14 Grazing high-yielding cows

Objective:

- To produce a higher proportion of milk from grazing.

Challenge:

- Establish your current level of milk production from grazed grass
- Set an achievable target for improvement this year
- Plan for Maintenance + 2500 litres from grazing in the next three years.

Target

Achieve M+ 2500 litres from grazed grass or 25% of annual milk output from grazing.

High Yields from Grass

With their greater hunger drive, high-yielding cows can produce more milk from grazing than other animals under similar conditions. Research has shown they will consume 1-2kg more forage DM/day at grass providing the sward allows them to do so.

The key challenge in grazing high-yielding cows is to provide them with upright, dense and palatable swards.

It is important to appreciate that M+25kg milk/day is the realistic maximum that can be achieved from grazing before supplementation is required (Section 6).
Action plan

To achieve M+2500 litres or 25% of your annual milk output from grazed grass.

1. Maximise Your Sward Quality

Balance your grazing pressure and sward growth carefully throughout the season, adjusting allocations to growth daily (Page 14:4).

2. Maximise Your Cow Intakes

Achieve the highest possible economic grazing intakes from your herd (Page 14:5).

3. Optimise Concentrate Supplementation

Supplement cows giving more than 25 litres/day at grass with appropriate concentrates, only using buffer forages when fresh grass is in short supply (Page 14:12).
To help with application and understanding of this chapter please refer to Factsheet 13; The Crichton Star System.

**Sward quality**

Maximising herbage intake is the key to realising the higher milk-from-grazing potential of high-yielding cows.

The amount of sward consumed depends on the cow’s inherent hunger drive, with research consistently showing higher production merit animals eating 1-2kg more forage DM/day than medium merit stock.

Daily grazing intake depends on the amount of time spent grazing, the biting rate and the intake/bite – which, in turn, depends on the characteristics of the sward.

A small increase in intake/bite can have a significant effect on daily intake (Figure 14.1).

**Figure 14.1: The Components of Sward Intake**

<table>
<thead>
<tr>
<th>Intake/Bite (g DM)</th>
<th>Biting Rate (bites/min)</th>
<th>Grazing Time (min/day)</th>
<th>Grazing Intake (kg DM/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.45</td>
<td>60</td>
<td>600</td>
<td>16.2</td>
</tr>
<tr>
<td>0.55</td>
<td>60</td>
<td>600</td>
<td>19.8 (+ 22%)</td>
</tr>
</tbody>
</table>

Together sward and behavioural limitations prevent increases in milk output beyond a certain level being supported by parallel increases in sward intake.

The upper limit of sward intake by dairy cows under excellent grazing conditions is around 17kg DM/head/day, the top quartile of good graziers should achieve 15kg DM/head/day, although intakes of around 20kg have been reported under experimental conditions.

An intake of around 17kg forage will support yields of around 25kg/day; at 30kg milk output supplementation is essential (Table 14.1).

**Table 14.1: Supplementary Concentrate Levels for Higher Yielding Cows**

<table>
<thead>
<tr>
<th>Target yield (kg/day)</th>
<th>Early Season</th>
<th>Mid/Late Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>27</td>
<td>29</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential from grass (kg/day)</th>
<th>Early Season</th>
<th>Mid/Late Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>29</td>
<td>31</td>
</tr>
<tr>
<td>20</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentrate supplement (kg as fed/day)</th>
<th>Early Season</th>
<th>Mid/Late Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4.5</td>
<td>7.5</td>
</tr>
<tr>
<td>4.0</td>
<td>8.5</td>
<td></td>
</tr>
</tbody>
</table>

Overall grazing intake can best be maximised by optimising the quality of the sward, ensuring consistently tall, dense pastures of high digestibility with good intake and palatability characteristics.

**Maximising Sward Quality**

High-yielding cows need leafy swards with an average field cover of at least 3000kg DM/ha (Section 3); tall, dense and easily-consumed grazing from mixed grass/clover leys.

Intake/bite has been shown to be maximised at field covers in the range of 3000-3500kg DM/ha.

However, at these covers it is less likely that good grazing residuals of 1500kg DM/ha will be achieved. Unless good residuals are achieved sward quality will decrease in the subsequent grazing rounds. So it is always a compromise between maximising grass production or cow output. The better the quality and palatability of grass is, the less the compromise.

There are no benefits in providing covers above this level as they will be poorly utilised.

**Fundamental to maintaining this sort of highly productive sward (Section 3) are:**

- Regular assessments of sward growth.
- Grazing at the appropriate pre-graze point.
- Removing cows at the right residual post-graze point – a sward height of 6-8cm for high-yielding cows.

This residual of 6-8cm will be above the generally required residual of 1500kg DM/ha (5cm) for maximum quality grass regrowth for the next grazing round. But with a higher yielding cow achieving this, it may limit her total dry matter intake which will then reduce yield and body condition, so it is a compromise. This will be the cow exceeding 30 litres and in these circumstances corrective sward management measures may need to be taken to regain good residuals, as explained in Section 5 in the section on “Getting grazing back under control”.

The balance between grazing pressure and sward growth needs to be planned carefully and managed flexibly throughout the season in just the same way as with lower yielding stock (Sections 4 and 5) only with more emphasis on cow management.

**A rotational grazing system offers the best way of achieving this critical balance in practice, with allocations adjusted to sward growth on a daily basis.**

It also enables pasture supply to be tailored to the changing nutrient requirement of the cows as they progress through their lactation.
**Key requirements for success in a rotational grazing system are:**

- A good understanding of individual farm sward growth characteristics and sward budgeting
- Cows having access to fresh pasture each day and preferably each feed
- Back-fencing to protect sward re-growth and prevent damage to soil structure
- Adequate water supplies in all grazing areas
- Regular adjustment of grazing rotation length to balance sward supply and demand.

Varying the area closed-up for silage-making is the primary way by which grazing supplies are adjusted.

**Factsheet 14 provides advice on rearing heifers at grass.**

Operating a leader-follower system – in which lower yielders or young stock remove residual herbage after grazing with high-yielding cows – can also be a useful management tool.

One word of caution about the leader-follower system is that the leader (higher yielding cow) will generally consume less grass, potentially just 10kg dry matter and require more concentrate to sustain her yield than the follower (lower yielding cow) who may eat 15kg dry matter of grass and considerably less concentrate.

In this scenario, low yielders “catch up” with highs and may end up short of grazing, yet it’s the lower yielders which should be able to sustain their yields on grazing alone.

An alternate grazing/cutting system or topping early in the season can be valuable to maintain season-long sward quality.

Large herds have more options in grouping cows, allowing earlier spring turnout of moderate yielding in-calf cows with higher yielders put to grass somewhat later.

**Experience shows the operation of two groups of milking cows throughout the grazing season can be achieved without significant increases in workload.**

**Maximising Spring Calver Intakes**

A Kingshay study with cows averaging over 8000 litres and yielding in excess of 30 litres/day has shown the potential for producing milk from grazing with high-yielding spring calving cows (Table 14.2).

**Table 14.2: Milk Production From Grazing**

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>October</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sward DM (%)</td>
<td>21.3</td>
<td>15.3</td>
</tr>
<tr>
<td>Sward intake (kg DM/day)</td>
<td>16.1</td>
<td>13.0</td>
</tr>
<tr>
<td>Production from grazing (M+ litres/day)</td>
<td>24.4</td>
<td>16.6</td>
</tr>
</tbody>
</table>

Source: Kingshay Farming Trust.

The study revealed that M+ over 50% of the daily milk yield of high-yielding cows can be produced from grazing throughout the season.

This was due to the consistently high nutrient quality of the sward – with an ME ranging from 11.3-11.5 MJ/kg DM and protein content of 20-26%.

The study also highlighted the extent to which sward DM is important in determining intakes and production.

Although DM fell towards the end of the season, only in late September, following heavy rain, was it necessary to offer any buffer feed.
A fall in sward DM from 20% to 15% means cows need to consume an additional 25kg of fresh sward for the same daily DM intake (Figure 14.2).

![Figure 14.2: Fresh Sward Intakes Required to Maintain 15kg DM/day Intake](image)

For this reason grazing DM intakes generally reduce as the season progresses or following heavy rain.

Maximising Autumn Calver Intakes

A three year DairyCo study with autumn-calving, high genetic merit cows conducted by AFBI Hillsborough on four contrasting grassland systems (Table 14.3) has shown:

- High-yielding cows milked equally well off a wide range of forage to concentrate ratios
- Milk from forage was almost doubled by using good rather than medium quality silage
- Cows yielding over 8200 litres produced over 70% of their milk (5841 litres) from forage
- Milk from grazing was increased between 650-1100kg per cow with an early turnout, rotational grazing system
- Margins/cow were increased by at least £50/head (5%) with a high milk from forage regime
- Cow fertility was similar regardless of system adopted.

To help with application and understanding of this section please refer to Factsheet 13, The Crichton Star System.
Table 14.3: High Genetic Merit Cow Performance on Differing Grassland Systems

<table>
<thead>
<tr>
<th>System</th>
<th>High Quality Silage*</th>
<th>Medium Quality Silage**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early Turnout Rotational Grazing + No Concentrates</td>
<td>Later Turnout Rigid Paddocks + 4kg/day Concentrates</td>
</tr>
<tr>
<td></td>
<td>Early Turnout Rotational Grazing + No Concentrates</td>
<td>Later Turnout Rigid Paddocks + 4kg/day Concentrates</td>
</tr>
</tbody>
</table>

**Intake/Cow/Lactation**

<table>
<thead>
<tr>
<th></th>
<th>Grazed grass (kg DM)</th>
<th>Silage (kg DM)</th>
<th>Concentrate (kg fresh)</th>
<th>Milk from Forage (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3246</td>
<td>1990</td>
<td>1075</td>
<td>5841</td>
</tr>
<tr>
<td></td>
<td>2416</td>
<td>2062</td>
<td>1636</td>
<td>4774</td>
</tr>
<tr>
<td></td>
<td>3075</td>
<td>1114</td>
<td>2198</td>
<td>3068</td>
</tr>
<tr>
<td></td>
<td>2447</td>
<td>1152</td>
<td>2650</td>
<td>2318</td>
</tr>
</tbody>
</table>

**Milk Production/Cow/Lactation**

<table>
<thead>
<tr>
<th></th>
<th>Milk yield (kg)</th>
<th>Fat (%)</th>
<th>Protein (%)</th>
<th>Milk from Forage (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8230</td>
<td>4.07</td>
<td>3.32</td>
<td>5841</td>
</tr>
<tr>
<td></td>
<td>8412</td>
<td>4.01</td>
<td>3.33</td>
<td>4774</td>
</tr>
<tr>
<td></td>
<td>7950</td>
<td>4.13</td>
<td>3.44</td>
<td>3068</td>
</tr>
<tr>
<td></td>
<td>8209</td>
<td>4.11</td>
<td>3.47</td>
<td>2318</td>
</tr>
</tbody>
</table>

**Gross Margins**

<table>
<thead>
<tr>
<th></th>
<th>£/cow</th>
<th>£/1000 litres</th>
<th>£/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1024</td>
<td>124</td>
<td>2356</td>
</tr>
<tr>
<td></td>
<td>975</td>
<td>116</td>
<td>2535</td>
</tr>
<tr>
<td></td>
<td>961</td>
<td>121</td>
<td>2788</td>
</tr>
<tr>
<td></td>
<td>956</td>
<td>116</td>
<td>3155***</td>
</tr>
</tbody>
</table>

* High quality grass silage with a flat rate of 6kg concentrates/head/day during the winter, followed by contrasting grazing and summer concentrate feeding regimes.

** Medium quality, direct cut silage fed with a concentrate allocation of 13kg/head per day during the winter as a complete diet, followed by the same contrasting summer regimes.

*** In NVZs the nitrogen load generated by this regime may be excessive.

Source: DairyCo Research Report: A three year comparison of four contrasting production systems with winter calving HGM cows in a grass/silage environment.
Optimising Sward Allocations

Cows giving 25 litres/day or more at turnout should receive higher sward allocations than lower yielders in order to achieve the higher sward intakes required (Table 14.4).

Table 14.4.: Sward Allocations for High-yielding Cows

<table>
<thead>
<tr>
<th>Yield Level (litres/cow/day)</th>
<th>Sward Allowance (kg DM/cow/day)</th>
<th>Target DM intake (kg DM/cow/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring/Early Summer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td>Late Summer/Autumn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

By spring many autumn-calving high-yielding cows will be producing around 25 litres and can be turned out safely in-calf to achieve the majority of their milk from grazing with minimal concentrate use.

What is a High Performing Herd at Grazing?

Is it?

- A herd achieving 9000+ litres and peaking at 40-50 litres a cow?
- The same herd, but 180 days post-calving, in-calf and yielding 30 litres a cow?
- A 4500 to 6000 litre herd predominantly taking it from grass?

The answer is all of these, but each scenario may need different management to maximise cow potential.

Case Studies

These snapshot examples show how these animals are managed on potentially the cheapest feed for a dairy cow – grazed grass – using the basic principle of rotational grazing to deliver top quality grass and high growth rates.

1. David Homer, Marlborough, Wiltshire. 150 cows, 9500 litres, grazing and fed a total mixed ration (TMR).

David’s herd is split into two groups, highs and lows, during the grazing season. He has also been consciously extending the grazing season over the last few years. Splitting the herd allows high-yielders to go out during the day on good grazing and in at night on a TMR.

David, assisted by herdsman James, measures grass weekly using a plate meter. Cows are then allocated a fresh, measured area for each grazing, so they receive the exact amount of grass David requires – using movable electric fences.

The Lows
This group consists of 50 to 75 cows all in-calf averaging 27-28 litres per day (with a range of 21 to 35 litres).

In May they are allocated 6kg DM/head of grazing during the day and 8kg DM/head at night. In addition, they are fed a TMR pre-afternoon milking inside of 3.5kg DM of blend (sugar beet, caustic wheat, soya, rape and minerals), 1kg DM of maize silage and 0.4kg DM of grass silage.

Added to grazing, this gives a total dry matter intake of 19kg DM/head/day to produce 28 litres/cow. Achieving this intake requires cows to go into a grass cover of 2700kg DM/ha.

James has tried challenging this group to see what they could achieve off grass, by increasing grazing to 17kg DM with only 2.5kg DM of TMR inside. But he found they dropped to a 25 litre average and, more importantly, he also noticed a slight condition loss, so reverted back to 14kg DM of grazing and 6kg DM of the TMR. TMR was decreased a little again as the grazing season progressed.

Wet weather in the summer saw James increase the TMR to up to 8kg of DM on very wet days, split into am and pm feeds on a sacrifice paddock with grazing decreased to 12-13kg of DM. Plus leaving a higher post-grazing residual cover of 1800-1900kg DM/ha, compared with 1500kg DM/ha in dry weather.

**Putting the system into practice:**
- Flexibility in grass allocation is needed
- Challenge your perceptions of what is possible from grazing
- Remove some TMR to see what cows can achieve incorporating grazing into a TMR is as easy as altering any component of the ration in the winter.

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**The Highs**

This group consists of about 86 cows, of which 60% are in-calf and others being served. They average 44-45 litres per day (with a range of 36 to 70 litres).

This group goes out to graze after milking at 7am and is brought in again at 1pm. In this time, they are allocated 7 to 8kg DM/head of grass. Inside they are fed a TMR, including 9.6kg DM of blend, 3.6kg DM of grass silage, 3.9kg DM of maize silage and 0.4kg DM of straw totalling 16.3kg DM. Added to the grazing, this gives a dry matter intake of 23-24kg DM/day.

To graze well, cows should not be fed inside prior to going out as the cow needs to have an “edge” to her appetite, without being very hungry. David achieves that “edge” by making sure cows clear their troughs by 5 to 5.30am.

This “edge” is helped by milking which switches on the cow’s hormones to make her want to eat and drink post-milking.

She will graze hard for one and a half hours before taking a rest and then graze again later in the morning.

These cows were also challenged to eat more grass. They were left out until 3.30pm and milk yields stayed the same, but cows lost a little condition so were brought in at 1pm again.
The benefits to this business of grazing their high-yielding Holsteins are:

- Reduction in feed costs
- Less slurry and muck handling
- Savings on bedding costs
- Exercise for cows with no yield penalties.

To achieve this they needed:

- A plate meter
- A couple of rolls of electric fencing wire
- A willingness to challenge themselves and their cows, even when going against the views of others
- Flexibility
- A desire for greater profit.

2. Chris Falconer, Abbotsham, Devon.

A different system to David Homer’s, but also maximising the use of grazed grass, is that run by Chris Falconer. His cows are achieving lower overall yields, but a far greater proportion of their physiological needs for maintenance and yield comes from grazed grass and thus he is achieving high cow performance from grazing.

Chris runs two organic herds, spring and autumn calving, producing a level supply to fill a cheese contract.

Spring calving herd

350 Jerseys and Jersey crossbreds are expected to reach a yield of 21 litres from grazed grass in mid June, at 5.2% fat and 3.8% protein. At a standard litre of 4% fat and 3.25% protein, this would equate to 26 litres from grazed grass. Annual yields are 4200 to 4500 litres, with the variation down to grass growth in the spring. Of this yield approximately 3700 litres would be from grass. Concentrate usage is 400 – 600kg annually, depending on grass growth.

A Kiwi Jersey in the spring calving herd.

Calving from early February to mid April, the spring calvers are allocated less than 2t/head fresh weight of good quality grass silage and less than 1t fresh weight of whole-crop to supplement grass annually.

In really awful weather they yield 10 litres from grass in early lactation but in good conditions this will be up to 21 litres of high constituent Jersey milk.

Autumn calving herd

300 black and whites and crossbreds, with no Jerseys. Chris wants a bigger animal for autumn calving than spring calving, for greater intakes of conserved forage in winter. Over time the black and whites will be phased out until the entire herd is crossbred.

The autumn herd calves late July to mid September outside to reduce mastitis and bedding costs. This herd currently achieves 5500 litres on 0.7t of concentrate with approximately 4200 litres from forage and grass, but the yield level is milk price dependent and this milk is up to 4.5% fat and 3.5% protein. If the milk price supports it, Chris may feed more concentrate to increase this yield to a maximum of 6000 litres. Chris does not think it will do cows any good to push them further.

The winter feeding regime consists of 0.7t of concentrate and good forage, including whole crop peas, barley and red clover. Peak yield is 28 litres, 20 litres coming from forage and 8 litres from concentrate.
These figures show a low reliance on concentrate and excellent production from grazing.

Concentrate level is dictated by cow condition score; as soon as condition score declines or is not improving as expected, it is increased. Condition score follows grass condition and when grass quality reduces, concentrate is increased and conversely when grass quality and condition score is good, concentrate is cut.

The grass and its conversion into milk is the driver, not the yield, as grazing is the cheapest feed in this system.

By March, grazing quality and quantity is increasing and concentrate levels are reduced along with buffer forage. In 2007, yield went up from 25 to 26.5 litres immediately. This is not all down to feeding, says Chris, part of it is due to cows being happier grazing rather than standing on concrete.

**Points applicable to both herds**

- When really challenged, the grazing cow’s incidence of sub-clinical lameness can be revealed. If so, this needs to be sorted out immediately, as the cow will lose condition quickly when lame

- Chris believes milk fat and protein levels at grass only tell you what has happened historically, so it’s too late for a reaction to correct it. He watches cow condition and consistency of dung. A useful indicator is that when cow’s dung is extremely loose, they are receiving too much protein and thus diet needs to be altered accordingly

- Linked to this is variation in grass. When there is silage aftermath, reseeds and old grass leys available in the rotation, these are mixed up so cows do not spend a week on aftermaths and then go on to old pasture, as this sudden change can upset rumen stability

- Chris will not feed for fat and protein as there is too little in the budget for extra feed on this objective alone and good milk quality can be achieved from good grazing and cow condition

- Budgeting yield from grazing means looking at grass every day, to maximise what is in front of you each day. Grass covers are measured by plate meter. At the end of the year, Chris reviews comparative stocking rate, total grass used and output.

**Important points of the system:**

- Manage what is in front of cows everyday

- The calendar has been thrown away, as it can be restrictive

- Infrastructure of tracks is essential

- Act on cow condition changes immediately, by altering concentrate fed

- Cow fertility at grass is dependent on body condition, so cows are tail-painted and bulls are watched to ensure they are working

- Manage what is in front of you; if the weather is horrible add some feed

- Fields of different sizes do not matter, as the area allocated each day is different depending on growth, cow numbers and season

- When there is not quite enough feed in the field, a little buffer for that day may be added to provide the intake required

- When it rains heavily, feed is increased to maintain intake, first with concentrate and then forage, as concentrate increases dry matter intake and is easy to offer and minimises grass substitution

- Clover is a major part of the system, as a supplier of nitrogen and a diet balancer because it supplies feed protein

- Bloat is not a problem with white clover (red clover is different)

- Fertiliser, including muck and slurry, is important and on any given day look at the grazing and see if it needs any help

- Chris believes to get cows to graze really well, they must learn how and this starts when they are calves and heifers.
Supplement choice

Correct supplementation of high-yielding cows is essential to optimise feed intake while maximising the contribution from by far the cheapest feed on-farm – grazed grass.

Supplements should only be given to support yields in excess of those achievable from grazing or at times of grazing shortage.

Buffer forages should only be fed when grass is in short supply as these feeds can almost entirely substitute for higher nutrient content grass in the diet.

If buffer forages are to be fed they should be confined to a limited period around milking time or to cows housed overnight rather than presented in the grazing field (Section 6).

A flexible approach to buffer feeding when grazing can optimise sward intake while ensuring cow performance is maintained.

Buffer feeds should, for instance, be provided on wet days when swards may have a low DM, but removed as soon as conditions improve.

Optimising Concentrate Supplementation

Supplementation of high-yielding cows at grass should be designed to ensure they have an adequate supply of energy to support milk yield and maintain body condition.

Some work carried out at SAC suggested that fibrous concentrates (e.g., molassed sugar beet pulp) may give lower substitution rates than starchy type concentrates at grass. However, it depends on the quality of the grass as much as anything and there might be an argument for feeding fibrous concentrates with good quality grass and starchy ones with low quality grass, but the results were not very consistent.

Evidence from Ireland indicates that the rate at which concentrates substitute for forage at grazing is lower in high-yielding cows than in lower yielders, and lower than originally believed when concentrates are fed at grass.

Moorepark research shows a reduction of 0.2-0.5kg in grass intake for every kilogram of concentrate offered at a planned concentrate allocation of 500kg/cow.

The best responses to concentrate-feeding were seen in late summer/autumn and the least good in spring.

For high-yielding cows concentrates are generally the best form of supplementation because they displace less grass from the diet than bulkier feeds (Section 6).
The protein level of concentrate at grazing should be in the region of 16-18% and definitely no higher than 18%, but some systems with very high quality grazing may be able to reduce concentrate protein down to 14%.

It has been suggested by some that concentrate fed at grazing should be done on a feed-to-yield basis, but feed-to-yield can lead to very high substitution rates at grass and decline in grass utilisation from grazing. If you are going for very high yields then you’ll have to feed a lot of concentrates at grass anyway and your approach to grazing should accordingly be: keep it tight, but ease off on pushing grazing intakes. If you are on low or medium yields, then feed no or lowest possible flat rate and push the grazing to get the most from cheap grass.

Where is this cut off between high and medium, low yielder? This varies but a starting guide is any cow doing 30 plus litres will be a high yielder and would require extensive supplementary feeding whereas a cow below 25 litres is a cow to be pushed on grazing. See previous example of David Homer.

Higher levels of concentrates should be targeted towards higher yielding cows, with little or none allocated to cows yielding below 25kg/head/day.

Benchmark figures on the potential milk production from high quality forage for cows yielding up to 40 litres/day indicate the greatest requirement for concentrate supplementation is likely to be in March, September and October (Figure 14.3).

A substantial proportion of milk can be produced from grazing in both the spring and autumn-calving cow by providing high quality swards with good intake characteristics and appropriate targeting of concentrate supplementation.

Achieving more milk from grazing in this way can reduce overall feeding costs by around 1.6p/litre (Example 14.1). This improvement can be achieved without any detrimental effect on milk quality.

In addition to feed saving, reductions in silage and housing costs can also be expected.
Example 14.1: Valuing Milk from Grazing in High-yielding Herds

<table>
<thead>
<tr>
<th>Non-Organic Holstein Friesian Herds 8,000 to 9,000 Litre Herds</th>
<th>8,000 to 9,000 Litre Herds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top 25% Highest Yield from Grazing</td>
</tr>
<tr>
<td>Milk Production</td>
<td></td>
</tr>
<tr>
<td>Yield (litres/cow)</td>
<td>8,408</td>
</tr>
<tr>
<td>Yield from forage (litres/cow)</td>
<td>3,579</td>
</tr>
<tr>
<td>Yield from forage (%)</td>
<td>43</td>
</tr>
<tr>
<td>Yield from grazing (litres/cow)</td>
<td>2,076</td>
</tr>
<tr>
<td>Milk Quality</td>
<td></td>
</tr>
<tr>
<td>Butterfat (%)</td>
<td>4.18</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>3.38</td>
</tr>
<tr>
<td>Bactoscan</td>
<td>25</td>
</tr>
<tr>
<td>Cell Count (thousand/ml)</td>
<td>165</td>
</tr>
<tr>
<td>Feed Use</td>
<td></td>
</tr>
<tr>
<td>Concentrates (kg/cow)</td>
<td>2,201</td>
</tr>
<tr>
<td>Concentrates (kg/litre)</td>
<td>0.26</td>
</tr>
<tr>
<td>All purchased feed cost (p/litre)</td>
<td>4.56</td>
</tr>
</tbody>
</table>

Source: Kingshay Dairy Manager (April 2008).

Worksheet 16 provides a pro forma for individual milk from grazing record-keeping.
Summary

- High-yielding cows will consume 1-2kg more forage DM/day at grass providing the swards allow them to do so.
- Leafy swards with an average field cover of at least 3000kg DM/ha are recommended for high-yielding cows. But beware grazing residuals.
- Under good grazing conditions the top quartile of herds should achieve around 15 DM/head/day, capable of supporting up to 25 litres of milk.
- A rotational grazing system is the best way of maximising sward intakes by maintaining season-long sward quality.
- Grazing intakes generally reduce as the season progresses and following heavy rain.
- Concentrates are the best form of supplementation when grass supplies are adequate and should be fed according to yield to support cows producing in excess of 25 litres/day.
- The amount of concentrate fed is more important than the type of energy it provides.
- There is little response to increasing concentrate protein levels beyond around 16-18% when adequate supplies of good quality grazing are available.
- High-yielding cow fertility need not be compromised by maximising milk from well-managed grazing.

See also...

| Section 3: | Assessing Your Pasture |
| Section 4: | Planning Your Grazing |
| Section 5: | Managing Your Grazing |
| Section 6: | Supplementing Grazing |
| Section 15: | Factsheet 13: The Crichton Star System |
| Section 15: | Factsheet 14: Rearing Heifers at Grass |
| Section 16: | Worksheet 16: Milk from Grazing |