Hay for the dairy herd: quality or quantity?

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Hay for the Dairy Herd:

QUALITY or QUANTITY?

Recent trials have shown that late closing of hay paddocks on dairy farms gives higher quality hay, more winter grazing and a better balanced pasture.

The gain in quality more than compensates for any drop in yield.

By F. E. RYAN, Agrostologist, Dairying Division

Conservation of hay on dairy farms has increased in recent years but so far emphasis has been on quantity rather than quality and in some districts paddocks are closed up very early to increase yields per acre of hay.

Some paddocks may be closed up for 16 weeks and periods of 12 to 14 weeks are not unusual. In a normal season, from six to seven weeks seems to be adequate for a reasonable hay cut. Hay cut after closing for this time usually has a higher proportion of leaf to stem and a greater nutritive value.

During 1960, the yields of hay from plots which had been closed up for various periods on two properties in the Denmark district were measured, and samples of the hay analysed.

The 1960 season was characterised by an exceptionally dry spring and hay cutting commenced much sooner than usual. The result was that hay yields were lower than would normally be expected.

EXPERIMENT 1

F. C. Smith, Denmark.

One such demonstration was conducted on the property of F. C. Smith, where sections of a paddock were progressively fenced off from grazing from May 16, June 28, August 1, September 3 and October 1, until all plots were cut for hay on November 8, 1960. The results are shown in the following table:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield of Hay</th>
<th>Crude Protein</th>
<th>Crude Fibre</th>
<th>Nitrogen free extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Closed 16/5/60</td>
<td>1.9</td>
<td>7.5</td>
<td>31.9</td>
<td>55.0</td>
</tr>
<tr>
<td>B. '' 28/6/60</td>
<td>2.1</td>
<td>7.5</td>
<td>32.3</td>
<td>53.1</td>
</tr>
<tr>
<td>C. '' 1/8/60</td>
<td>2.9</td>
<td>10.2</td>
<td>23.0</td>
<td>52.7</td>
</tr>
<tr>
<td>D. '' 3/9/60</td>
<td>1.7</td>
<td>14.3</td>
<td>23.9</td>
<td>51.5</td>
</tr>
<tr>
<td>E. '' 1/10/60</td>
<td>0.9</td>
<td>17.7</td>
<td>22.4</td>
<td>49.6</td>
</tr>
</tbody>
</table>

Quality:

From the table it is obvious that there is a dramatic increase in percentage of crude protein as the period of closing is reduced. At the same time there is a reduction in the crude fibre content from 31.9 to 22.4. Hay from plots closed on 3/9/60 and 1/10/60 would be much more valuable for summer and autumn feed than hay from plots closed earlier.

Yield:

The yield of hay is also of considerable interest. No advantage in weight cut was
obtained from closing in May or the end of June, and closing at the beginning of August resulted in the highest yield of 2.9 tons an acre. It must be remembered that the season ended much sooner than usual in 1960 and that in many years, hay cutting at Denmark can occur from late November to late December so that closing up at the beginning of August could be too soon in these districts.

One result of early closing for hay was a reduction in the amount of grazing obtained from the paddock; there was an obvious loss of grazing from closing earlier than August 1. In these trials, the grazing obtained between August 1 and September 3 could easily have accounted for most of the difference in yield between treatments C and D, and the better quality of hay from D would have more than justified the lower yield of hay.

**Botanical Changes:**

The influence of early closing on the botanical composition of the pasture was of major importance, as shown in Table 2. This composition was judged visually.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Composition at Hay Stage</th>
<th>Stage of development at Cutting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clover %</td>
<td>Grass %</td>
</tr>
<tr>
<td>A. Closed 16/5/60</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>B. 28/6/60</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>C. 1/8/60</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>D. 3/9/60</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>E. 11/10/60</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Plots from which stock were excluded early in the autumn deteriorated badly. Grasses became dominant and tended to exclude clovers, and inferior species such as Yorkshire fog and silver grass appeared.

On the plots which had been closed later in the season, the grass-clover balance was maintained and the more valuable grasses such as perennial ryegrass developed as the most important species.

**Rust Infection in Clover:**

Early closing encouraged rust infection on subterranean clover. A rating of the percentage of leaves showing rust infection at hay time is given in Table 3.

**Amount of Grazing:**

During the spring, pastures provide adequate grazing but it is in short supply from April to September. Early closing for hay has the serious disadvantage of restricting the amount of grazing during late winter and early spring months. In this demonstration, pastures were grazed each time they produced sufficient feed to warrant it, usually when they reached a height of four or five inches. The number of grazings obtained is shown in Table 4.

Much more grazing was obtained from the late closed paddocks, and in spite of the very dry spring satisfactory hay cuts were obtained from closing at the beginning of September.

**EXPERIMENT 2**

W. Middleton, Denmark.

A second demonstration was carried out on W. Middleton's property at Denmark. Three times of closing were used:—May 25, July 2 and August 15.
The result in this case was similar to that in the previous demonstration. Earlier closing did not result in any greater weight of hay but there was a great improvement in the protein content of the hay if closing of the paddock was delayed until August 15.

The yield of protein an acre was greatest from the area last closed, as is shown by Table 6.

**TABLE 6.—YIELD OF PROTEIN**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Hay Yield</th>
<th>Crude Protein in Dry Matter</th>
<th>Crude Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Closed 25/5/60</td>
<td>2.2</td>
<td>6.8</td>
<td>254</td>
</tr>
<tr>
<td>B.</td>
<td>2/7/60</td>
<td>2.1</td>
<td>13.7</td>
</tr>
<tr>
<td>C.</td>
<td>15/8/60</td>
<td>2.5</td>
<td>17.2</td>
</tr>
</tbody>
</table>

* Assuming 15 per cent. moisture in the hay.

**Botanical Changes:**

The pasture originally consisted of a good stand of Yarloop and midseason subterranean clover with some Yorkshire fog and annual grasses.

At hay cutting time, the pasture consisted of:

**Treatment A, closed 25/5/60:** Grass dominant, with high proportion of Yorkshire fog and silver grass; less than 20 per cent. subterranean clover.

**Treatment B, closed 2/7/60:** Similar to treatment A, containing less than 20 per cent. clover.

**Treatment C, closed 15/8/60:** 60 per cent. subterranean clover, 40 per cent. grass.

Early closing resulted in a dominance of inferior grasses and a reduction in sub-clover content, while late closing gave a much better grass-clover mixture.

**Subterranean Clover Rust:**

Rust infection of both Yarloop and midseason sub-clover occurred at the beginning of the season, but the pasture grew away from the rust during the winter and there was no recurrence until late spring. At that time, less than 10 per cent. of leaves of midseason clover on treatments A and B showed rust infection, and there was no infection on treatment C.

Yarloop clover was not affected by rust in the spring of 1960.

**COMMENTS**

The decision of when to remove the stock from a hay paddock before cutting for hay will vary from district to district and from paddock to paddock, but it is obvious that even in one district and on similar paddocks there is a wide divergence of opinion among farmers as to when to close.

In general, most farmers err on the early side and most paddocks are closed too soon.

One aspect which has encouraged this approach is a tendency of the farmers to graze the pasture too severely before closing up, on the assumption that one must get as much grazing as possible before closing. There is ample evidence to show that this practice retards recovery after grazing and may easily delay growth for two or three weeks.

The demonstrations detailed above in the Denmark area were carried out during a very dry spring. In a normal year, September or even October may be the best time to close some paddocks, particularly those in low lying or moist situations.

The fall in protein content with increasing age of the pasture, and the increase in fibre content as the pasture grows taller are to be expected. The canopy of green leaves tends to remain constant and the proportion of stem to leaf to increase.

A hay cut at Denmark Research Station was separated into leaf and stem and these were analysed separately. The results give some indication of the importance of having a high proportion of leaf in the hay. Protein and fibre are given as percentage of total dryweight.

<table>
<thead>
<tr>
<th>Protein.</th>
<th>Fibre.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td>24.5</td>
</tr>
<tr>
<td>Stems</td>
<td>14.3</td>
</tr>
</tbody>
</table>

It is obvious that high quality hay is not obtained from pasture growing over a long period, and more satisfactory hay material of higher nutritive value could be obtained from pasture closed later in the season.
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