THE EFFECTS OF LOW NITROGEN AND PHOSPHORUS DIETS
ON PREGNANT AND LACTATING EWES

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Reductions in food intake have been reported in growing lambs receiving diets
deficient in nitrogen (N) and phosphorus (P) (McLachlan and Ternouth 1985).
This experiment was designed to investigate the effects of dietary N and P
deficiency in pregnant and lactating ewes.

Twenty-four pregnant ewes (38 kg) were randomly allocated to a 2 x 2
experiment; the four dietary regimens containing high (H) and low (L)
concentrations of N and P. The basal diet (LNLP) was barley straw (4.07 g N
and 0.55 g P/kg DM) fed ad libitum with fixed quantities of molasses (210 g),
50 g wheat gluten and minerals. After lambing the quantity of supplements was
increased by 25%. The high N and P treatments were created by the addition of
urea and NaH₂PO₄ so the H and L diets contained 99.3 and 64.3 g rumen
degradable protein and 3.02 and 0.66 g P/kg DM respectively. Food intake was
monitored daily and ewe and lamb live weight weekly. Milk intake of the lambs
was measured at 21 and 28 days of age by tritium dilution (Dove and Freer
1979).

<table>
<thead>
<tr>
<th>Diets</th>
<th>HNH</th>
<th>HNL</th>
<th>LNH</th>
<th>LNL</th>
<th>s.e.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake of barley straw (g DM/d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 weeks before lambing</td>
<td>875.6</td>
<td>815.0</td>
<td>715.9</td>
<td>695.3</td>
<td>36.7</td>
</tr>
<tr>
<td>10 weeks after lambing</td>
<td>1223.5</td>
<td>1034.8</td>
<td>949.9</td>
<td>808.4</td>
<td>86.8</td>
</tr>
<tr>
<td>Ewe milk production (L/d)</td>
<td>2.04</td>
<td>1.74</td>
<td>1.66</td>
<td>1.50</td>
<td>0.11</td>
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<tr>
<td>Live weight (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ewe shortly before lambing</td>
<td>42.4</td>
<td>40.7</td>
<td>34.9</td>
<td>35.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Ewe 10 weeks after lambing</td>
<td>33.2</td>
<td>30.1</td>
<td>30.3</td>
<td>26.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Lambs at birth</td>
<td>3.9</td>
<td>3.8</td>
<td>3.7</td>
<td>3.9</td>
<td>0.1</td>
</tr>
<tr>
<td>Lambs at week 10</td>
<td>17.8</td>
<td>16.3</td>
<td>16.2</td>
<td>15.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The intakes of the barley straw were significantly reduced in the ewes fed the
N deficient diet before and after parturition (P <0.01) but the low P diets
depressed intake after lambing only (P <0.05). There were no interactions
between the N and P deficiencies on intake. The differences in straw intake
are reflected in the liveweight changes in the ewes and the amounts of milk
drunk by the lambs. There were no differences in lamb weight at birth.

The results are consistent with the earlier results of McLachlan and Ternouth
(1985) that dietary deficiencies of N and P will depress food intake. The N
deficiency appears to have an immediate effect upon food intake but the effect
of the P deficiency was delayed due to the reserves of skeletal P and the lower
P requirements of the pregnancy compared to lactation (Bass et al. 1981;
Bortolussi et al. 1988). The food intake of milking goats fed P deficient
diets was decreased by over 30% (Muschén et al. 1988).

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