Meadow hay for the dairy herd

F E. Ryan
MEADOW HAY FOR THE DAIRY HERD

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Conservation is the basis of progress in dairy farming and the major form is meadow hay, but unfortunately relatively few dairy farmers give enough attention to the quality and quantity of this important feed.

The 1964 Department of Agriculture Dairy Officers Conference agreed that the amount of conservation necessary for successful dairying should be a hay equivalent of 2 tons per milking cow.

All forms of conservation such as hay, silage or fodder crops, would be included in this estimate and a farmer having an area of irrigated pasture during the summer months would also be in a position to reduce the amount conserved per cow accordingly. However, even where irrigated pasture is available, some dry feed such as hay should be used.

The amount conserved on any one farm will depend on local conditions such as summer moist areas or a favourable extended rainfall season or fertile soils. Hence the general figure of 2 tons hay equivalent per milking cow may not apply in particular cases.

Taking an average yield of 35 cwts. per acre of meadow hay and assuming that all conservation is as hay then the percentage of the farm cut each year to provide 2 tons per cow will increase with stocking rate in the following way.

<table>
<thead>
<tr>
<th>Stocking Rate</th>
<th>Per Cent. of Area Cut Each Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>One milking cow to 4.5 ac.</td>
<td>25</td>
</tr>
<tr>
<td>One milking cow to 4.0 ac.</td>
<td>29</td>
</tr>
<tr>
<td>One milking cow to 3.5 ac.</td>
<td>33</td>
</tr>
<tr>
<td>One milking cow to 3.0 ac.</td>
<td>38</td>
</tr>
</tbody>
</table>

At higher stocking rates the area needed to be cut will increase still further but at this point other methods of conservation should be considered, such as the use of fodder crops, inclusion of perennial pasture species to provide more autumn and late spring pasture production,

Sufficient hay should be preserved for feeding over a nine-month period, therefore protection from the weather is necessary.
and even such items as the use of nitrogen fertiliser to stimulate winter production from pastures. It would also be necessary to spread the operations for conserving the spring flush and perhaps under these conditions to make silage as well as hay.

**Hay Quality**

Cows require conserved fodder of high quality and this is provided by good clover grass pastures if closed for a short time, cut at the right stage and cured quickly. Grasses and clovers have a high nutritive value at first flowering but thereafter this value declines rapidly. Varieties which flower late in spring retain their nutritive value later in the year.

The chances of suitable hay making conditions improve as the season advances so that the farmer should plant the latest flowering varieties which will persist in his environment. Tallarook sub-clover is later than Mt. Barker and both are later than Yarloop. Wimmera ryegrass and Yorkshire fog are early flowering when compared with perennial ryegrass, Phalaris tuberosa or Cocksfoot.

Apart from the time of cutting, attention should be given to the period between closing and cutting. Eight weeks is adequate for this; if the pasture is closed longer there is often a decline in quality because of increasing age.

If pastures are closed for too long their quality deteriorates and even the yields may decline. The following table from an experiment at Busselton shows this effect.

<table>
<thead>
<tr>
<th>Period Closed</th>
<th>6 weeks</th>
<th>8 weeks</th>
<th>10 weeks</th>
<th>12 weeks</th>
<th>14 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield of Hay—cwts./ac.</td>
<td>25.3</td>
<td>39.4</td>
<td>44.0</td>
<td>43.5</td>
<td>41.5</td>
</tr>
<tr>
<td>Percentage Crude Protein</td>
<td>15.5</td>
<td>11.3</td>
<td>9.4</td>
<td>9.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Crude Protein—cwts./ac.</td>
<td>3.9</td>
<td>4.5</td>
<td>4.1</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Digestible Protein—cwts./ac.</td>
<td>2.6</td>
<td>2.7</td>
<td>2.4</td>
<td>2.3</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Cows in milk require a high level of protein in their diet and this level in hay is influenced by the date of cutting. The decline in protein content with delayed date of cutting is shown in results of an experiment carried out at Harvey.

<table>
<thead>
<tr>
<th>Cutting Date and Percentage Protein</th>
<th>4 Oct.</th>
<th>17 Oct.</th>
<th>1 Nov.</th>
<th>15 Nov.</th>
<th>29 Nov.</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 6 weeks</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>After 8 weeks</td>
<td>19.0</td>
<td>15.8</td>
<td>13.4</td>
<td>11.4</td>
<td>9.0</td>
</tr>
<tr>
<td>After 10 weeks</td>
<td>14.8</td>
<td>12.8</td>
<td>11.1</td>
<td>9.4</td>
<td>7.4</td>
</tr>
<tr>
<td>After 12 weeks</td>
<td>12.8</td>
<td>11.1</td>
<td>9.4</td>
<td>7.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Mean</td>
<td>19.0</td>
<td>15.3</td>
<td>13.0</td>
<td>10.6</td>
<td>9.6</td>
</tr>
</tbody>
</table>

Classify hay according to quality when carting it for stacking.
Curing

Hay curing means rapid handling and drying to a stage where the material can be safely baled. The moisture content at the time of baling should not be less than 15 per cent, but can be as high as 20 per cent. Unfortunately there is no easy method of determining when this stage is reached. The cut material should retain its green colour and should be pliable without fracturing.

The method of handling the material to obtain rapid drying will vary with the weather conditions, density of the sward, dampness of the soil surface and the ability of the stubble for holding the material off the ground. The surface of the swathe will dry out rapidly when left as cut with the mower on the paddock, but it should be turned or tedded as soon as possible to permit the underside to dry out. It is unwise to wait too long before turning since the leaves may become brittle and fracture thereby losing the most valuable part of the hay. If weather conditions are not favourable further turning or tedding may be necessary and this should always be done before leaves become brittle.

Windrowing is usually carried out prior to and in preparation for baling. The principle of doing this rapidly before the leaves become brittle should be followed. Thus if the weather is good for hay making, the mowing could take place in the morning, the first tedding during the same afternoon, windrowing next morning and baling during the afternoon or the following morning. The hay is therefore baled in 36 to 48 hours after cutting.

Losses during curing can occur from:
1. Respiration of cells before they are killed.
2. Leaching of nutrients in wet conditions.
3. Attacks by moulds and bacteria if the material is wet.
4. Shattering of leaves if allowed to dry out too much.

In recent years more attention has been given to rapid curing of hay. Hay conditioners are machines which crush or crimp the stems to hasten their drying. The development of a flail type rotary mower which breaks the grass into short lengths is also an attempt to achieve this purpose. Another method which has received attention is the use of a forage harvester for cutting pasture in preparation for hay making. The cut material is blown out in rows onto the stubble behind the machine, and providing it does not chop the material excessively, this method has been successful in obtaining rapid drying. For hay which is cut early, techniques such as these may be necessary to make use of short periods of fine weather.

Hay Feeding

Feeding out of hay, particularly on the ground can be a source of serious loss, as it quickly become dry and brittle, therefore susceptible to leaf losses by shatter-
ing. If possible it should be fed in racks or troughs or hammer milled to minimise this loss. The bale strings should be removed only when the hay is tipped into the rack.

On every farm there will be a range of quality in the hay according to the time of cutting and weather conditions during curing. Early cut material will have the highest content of digestible protein and should be fed during the summer and autumn. Later cut material is more suitable for feeding in winter and early spring when a lower protein content in the hay is not so critical. In practice, hay should be graded according to quality during stacking to permit efficient feeding out.

Hay cut after a short period from closing is usually found to be more palatable and this could be very important for feeding in autumn immediately before and after calving. It is usually more digestible as well as more palatable and should encourage sufficient daily intake of digestible nutrient by cattle at this critical stage.

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