EFFECTS OF BARLEY AND LUPIN SUPPLEMENTATION ON MILK COMPOSITION 
AND PLASMA METABOLITES IN LACTATING EWES

S.E. SINCLAIR AND J.M. GOODEN

The beneficial use of high energy grain supplements for lactating 
ruminants is well known. The production of sheep's milk for human consumption 
is increasing in Australia but little is known about feeding regimes for the 
production of high quality cheese. The aim of this study was to determine 
whether the feeding of barley or lupin grain to lactating ewes altered those 
constituents of milk known to affect cheese quality.

Ten crossbred (Border Leicester x Merino) ewes were housed in metabolism 
cages and milked twice daily at 0730 and 1600 hours. Five ewes were fed 
chopped lucerne:rolled barley grain (60:40 L/B) and five ewes fed chopped 
lucerne:lupin grain (60:40 L/LU). Diets were fed twice daily to meet 
calculated metabolisable energy (ME) requirements (MAFF 1975). ME offered for 
L/B and L/LU diets was 23.0 MJ/d. Sheep were accustomed to each diet for 12 
days followed by an experimental period of 10 days. Milk samples were 
collected on alternate days and blood sampling (via polyvinyl catheter, 
jugular vein) on day 4 and day 10 of experimental period. Dry matter intakes 
were measured daily and apparent digestibility over days 2 to 5. The results 
are summarised in the table.

<table>
<thead>
<tr>
<th></th>
<th>L/B</th>
<th>L/LU</th>
<th>L/B</th>
<th>L/LU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry matter intake (g/d)</td>
<td>2073</td>
<td>2077</td>
<td>1.36</td>
<td>1.32</td>
</tr>
<tr>
<td>Crude prot. intake (g/d)</td>
<td>331</td>
<td>530**</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>Apparent dry matter digestibility (%)</td>
<td>66.5</td>
<td>72.2***</td>
<td>30.7</td>
<td>32.5</td>
</tr>
<tr>
<td>Mean liveweight (kg)</td>
<td>66.2</td>
<td>65.6</td>
<td>130</td>
<td>128</td>
</tr>
<tr>
<td>Milk yield (g/d)</td>
<td>1094</td>
<td>1117</td>
<td>*</td>
<td>P&lt;0.1</td>
</tr>
<tr>
<td>Milk fat yield (g/d)</td>
<td>50.8</td>
<td>58.2**</td>
<td>**</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Milk prot. yield (g/d)</td>
<td>10.3</td>
<td>58.7**</td>
<td>***</td>
<td>P&lt;0.01</td>
</tr>
</tbody>
</table>

It is evident that lupin compared to barley supplementation resulted in 
significant changes in milk composition. The increased crude protein intake 
with lupin grain was accompanied by increases in milk protein yield and free 
amino-N in plasma. It is interesting that digestibility of barley was 
significantly lower than lupin despite a similar dry matter intake at the same 
level of ME offered. It has been suggested (Rowe et al. 1987) that barley 
supplementation reduced digestibility and utilization of energy provided by 
the diet. Further studies aim to examine whether changes in milk composition 
resulting from grain supplementation alter cheese quality.

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Dept. of Animal Husbandry, University of Sydney, Camden, N.S.W., 2570