THE USE OF HAY OR OATEN GRAIN TO FATTEN WEANER HEIFERS
GRAZING DRY SUMMER PASTURE
G.R. SAUL*

SUMMARY

Hereford weaner heifers (9 months old, mean fasted live weight 201 kg) were
fed supplements of oaten grain (0.8 or 1.6% of live weight) or ad libitum pasture
hay or lucerne hay, while grazing abundant dry standing pasture. All supplemented
groups gained live weight significantly faster than an unsupplemented, pasture
only group. The 0.8% oats, 1.6% oats, lucerne hay, pasture hay and unsupplemented
heifers gained live weight at 0.4, 0.7, 0.6, 0.3 and 0.1 kg/day, respectively. In
the oats and lucerne treatments, 80-100% of the heifers had a fat depth of >6 mm
at the end of the feeding period compared with only 27% of the pasture hay and un-
supplemented heifers. Following a 7 month common grazing period after the end of
supplementation, 28-41% of the liveweight advantage from feeding was lost due to
compensatory gain, but all supplemented groups were still significantly heavier
than the control group.

Feeding treatment had no significant effect on the percentage of heifers
showing oestrus in the 6 weeks following the end of supplementary feeding. How-
ever, live weight per se had a significant effect on the percentage cycling, with
38% of heifers <250 kg failing to show oestrus compared with only 5% of heifers
>250 kg not cycling.

INTRODUCTION

There is often a shortage of fat yearling cattle in Victoria in late autumn
and early winter due to the poor growth of weaner cattle grazing dry standing pas-
ture. Weaner cattle are often supplemented with pasture hay in an attempt to
improve growth rates but the result is very dependent upon hay quality which a
recent survey (Saul and Flinn 1983) has shown is very variable. Oaten grain,
which is usually readily available, should provide a more reliable energy source
than hay. However, while several workers (Corah et al. 1975; Morgan and Ronan
1977) have shown responses to grain supplements when fed during winter on short
green pastures, little work has looked at oaten grain supplementation in summer
and autumn. As an alternative to grain, a high quality legume dominant hay should
boost growth rates.

Heifers fatten at lighter weights than steers (Saul et al. 1982) and surplus
heifers not required for mating provide an ideal source of animals to fatten for
sale in early winter.

The aim of this experiment was to study the liveweight gain and change in fat
status of weaner heifers fed either oaten grain, lucerne hay or average quality
pasture hay while having access to abundant dry standing pasture. The carryover
effects of the feeding, during 7 months of common grazing, were also studied.

METHODS* and MATERIALS

Five groups of 11 heifers, 9 months old (allocated at random according to
stratified live weight) were stockfed at 2.4/ha and from the end of January for
121 days, fed one of the following:-

1) Pasture only - unsupplemented; pasture (sampled monthly) contained on aver-
age, 9.9% crude protein (CP), 54.1% in vitro digestible dry matter (DDM) and
65.5% neutral detergent fibre (NDF) during the feeding period.
2) Oaten grain 0.8% - fed daily in troughs, oats equivalent to 0.8% of live
weight. The ration was adjusted monthly, oats contained on average 11.9%
CP, 71.5% DDM.

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3) Oaten grain 1.6% — as above except grain was fed at 1.6% of live weight.
4) Lucerne hay — ad libitum lucerne hay, 18.9% CP, 68.6% DDM, 40.9% NDF.
5) Pasture hay — ad libitum hay 12.6% CP, 57.9% DDM, 68.3% NDF.

The heifers were grazed on an area which was subdivided immediately before the experiment started, having been grazed at a low stocking rate by cows in the previous spring. When supplementary feeding ceased in May, the heifers were grazed together as one group over the entire experimental area. A vasectomised bull was grazed with the heifers for 6 weeks from May 31 to determine the proportion of heifers showing oestrus.

Heifers were weighed monthly after a 24 h fast and the fat depth (FD) over the 12/13th rib was estimated using an ultrasonic probe (Meritronic Livestock Grader?) and the equation developed by Graham et al. (1980). The fat content of the heifers (%) fat was estimated on three occasions using tritiated water and a relationship developed by Bird et al. (1982).

Total pasture availability was estimated monthly using a weighted disc technique where a relationship between pasture height and yield was obtained by cutting quadrats to ground level. On each occasion availability was estimated, 20 'toe cuts' were cut per paddock and a sub sample sorted to determine the percentage of green pasture.

Samples of oats, hay and pasture were taken in each month during the feeding period and analysed for CP, DDM and NDF.

RESULTS and DISCUSSION

The live weight, FD and % fat figures were analysed by analysis of variance and are shown in Table 1. Also presented in Table 1 are the mean pasture availability, % green pasture, supplement intake during feeding, proportion of heifers in LMRS category 3 at the end of feeding, proportion of heifers showing oestrus and the compensatory gain during a period of common grazing on pasture.

There was an unusually high level of green pasture present in January but by late February the percentage of green pasture was 5%. The autumn break occurred at the end of April. From the end of feeding in May, all groups were grazed together and the pasture availability varied from a minimum of 1700 kg/ha in early September to a maximum of 4800 kg/ha in early November.

The results in Table 1 show that all supplements significantly (P < 0.05) improved the live weight of the heifers at the end of feeding compared with the pasture only group. However the FD and % fat levels of the pasture hay group were not significantly different (P > 0.05) from the pasture only group whereas the oat and lucerne groups were significantly fatter than the control group. The marginal feed conversion (additional LWG obtained over and above that on pasture alone per 100 kg supplement) of the 0.8 and 1.6% oat treatments was 16.5 and 15.2 kg respectively which were higher than the range of 7.3–13.6 kg achieved by Morgan and Ronan (1977) feeding Friesian steers oats on short green pasture. The marginal feed conversion figures for the lucerne and pasture hay groups were 8.1 and 7.5 kg respectively.

More than 80% of the oats and lucerne groups were of LMRS category 3 or more at the end of May whereas only 27% of the pasture hay and pasture only groups were of LMRS category 3 or above.

Following a period of 7 months common grazing, all supplemented groups were still significantly heavier (P < 0.05) than the pasture only group though 28–41% of the feeding advantage was lost due to compensatory gain. This level of compensatory gain was less than that shown by Saul and Clark (1981) with steers fed hay but similar to the levels found by Bird et al. (1980) due to stocking rate.

† Meritronics Ltd., Otterden Place, Eastling, Faversham, Kent, U.K.
differences. Although there were no significant differences in the final FD and %
fat figures, the oat and lucerne groups tended to be fatter and deposited a signif-
ically greater FD over the year than the pasture only group.

TABLE 1  Live weight (LW), fat depth (FD), fat content (% fat), pasture
availability (PA) and proportion of green pasture (%GP)

<table>
<thead>
<tr>
<th>Date and measurement</th>
<th>Pasture only</th>
<th>0.8% oats</th>
<th>1.6% oats</th>
<th>Lucerne hay ad libitum</th>
<th>Pasture hay ad libitum</th>
</tr>
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<tr>
<td>29 Jan 1980</td>
<td></td>
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</tr>
<tr>
<td>LW (kg)</td>
<td>201.5*a</td>
<td>201.8*a</td>
<td>199.8*a</td>
<td>201.5*a</td>
<td>200.7*a</td>
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<tr>
<td>FD (mm)</td>
<td>5.5*a</td>
<td>4.8*a</td>
<td>4.8*a</td>
<td>4.9*a</td>
<td>5.0*a</td>
</tr>
<tr>
<td>PA (kg/ha)</td>
<td>4600</td>
<td>4400</td>
<td>4500</td>
<td>4400</td>
<td>4500</td>
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<tr>
<td>% GP</td>
<td>17</td>
<td>19</td>
<td>21</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>21 April</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA (kg/ha)</td>
<td>1500</td>
<td>1800</td>
<td>2000</td>
<td>2500</td>
<td>1600</td>
</tr>
<tr>
<td>% GP</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>30 May</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LW (kg)</td>
<td>214.6*a</td>
<td>252.8*c</td>
<td>284.4*e</td>
<td>273.6*d</td>
<td>236.1*b</td>
</tr>
<tr>
<td>FD (mm)</td>
<td>5.3*a</td>
<td>6.4*b</td>
<td>7.3*c</td>
<td>7.4*c</td>
<td>5.3*a</td>
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<tr>
<td>% fat</td>
<td>10.7*a</td>
<td>14.4*b</td>
<td>15.4*b</td>
<td>14.7*b</td>
<td>9.8*a</td>
</tr>
<tr>
<td>LMRS 3+</td>
<td>27</td>
<td>82</td>
<td>100</td>
<td>100</td>
<td>27</td>
</tr>
<tr>
<td>Suppl. intake (kg/ha)</td>
<td>0.0</td>
<td>1.9</td>
<td>3.8</td>
<td>6.0</td>
<td>2.3</td>
</tr>
<tr>
<td>PA (kg/ha)</td>
<td>1700</td>
<td>1700</td>
<td>2100</td>
<td>2300</td>
<td>1600</td>
</tr>
<tr>
<td>% GP</td>
<td>45</td>
<td>43</td>
<td>38</td>
<td>42</td>
<td>51</td>
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<td>12 June</td>
<td></td>
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<tr>
<td>LW (kg)</td>
<td>238.9*a</td>
<td>275.1*c</td>
<td>304.4*e</td>
<td>293.4*d</td>
<td>258.7*b</td>
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<tr>
<td>% cycling</td>
<td>73</td>
<td>100</td>
<td>100</td>
<td>82</td>
<td>82</td>
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<td>25 August</td>
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<tr>
<td>LW (kg)</td>
<td>253.5*a</td>
<td>285.7*c</td>
<td>310.0*d</td>
<td>292.6*c</td>
<td>268.1*b</td>
</tr>
<tr>
<td>FD (mm)</td>
<td>5.5*a</td>
<td>6.6*b</td>
<td>6.7*b</td>
<td>6.7*b</td>
<td>5.3*a</td>
</tr>
<tr>
<td>% fat</td>
<td>9.9*a</td>
<td>13.6*b</td>
<td>13.3*b</td>
<td>12.8*b</td>
<td>10.0*a</td>
</tr>
<tr>
<td>LW (kg)</td>
<td>346.8*a</td>
<td>372.3(bc)</td>
<td>392.3*d</td>
<td>381.5(cd)</td>
<td>362.2*b</td>
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<tr>
<td>FD (mm)</td>
<td>8.4*a</td>
<td>9.1*a</td>
<td>9.2*a</td>
<td>9.7*a</td>
<td>8.2*a</td>
</tr>
<tr>
<td>% fat</td>
<td>16.3*a</td>
<td>19.3*a</td>
<td>19.6*a</td>
<td>18.7*a</td>
<td>17.1*a</td>
</tr>
<tr>
<td>Jan 1980 to Jan 1981</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LWG (kg)</td>
<td>145.3*a</td>
<td>170.5(bc)</td>
<td>192.5*d</td>
<td>180.0(cd)</td>
<td>161.5*b</td>
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<tr>
<td>FD (mm)</td>
<td>2.9*a</td>
<td>4.3*b</td>
<td>4.4*b</td>
<td>4.6*b</td>
<td>3.2(ab)</td>
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<tr>
<td>Compens. gain§ (%)</td>
<td>33.2</td>
<td>34.8</td>
<td>41.2</td>
<td>28.4</td>
<td></td>
</tr>
</tbody>
</table>

Means in the same row not followed by the same letter are significantly
different according to Duncan's multiple range test (P<0.05)
† LMRS 3 = proportion of heifers in each group of Vic. Livestock Reporting Service
Category 3 or above
‡ Unfasted live weight on June 12 and percentage of heifers showing oestrus
between May 30 and July 15
§ Compensatory gain = May (supp. – pasture only) – Jan. 1981 (supp. – pasture only)
× 100/May (supp. – pasture only).

There was no significant effect of feeding treatment on the percentage of
heifers showing oestrus. However, on re-analysis, the effect of live weight, re-
gardless of treatment, on the percentage of heifers failing to show oestrus was
found to be significant (P<0.05). Of heifers weighing <250 kg, 38% (5/13) failed
to exhibit oestrus, whereas only 8% (1/13) of 251-275 kg, 6% (1/17) of heifers
276-300 kg and no heifers (0/12) weighing >300 kg failed to show oestrus over a
6-week period.

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The results of this experiment show that feeding oat*en* grain is likely to be the most efficient method of increasing the live weight of weaner cattle grazing dry pasture. This increase may be necessary to lift the pregnancy rates of heifers or to fatten animals for sale in autumn and winter. The economic viability of the latter proposal will be very dependent upon the relative prices of feed and meat.

REFERENCES


