>
<td>McCrabb et al. (1992)</td>
<td>4-5yo Corriedale</td>
<td>Mid preg restriction</td>
<td>None</td>
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<tr>
<td>McNeill et al. (1998)</td>
<td>7yo Merino</td>
<td>Lean v fat ewes d110 onwards ad libum</td>
<td>None</td>
</tr>
<tr>
<td>Davis et al. (1981)</td>
<td>Mature Coopworths</td>
<td>H or L d 40-95 or d95 onwards</td>
<td>None</td>
</tr>
<tr>
<td>Faichney and White (1987)</td>
<td>2yo Corriedale</td>
<td>Moderate restriction d50-100, d100-135 or d95-135</td>
<td>D95-135 lower</td>
</tr>
<tr>
<td>Oddy and Holst (1991)</td>
<td>3-4yo BLM</td>
<td>4 week restriction at d79, d87 or d95</td>
<td>None</td>
</tr>
<tr>
<td>Parr et al. (1986)</td>
<td>18mo Scottish Blackface</td>
<td>Poor vs good condition fed L or H in mid preg</td>
<td>H nutrition reduced BW of good condition but increased for poor</td>
</tr>
<tr>
<td>Russell et al. (1981)</td>
<td>Adult merino</td>
<td>L, M or H at various stages</td>
<td>High throughout greater than low</td>
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<tr>
<td>Robertson (2000)</td>
<td>Romney ewe lambs</td>
<td>L, M and H throughout</td>
<td>L reduced</td>
</tr>
<tr>
<td>Conner et al. (2008)</td>
<td>Adult twin Romneys</td>
<td>L or H in mid or late preg</td>
<td>H throughout greater than L throughout</td>
</tr>
<tr>
<td>Kerslake et al. (2008)</td>
<td>Romney adults with twins</td>
<td>L and H pasture with or without 400g grain</td>
<td>H pasture with 400g grain slightly increased in 1 year</td>
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</tbody>
</table>

**Additional slides**

**Excess protein and fertility**

**Effect of 200% energy on fertility**

In beef cows, no effect of high urea feeding on pregnancy rate or embryo quality (Gath V et al., Theriogenology 51, 224).