BETTERRETURNS

Planning grazing strategies for Better Returns

Manual 8

BEEF & LAMB

Contents

The information in this booklet was compiled by Dr Liz Genever (AHDB Beef & Lamb) and Sue Buckingham (Forward Thinking Farming).

The Better Returns Programme is grateful to all those who have commented on and contributed to this publication.

Photography: Charlie Morgan (GrassMaster) and Germinal

Introduction

Grass is an important crop and can provide 85–95 per cent of the energy requirements of beef and sheep systems. Yet, it rarely earns the respect it deserves as a potentially high-quality, natural ruminant feed. Half of what is grown is commonly wasted.

Grazed grass is the cheapest feed on the farm. When managed well it has the potential to reduce input costs significantly, in particular, of bought-in feed. Some farmers finish lambs and cattle purely off pasture and conserved forages. This can save money and, in some cases, earn a premium.

Whether the system is high-input or based around environmental grazing, the message is the same: understand supply and demand.

The first step to greater utilisation is to understand how grass grows and to start measuring how much is available in the fields and how fast it is growing.

It is then possible to balance feed supply with demand and make informed decisions on stocking levels and future management.

There is no doubt that optimising production from grazed grass requires focus and commitment but the returns, both in production and profit, will more than justify the effort.

This manual will help farmers develop more efficient grazing strategies that will earn better returns for their business.

Dr Liz Genever
AHDB Beef & Lamb Senior Scientist

How does grass grow?

Most grasses have evolved to withstand grazing by having growing points at or near ground level that quickly respond to defoliation.

Perennial ryegrass, the UK's most commonly sown species, only ever has three live leaves on each individual plant (tiller). As the fourth leaf starts to grow, the first and the oldest leaf dies. When grass growth is at its highest, usually in May, a new leaf is produced every four to five days.

At peak growth, all three leaves can be replaced within two to three weeks, but in mid-winter, when grass growth is at its slowest, it can take 30 days to produce one new leaf.

The best time for grazing is when the plant is at the 2.5–3 leaf stage.

Grass growth varies

A range of factors influence the amount of grass that grows, including grass species, soil temperature, light, water, nutrient availability and grazing management. Table 1 suggests a typical pattern of grass growth that may be seen in England under moderate nitrogen use, but it will differ from field to field and from year to year.

The values in the table are in kilograms of dry matter per hectare per day (kg DM/ha per day). This is the most common way of expressing grass growth and is a measure of how much grass has grown in one hectare in one day. It takes into account differences in the water content at different times of the year.

Understanding the range in grass growth that is expected at different times of the year, eg 45kg DM/ha per day in May compared to 5kg DM/ha per day in February, is really useful to help match grass supply with livestock feed requirements. See page 16 for more information.

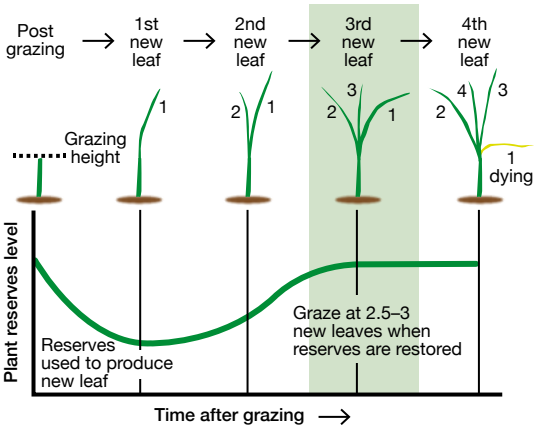


Figure 1. The leaf life cycle of a grass plant

Table 1. A guide to typical monthly grass growth in England

Month	Average	Min.	Max.
	(kg DM/ha per day)		
January	0	0	10
February	5	0	10
March	10	0	20
April	25	10	40
May	45	20	60
June	30	20	50
July	20	15	40
August	30	20	50
September	20	10	40
October	15	5	30
November	10	0	20
December	5	0	10

Note: Grass growth may exceed these values at good sites or during very favourable periods

Factors affecting grass growth

Soil temperature

Grass growth starts when soil at a depth of 10cm reaches 5°C for five consecutive days. There is variation between grasses, for example, timothy may start growing at lower temperatures. White clover and other legumes begin to grow at around 8°C. The plant becomes active and absorbs soil moisture, which increases nutrient uptake and growth rate.

Grass starts growing later in damaged or compacted soils because they have greater moisture content, making them colder.

Measuring soil temperature using a soil thermometer is a quick, easy and cheap method of identifying when the plant is actively growing so that nitrogen (N) fertiliser can be applied to promote growth.

Altitude and aspect

Air temperature drops by 1°C for every 100m rise above sea level. This affects grass growth, particularly the length of the growing season. North-facing pastures take longer to warm up in spring than south-facing ones.

Light

Light is required for photosynthesis, which provides the plant with energy for growth.

Day length

Increasing day length stimulates the flowering process and seed head production, which limits leaf growth. The aim of good grazing is to prevent seed head production, keeping the grass plants young and leafy.

Water

Grass leaves will wilt without water, meaning they cannot maintain the optimum position for light capture and nutrients cannot be transported inside the plant.

With too much water, a plant will slow or even shut down its root activity, which has similar effects to drought. Leaves wilt and growth declines because of a lack of water and poor nutrient uptake. Root rot can occur.

Nitrogen (from clover, fertiliser or manures)

The faster leaves grow, the more light they intercept. In young, leafy swards, N can increase sward yield and density, building tiller numbers and enhancing the plant's ability to use other nutrients. In grazing systems, N is most effective at sward heights of 4–8cm (1,500–2,000kg DM/ha). If it is applied to mature grass it can reduce tiller density and nutrient use efficiency (NUE).

Phosphate and potash indices

Phosphate and potash are essential for grass and clover growth. Phosphate is important for root development and energy transfer within plants, while potash has a key role in water regulation and NUE.

Target indices for optimum growth are 2 for phosphate and 2- for potash. If indices fall below target levels, grass yields will decline regardless of other nutrient supplies.

Grass type

Different grass species and varieties have different characteristics in terms of total yield and timing of growth, which can be exploited to suit a grazing system. Information on yield, feed quality, disease, seasonal growth patterns and persistence can be found in the **Recommended Grass and Clover Lists**.

Grazing management

When grass is grazed at the ideal 2.5–3 leaf stage, it increases grass growth and yield by maintaining the optimum leaf area to capture sunlight. Grazing too low, ie below the two-leaf stage, can reduce grass growth by up to 85 per cent.

Grass growth and death

In a grass sward, there is always a balance between grass growth and death.

Figure 2 shows that the optimum daily grass growth is reached when total growth is 2,000–2,500kg DM/ha, which equates to a height of around 8–12cm.

Beyond this, dying leaves deprive new leaves of sunlight, leading to increased leaf death and a decline in overall production.

Grazing at the ideal point and resting swards when total grass growth falls below 1,250–1,500kg DM/ha (3–4cm) can improve grass utilisation, sustain sward quality and optimise performance.

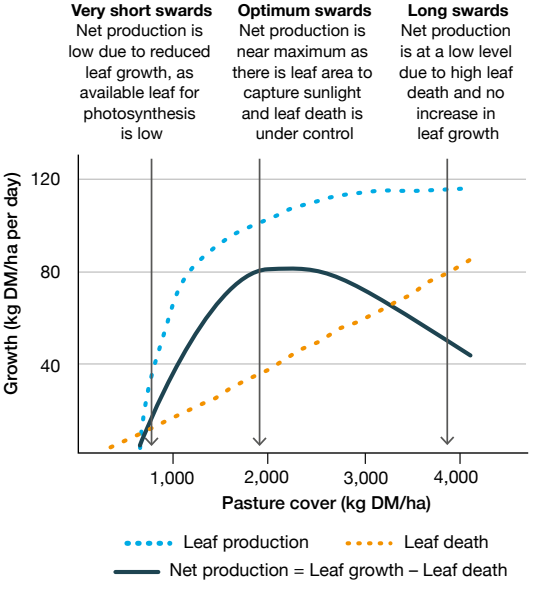


Figure 2. Grass production at different growth rates

Utilisation

Utilisation of grazed grass is often below 50 per cent, but can be as high as 80 per cent with good management. There is little point in growing as much grass as possible unless it is utilised. Good utilisation happens when fields are grazed at the right time, to the right height, with the right amount of stock.

The aim of good grazing management is to prevent plants from getting to the fourth leaf stage and dying. This reduces wastage and the build-up of unproductive dead leaves at the base of the sward. Dead material uses N to rot down, can limit grass and clover growth by shading out the growing points and plays host to pests and diseases.

Grazing management is affected by:

- Previous grazing – under-grazing may have allowed grass to become mature and unattractive to stock, while over-grazing reduces grass growth
- Sward composition – animals may avoid grazing weeds
- Dung and urine areas – are often avoided by grazing livestock
- Grazing system (see Table 2)

Table 2. A guide to expected utilisation according to different grazing systems

Grazing system	Expected utilisation (%)
Set stocking, limited control over sward heights, grazing large areas for long periods, wet conditions	50
Continuous grazing or relaxed rotational grazing, limited control over sward heights, grazing picky stock, eg finishing lambs or stock that should not have limited intake	60
Rotational grazing, reasonable grazing pressure, good control over sward height	65
Paddock grazing, frequent moves, good control over sward height	80

Measuring swards

Matching livestock needs to grass availability is key to optimising output per animal and per hectare. There are many reliable ways to measure the amount of grass available, including sward height in centimetres and weight per hectare in kilograms of dry matter, also known as pasture cover.

Sward height targets have been generated from research and are based on what is ideal for the plant and the animal. Targets vary over the season because of the pattern of grass growth (see Table 3).

Targets are higher for cattle because they need to wrap their tongues around the grass to feed, while sheep nibble it.

Anything can be used to measure sward heights, a ruler, a sward stick or marks on the side of a wellington boot. The key is to understand how the amount of available grass changes from week to week.

Adjusting the grazing area, either by closing or opening up fields, or part fields, is a useful step to improve utilisation. See pages 28 and 29 for more guidance.

Measuring sward heights

- Walk each field in a 'W' pattern – avoid unrepresentative areas, eg gateways
- Place the sward stick vertically into the grass, just touching the ground
- Slide a thumb down to the point at which the highest grass/clover leaf touches the stick
- Take around 30 measurements per field (ignore stems, flowers or weeds)
- Calculate the field averages and record
- Record the data to monitor changes over the season

Table 3. Sward height targets for cattle and sheep

Class of stock	Grazing period	Rotational grazing		Continuous grazing (cm)
		Pre-graze (cm)	Post-graze/residual (cm)	
Ewes and lambs	Turn-out–May May–weaning	8–10 8–10	4–5 4–6	4 4–6
Pre-tupping	Sep–Nov	8–10	4–5	6–8
Weaned finishing lamb	Jul–Sep	10–12	5–7	6–8
Cows and calves	Turn-out–May Jun–Jul Aug–Nov	10–14 12–15 12–15	5–6 7–8 8–9	5–6 7–9 7–9
Growing or finishing cattle	Turn-out–May Jun–Jul Aug–Nov	10–12 10–14 10–15	5–6 6–7 7–8	5–6 6–7 7–8

Pasture cover

A plate meter or a compressed sward stick that relates compressed sward height back to kg DM/ha can be used to assess the pasture cover in a field. Both can take sward height, density, sward maturity and season into account.

Measuring pasture cover provides useful information for feed budgeting and rotation planning to optimise grazing management.

Plate meter

The plate meter is placed squarely on the sward. The grass holds up the plate while the metal pole drops down to the ground measuring the compressed height of the sward in centimetres. This is converted to kg DM/ha with a calibration equation.

A default calibration equation is usually used in the UK. This is average compressed sward height (cm) x 140 + 500. The 'multiplier' of 140 in the equation reflects the DM per centimetre of the compressed sward height. The 'adder' of 500 in the equation is to compensate for the amount of grass at the bottom of the sward not measured by the plate meter.

Compressed sward stick

The AHDB compressed sward stick is used either with the hand or with a clipboard that acts like the plate of a plate meter. Readings can be adjusted for 'season', taking into account the quality of the sward. Five 'seasons' are used (see Table 4).

When using a compressed sward stick, choose the appropriate 'season', place a hand or a clipboard on the grass and apply gentle pressure. Set the stick vertically, read off the corresponding pasture cover (kg DM/ha) from the correct season and record the result. Take up to 30 measurements, unless the first five measurements show a similar pasture cover.

A video explaining how to use the AHDB compressed sward stick is available on the AHDB Beef & Lamb YouTube channel, **Beef & Lamb TV**.

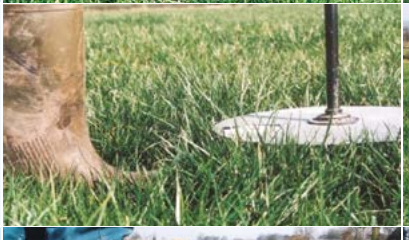
Table 4. The five ‘seasons’ on the AHDB compressed stick with sward descriptions

Spring	Early spring	Summer	Autumn	Winter
Leafy No seed heads Clover building Low dry matter	Generally leafy Some seed heads Moderate clover	Some dead grass Many seed heads Abundant clover High dry matter	Dead grass Green leaf	No dead grass Little clover

Source: Farmax

Assessing kg DM/ha

The pictures below give a rough guide to pasture cover. Visual assessment is best when it is backed up by measuring with a compressed sward stick or plate meter, or by cutting and weighing (see page 15).

Pasture cover – kg DM/ha		
1,500 (4–5cm sward height)		
2,000		
2,500 (leaves are starting to bend over)		
3,000		

Common grazing strategies

There are many ways to achieve sward height or pasture cover targets. One strategy does not fit every farm and there is always a need to be flexible, depending on the year. It may be that continuous grazing is practised early in the year, then growing animals are grazed using a paddock system.

Optimising production from grassland is a balance between utilisation, yield and management input.

Is the hassle of moving fences and updating infrastructure worth it?

Generally, with a strategy that gives the grass a rest, eg moving stock to another field, the yield will go up by around 20 per cent. If grazing pressure is then tightened by erecting temporary fences, utilisation will increase.

More information on fencing options can be found online in the BRP+ document **Electric Fencing for Livestock**.

The example in Table 5 suggests that moving from set stocking to paddock grazing can almost double grass yield.

If the cost of buying in an extra 3.9t DM/ha of feed is compared with buying some fencing and troughs that will last five years or more, the answer is yes.

Research carried out in Ireland has shown that every hour spent on grassland management, whether moving fences or troughs or measuring grass, is worth €100 (£85).

Worm control and grazing

Grazing management can reduce dependence on wormers and flukicides, but requires significant planning. Parasite burdens can be reduced by grazing with other classes of stock, using the fields for conservation, or grazing new reseeds after a forage or arable crop.

Sheep

Fields most at risk are those in which sheep or goats were grazed in the previous year or earlier in the season. The risk reduces to a medium level if only adult non-lactating sheep were grazing the year before, or if hay or silage was taken from that field in the previous year. Grazing with cattle in the previous year or earlier in the season also reduces the risk to medium.

Cattle

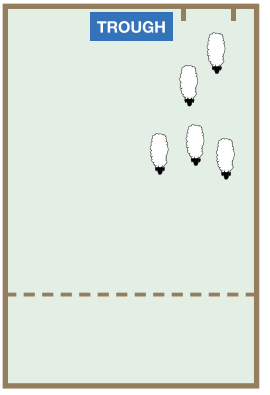
Land grazed by cattle the year before is generally of high risk, while having sheep in the system reduces the risk. The objective is to dilute the number of worms that affect cattle with sheep worms and vice versa.

See Sustainable Worm Control Strategies for Sheep (SCOPS) at **www.scops.org.uk** and Control of Worms Sustainably (COWS) at **www.cattleparasites.org.uk** for more details.

Table 5. Effect of moving from set stocking to paddock grazing

Strategy	Annual yield (t DM/ha)	Utilisation (%)	Useable yield (t DM/ha)	Percentage increase (%)
Set stocking	6.0	50	4.3	
Continuous (variable)	8.5	60	5.1	20
Rotational	10.2	65	6.6	56
Paddock	10.2	80	8.2	92

Continuous (variable) grazing



Stock can graze a particular area throughout the season and, generally, no fields are left ungrazed for more than a few days. However, areas can be closed up to control sward quality if sward height or cover exceeds targets.

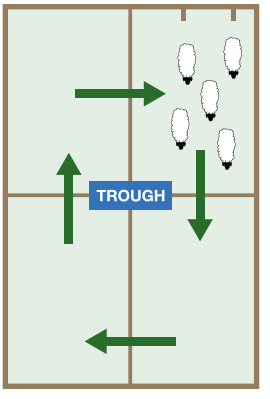
Pros

- Low management input
- Low capital costs
- Can work well if sward height targets are maintained

Cons

- Lower forage yield
- Can be difficult to maintain grass quality and even sward height
- Uneven manure distribution
- Lower utilisation caused by trampling
- Weeds can build up

Rotational grazing



Stock is moved around a small number of fields based on sward height or pasture cover targets, or after a certain number of days.

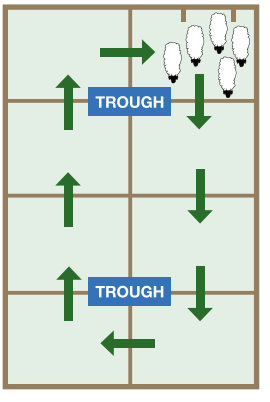
Pros

- Higher productivity than continuous grazing
- Allows the pasture to rest and regrow
- Can extend the grazing season
- More even manure distribution

Cons

- More fencing required and water provision increases cost
- Forage production and pasture utilisation is suboptimal

Paddock grazing



Stock is moved frequently through a series of paddocks based on measured grazing heights or pasture covers.

Pros

- Highest forage production and use per hectare
- Provides very high-quality feed: 11–12MJ of metabolisable energy (ME)
- Higher stocking rates can be sustained
- More even manure distribution
- Weeds can be controlled through grazing
- Reduced need for conserved forage by extending the grazing season

Cons

- Requires careful monitoring of forage supply
- Initial costs of fencing and water provision may be high
- More intensive management required

Other management options

Deferred grazing

Deferred grazing is where stock is removed from a field to build up a supply of grass, which can then be fed later in the year by strip or block grazing to ensure good utilisation. A back fence is used to keep the stock off the previously grazed areas to allow recovery.

This system avoids the costs of having to turn that area of grass into silage or hay and then feeding it. It is best suited to free-draining fields located well away from water courses.

If the grass is being grazed in the spring, the earlier the closing date in autumn, the higher the yield of grass will be.

In trials, a 40 per cent reduction in DM yield per hectare was achieved when stock was excluded on 20 September, compared to 30 August. This was caused by the reducing day length and lower temperatures, which limit growth after mid-September. However, compared to the field closed in September, the quality of the grazing in the field that was shut up in August was poorer, with 25 per cent more dead material in the sward at the beginning of March.

All grass wintering (AGW)

AGW is a form of paddock grazing that meets the nutritional requirements of pregnant ewes during winter, mainly from grass.

The grazing rotation starts approximately three weeks after tupping and lasts until three weeks before lambing. Pastures to be grazed immediately after lambing are grazed first, giving them sufficient time to recover before spring.

In good grass growing areas, where ewes can be sustained on grass only, it has been shown to offer potential savings of £15 per ewe per winter.

Key requirements:

- Suitable breeds of sheep
- Well-drained soils
- Sufficient winter grass growth
- Feed budgeting to check there is enough grass
- Close monitoring of ewe health and field conditions and flexibility to adapt to changing conditions
- Emergency forage reserves to cope with any adverse weather

Investment in infrastructure may be needed, eg electric fencing, additional water troughs and field access.

For further information on AGW see the BRP+ document **All Grass Wintering of Sheep** at **beefandlamb.ahdb.org.uk**

Topping

Topping or mowing grass after grazing can be a legitimate way to manage grass quality if done correctly. Using a mower rather than a topper may also be beneficial as it leaves a cleaner cut for the plant to regrow.

Topping/mowing should be done at 4cm to re-set the field for regrowth. Topping is mostly a cosmetic exercise to tidy up fields and seed heads in late season. While this will have a beneficial effect on pasture regrowth for late summer and autumn, the main point of topping is to prevent grass from heading in the first place. Once a grass plant has headed it has fulfilled its purpose for the

year and will not grow any more. Therefore, consider topping a few weeks earlier than you normally would.

Mob grazing

Mob grazing, also known as intensive rotational grazing or cell grazing, describes a system in which a large number of animals graze a tight area of pasture and are moved on a daily basis to graze different areas in rotation. The area that livestock have moved off from is then back-fenced and left for a good amount of time to allow regrowth.

This intensive system encourages animals to graze the sward evenly, consuming the nutritious top portion and trampling down lower stems, which return nutrients to the soil. Regulated grazing helps to maintain diversity within the sward.

This system, popular in the US, mimics the natural grazing patterns of migratory herding animals and is increasingly practised in the UK.

Mowing pre-grazing

As an alternative to topping many farmers mow the grass before grazing, especially with cattle. This has the same effect of re-setting the field for regrowth, but also allows the stock to eat the cut grass, which is normally wilted for a day before letting the stock in. Topped grass post-grazing can also often lie and rot on the surface, preventing light from getting to the sward and affecting the regrowth. Pre-mowing is useful where the grass is 'getting away' but there is insufficient yield to justify the cost of making silage, or if the field will be required for grazing immediately in the next rotation.

Another variation is to mow or top the grass while the livestock are in the field, on the last day before they are moved to fresh grass. This might suit some farms better than mowing pre-grazing.

TechnoGrazing™

TechnoGrazing™ is a cell-based, rotational grazing system that was developed in New Zealand in 1987. This innovative method of grazing has since been adopted in Australia and North and South America. TechnoGrazing™ systems use semi-permanent, flexible electric fences to construct lanes and cells designed to provide easily adjustable rotation lengths while ensuring that animal movements are time-efficient.

AHDB funded a project to investigate the potential of TechnoGrazing™ in the UK. Three farms on the Cornwall/Devon border had TechnoGrazing™ systems installed, with set-up costs varying between £276 and £420/ha, including design, equipment, installation and training.

In this trial, TechnoGrazing™ substantially increased the production from pasture compared to the equivalent average figures from **AHDB Stocktake 2016**. It also reduced the £/kg liveweight gain compared to the trial participant's current production systems by decreasing the cost per head, including eliminating concentrate usage at pasture.

Pasture composition and tiller density were improved and poaching or surface water run-off minimised. Animals showed high contentment and responded with good growth rates.

Stocking rates

Stocking rates are the traditional way of calculating the appropriate number of animals needed to graze on a farm.

Stocking decisions are usually based on management priorities and land use restrictions. Rates should be adjusted according to land grade, nutrient use, any environmental stewardship agreements and grazing quality.

It is actually easier to plan grazing strategies using measured grass supply and demand, but stocking rate can be useful at a farm level, or to compare different pieces of land.

High stocking rate
2–2.5 livestock units/ha
(0.8–1LU/acre)

Low stocking rate
1–1.5 livestock units/ha
(0.4–0.6LU/acre)

High stocking rates can achieve higher utilisation and make it easier to maintain pasture quality. With low stocking rates it is easier to achieve higher gain per head, providing pasture quality is good.

Liveweight per hectare

Another way to assess grassland productivity is to see how many kilograms of liveweight each hectare will support throughout the season (see Figure 3).

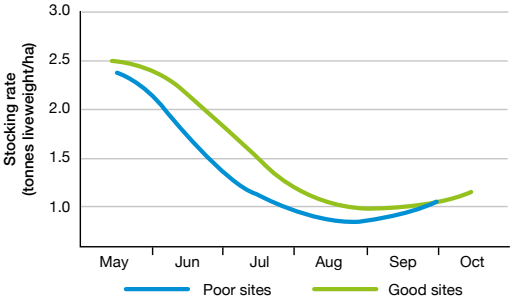


Figure 3. Tonnes of liveweight that different sites are able to sustain during the grazing season

Calculating livestock units/ha

A livestock unit (LU) is usually defined in terms of metabolisable energy (ME) requirements. One LU is considered as the amount of feed energy needed for the maintenance of a mature black and white dairy cow.

Table 6. Summary of livestock units

Beef	Livestock units
Beef cow	0.75
Beef bull	0.65
Heifers in calf	0.80
Other cattle 0–12 months	0.34
Other cattle 12–24 months	0.65
Other cattle over 24 months	0.80
Barley beef	0.47
Sheep	**Livestock units**
Lowland ewes	0.11
Upland ewes	0.08
Hill ewes	0.06
Rams	0.08
Store lambs younger than one year	0.04
Breeding ewe lambs 6–12 months	0.06
Other sheep over one year	0.08

Source: Derived from Defra (2010) Definition of Terms used in Farm Business Management

Understanding dry matter

Dry matter is the weight of feed with the water removed. This means that if grass has a DM content of 15 per cent, it contains 85 per cent water.

When calculating feed rations, the DM figure is always used because this allows the amount of feed in a field to be assessed and expressed as kg DM/ha. Grass DM varies with the weather (see Table 7).

Cutting a known area of grass and drying it is the 'gold standard' for assessing pasture cover and for calibrating plate meters.

Table 7. Grass DM varies with weather

Weather	DM%
Continuous rain	10–12
Mixed sunshine and rain Small amount of surface moisture	13–16
Mainly dry No surface water	17–19
More than five dry days and high temperatures	20–22
Drought	23–24

Calculating grass DM percentage

To calculate grass DM percentage, first take representative samples. The samples can be sent to a laboratory for analysis to calculate an estimate of DM or you can calculate the DM using an oven or microwave.

How to sample

First, make a sampling ring of 0.1m^2. Cut a 116cm length of wire and bend back 2cm on each end. Slip the two bent ends together to create a ring 36cm in diameter.

- Place the wire ring on the ground (A)
- Cut the sward to ground level, collect and weigh in grams (B)
- Remember to take three representative samples per hectare (C)
- Send to a laboratory for analysis in a sealed air tight bag or dry in a microwave or an oven at 60°C for 24 hours

If using a microwave, weigh the sample before and keep drying until the weight no longer changes. This represents the DM. Ensure that a full glass of water is placed inside with the sample while it is being dried. Grass DM percentage is calculated by dividing the final dry weight by the original wet weight, then multiplying by 100. For example, 25g divided by 145g equals 0.18, then multiply by 100 equals 18 per cent.

How to calculate pasture cover from a 0.1m^2 sample

In a 0.1m^2 cut sample, pasture cover equals dry weight (g) multiplied by 100. So, if the dry weight of grass is 25g, the pasture cover (kg DM/ha) = 25g x 100 = 2,500kg DM/ha.

Feed planning

Grassland farmers manage feed supply and demand all the time. When grass is surplus to livestock needs it can be conserved as silage or hay. When feed requirements outweigh supply a larger grazing area is needed, supplementary feed offered or stock numbers reduced.

There are three stages to feed planning:

1. Calculating livestock feed requirements.
2. Estimating grass supply, measuring pasture cover and adjusting for anticipated growth.
3. Preparing a feed budget and determining field or paddock set-up.

Livestock requirements are calculated from the feed needs of the stock. Grass supply information comes from measuring the grass. Having a clear understanding of grass supply and demand can help identify whether or not there are opportunities to reduce the amount of bought-in feed or better ways to utilise the grass.

Identifying any supply and demand gaps allows decisions to be made before shortages or surplus grazing occurs and allows better management of the grazing area.

English farmers taking part in grazing projects supported by AHDB have shown that when grazed grass supply and feed requirements are matched on an annual basis, farm profit increases.

Examples of feed planning and budgets are given on pages 24–27. A forage cost calculator is also available at **beefandlamb.ahdb.org.uk**

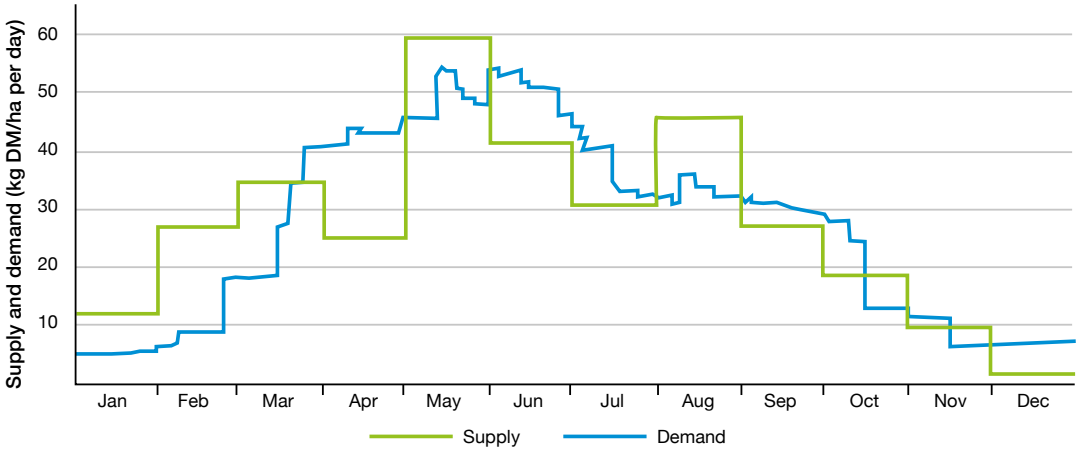


Figure 4. An example grass supply and demand curve

Livestock feed allocation

Animals' dry matter intake (DMI) is generally around 2–3 per cent of their bodyweight, depending on the stage of production and grazing quality.

Successful grazing relies on keeping good-quality grass in front of the animals.

Indicators of good feed quality include little or no seed heads, high clover content (>30 per cent), a high proportion of leaf, low stem content and low levels of dead matter at the base of the sward (see page 25).

If pasture quality is low, or grazing is tight, animals may eat their intake but may not gain weight as expected because they have insufficient energy.

It is important to accurately weigh each type of stock. Weigh groups and calculate the average. If weighing all animals in a group is not possible, weigh at least 10 per cent to obtain a rough average. For breeding stock, weighing at least twice a year (usually at tupping/bulling and at weaning) gives a base weight.

Table 8. Feed allocation guidelines

Class of stock	Allocation (% of bodyweight)
Dry ewes or cows Mid pregnancy ewes or cows Mature rams or bulls	1.5
Late lactation cows Late pregnancy ewes or cows	2
Finishing cattle Early to mid lactation cows Mid or late lactation ewes Replacements, incl. ram lambs	2.5
Growing cattle Early lactation ewes* Flushing ewes or cows	3
Growing lambs	4

Notes: * = Allocation may exceed 3 per cent in early lactation

Targets for kg DM/ha

Beef

- Maximum cover 2,500kg DM/ha
- Ideal post-grazing target (residual) 1,500kg DM/ha
- For continuous (variable) aim for 2,000 to 2,500kg DM/ha
- For animals with high feed requirements, eg growing stock or cows in early lactation, aim for a residual of 1,800kg DM/ha

Sheep

- Maximum cover 2,200kg DM/ha
- Ideal post-grazing target (residual) 1,500kg DM/ha
- For continuous (variable) aim for 1,800 to 2,000kg DM/ha
- For animals with low feed requirements, eg dry ewes or fit ewes during early/mid-pregnancy, aim for a residual of 1,200kg DM/ha

Calculating available feed

It is important to remember that not all grass grown is available. Around 900kg DM/ha cannot be physically eaten by livestock and some must be left to support rapid plant regrowth. The amount left after stock is removed is known as the residual. Some is inevitably wasted.

Figure 5. Available feed portion of grass

Matching grass supply to requirements

To work out whether grass growth is adequate to support a group of livestock in the immediate future, calculate livestock daily requirements and compare with measured grass growth or typical growth rates (see Table 9).

Table 9. Example of how to calculate daily demand for a flock of sheep in April

Stock type	Weight (kg)	Allocation (%)	Allocation (kg DM)	Number of animals	Total allocation (kg DM/day)
	A	B	A × (B/100) = C	D	C × D
February lambing ewes	75	2.5	1.9	250	475
April lambing ewes	60	3.0	1.8	550	990
Replacements	45	2.5	1.1	160	176
Rams	95	1.5	1.4	16	22
				Total	1,663

The total demand for this group of sheep is 1,663kg DM per day. If the total grazing area available for the flock is 50ha, the daily requirements per hectare would be calculated by:

$$\frac{\text{Group daily requirement per day}}{\text{Grazing area (ha)}} \quad \frac{1{,}663}{50} \quad = 33\text{kg DM/ha per day}$$

If grass growth is less than 33kg DM/ha per day, the daily requirements would not be met by growth alone and pasture covers would drop.

Preparing a feed budget

A feed budget is essential to see if there is likely to be enough grass to meet stock requirements over a long period. It involves calculating how much grass the group of stock needs and how much grass will grow in the area allocated to them for grazing. Remember to account for animal growth, the need to increase body condition score or the changing weight of pregnant stock, which lead to increased bodyweight and greater feed requirements.

Information needed:

- Livestock feed requirements – livestock weight (kg), allocation (per cent of bodyweight – see Table 8) and stock numbers
- Grazing area for group (hectares)
- Average pasture cover on grazing area at start (kg DM/ha) and estimated daily growth rate (kg DM/ha per day)
- Anticipated grazing days
- Target cover at end of grazing period

Two examples of feed budgets are given on pages 24–27.

Calculating grazing rotation

Efficient grazing involves providing enough grass to meet the livestock feed requirements without grazing below the post-graze target or offering too much, which will lead to reduced grass quality and utilisation. The key is to plan ahead and estimate how long the stock will need to be in each field before they are moved to the next, taking into account grass growth rates. An example for growing cattle is shown in Tables 10 and 11.

Example grazing rotation plan for growing cattle

In this example, an area of 7ha will be grazed with 60 growing cattle, weighing an average of 250kg each. The grazing area is split into 1ha paddocks. Pre-grazing grass cover is 2,800kg DM/ha and estimated grass growth is 30kg DM/ha per day. The target post-graze cover is 1,500kg DM/ha.

Grass availability

Grazing area for group (hectares) = 7ha (1ha paddocks)
Average cover on grazing area at start (kg DM/ha) = 2,800kg DM/ha
Estimated daily growth rate (kg DM/ha per day) = 30kg DM/ha per day
Target post-graze cover (kg DM/ha) = 1,500kg DM/ha

Livestock feed requirements

Livestock weight (kg) = 250kg
Allocation (per cent of bodyweight) from Table 8 = 3%
Stock numbers = 60

The first step is to calculate the total daily DM requirement of the group, then subtract daily grass growth (see Table 10). From this, the rotation length can be calculated (see Table 11). This approach can be adapted to plan grazing rotations for all classes of livestock.

Table 10. Calculating group requirements

Stock	Weight (kg)	Allocation (%)	Allocation (kg DM per head)	Number of stock	Group requirement (kg DM per day)	Group requirement less growth (kg DM per day)
	A	B	A × (B/100) = C	D	C x D = E	E – daily growth = F
Growing cattle	250	3	7.5	60	450	420

Table 11. Calculating rotation length

Available grazing (kg DM/ha) (Average pre-graze cover – post-graze target)	Available grazing per paddock (kg DM)	Time in each paddock (days)	Rotation length (days)
G	G × paddock size = H	G ÷ F = J	No. of paddocks x J = K
1,300	1,300	3	21

Plotting pasture covers

Ideally, all fields should be at different stages of grass growth so stock could move into a field at the target sward height/cover and benefit from high-quality grazing to optimise stock performance and sward utilisation. However, this is difficult to achieve. Regularly measuring pasture covers and plotting them on a bar graph can improve grazing management. Efficient grass farmers plan the weekly management of their stock by producing a feed wedge. Software systems are available.

Using a feed wedge

Plot the covers on a bar graph, with the field with the most grass first and the least grass last. The target pre-grazing cover is marked on the left and post-grazing on the right. A line drawn between these two points is the demand line. In an ideal situation the top of each bar would follow the target line.

If grass growth is lower than expected, increasing the speed of the rotation will cause the stock to run out of grass. Supplementing with conserved forages or concentrates will help to bridge the shortfall, but adds extra costs. Selling animals finished or as stores will reduce overall grass demand. If grass growth is higher than expected, it may be possible to jump a field, shut it up for silage or bring in more animals to eat the excess.

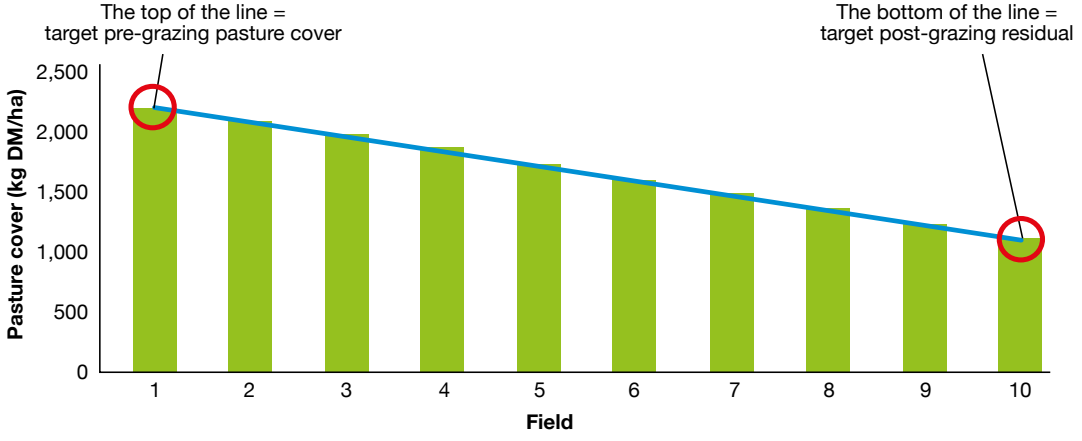


Figure 6. Feed wedge showing the ideal amount of pasture cover in each field in a grazing rotation

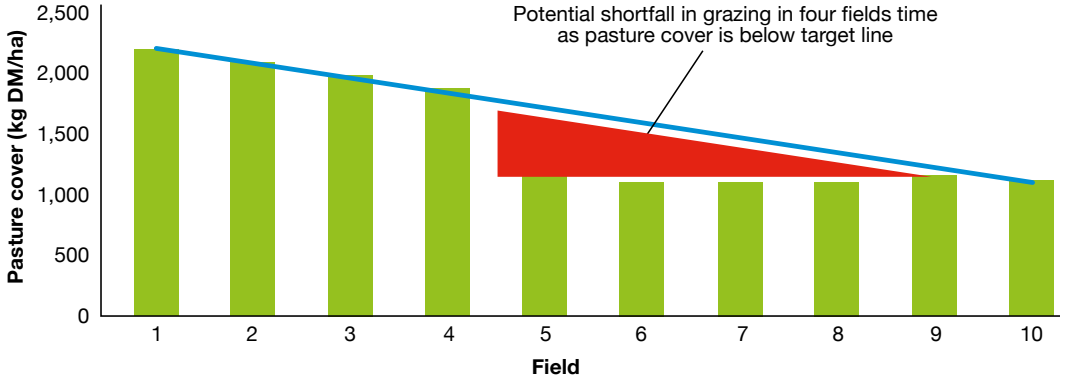


Figure 7. Feed wedge showing the potential shortfall in pasture cover

How to develop a grazing plan

The challenge with a grazing plan is that it will change – grass may not grow as predicted or the weather might become a factor. The key is flexibility and reacting to the circumstances, with the overall aims of improving grass utilisation and performance.

The best place to start is to break the farm down into separate, more manageable rotations, which makes it possible to use different approaches. A rotation planner can be used to understand the impact of the animal group size and area. It can also be used to adjust rotations as the season progresses.

Table 12. Example rotation planner for sheep, with guidance notes

Variable for rotation planner	Data	Notes
Pre-graze pasture cover (kg DM/ha)	1,800	Enter pre-grazing cover for the area
Target residual (kg DM/ha)	1,500	Enter target residual for the area
Grass growth rate (kg DM/ha per day)	45	Enter estimated grass growth for the period of interest
Number of paddocks in rotation	5	Enter number of paddock in the rotation
Average size of paddock (ha)	3	Enter the average size in ha of the paddocks
Length of time in paddock (days)	2	Enter the number of days that the animals are in each paddock
Duration of rotation (days)	10	Calculated from the number of paddocks and the days in each paddock
Utilisation (%)	70	Enter utilisation (poor weather <50%, optimum conditions ~75%)
Available feed while in paddock (kg DM)	819	Calculated from difference between pre-graze and residual, plus growth and taking into consideration utilisation, for all the paddock
Number of stock	250	Enter the number of animals
Average weight (kg)	65	Enter the average weight of animals
Allocation (% of bodyweight)	2.5	Enter allocation – 1.5% = maintenance, 2.5% = moderate energy requirement, 4% = high energy requirement
Daily dry matter allocation (kg DM per head)	1.6	Calculated – based on dry matter allocation and average weight
Potential daily allocation (kg DM)	1.6	Calculated from available feed and number of stock
Predicted pre-graze pasture cover (kg DM/ha)	1,862	Calculated from number of days until back in paddock and grass growth, adjusted for any changes to target residual

How to develop a grazing plan

Step 1

Get a farm map and divide the farm into rotations, based on similar field sizes, location or accessibility. Previous grazing history is crucial at this stage, as it is likely that rotations will be based on what has happened before.

Step 2

Work through an example based on one of these rotations and a group of stock. For example, a group of 35 cows and calves are to be grazed on a rotation of 30ha of five paddocks from March until October. Silage is planned for some of the fields.

The group's daily allocation is around 800kg DM. This is based on the cows weighing around 680kg, with an allocation of 2.5 per cent of bodyweight.

The rotation will change as the area available changes and grass growth increases or decreases. In this example, the first rotation will consist of five paddocks while the grass growth is lower. The example rotation on Page 23 includes four paddocks, as one will be shut up for silage but grass growth will be higher. See Table 13.

In the first example rotation, potential daily allocation is lower than ideal at 16.2kg DM, but it is likely to be close enough to the 17kg DM per head needed for the rotation to work.

For the second rotation, grass growth has increased so one paddock has been shut up. If the predicted pre-graze pasture cover is increasing above the target, it is likely that two paddocks could be removed. See third rotation in Table 13.

Pasture cover must be monitored to make sure the rotation is working as predicted, as grass growth may vary. Stock performance must be monitored to ensure allocations are appropriate.

If pasture covers are not being met, do not speed up the rotation. It might be worth giving supplementary feed to ensure the grass is recovering in front of and behind the animals.

A video of how to use the rotation planner is available on the **AHDB Beef & Lamb YouTube channel.**

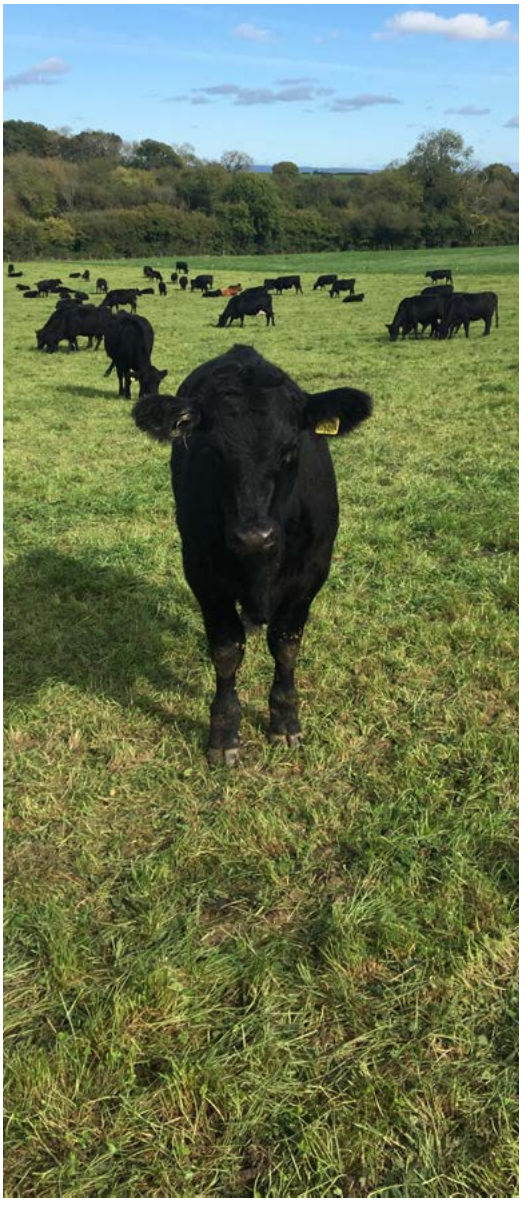


Table 13. Example rotations for cows and calves

	First	Second	Third
Pre-graze pasture cover (kg DM/ha)	2,200	2,146	2,203
Target residual (kg DM/ha)	1,650	1,650	1,650
Grass growth rate (kg DM/ha per day)	25	45	60
Number of paddocks in rotation	5	4	3
Average size of paddock (ha)	6	6	6
Length of time in paddock (days)	5	4	5
Duration of rotation (days)	25	16	15
Utilisation (%)	70	70	70
Available feed while in paddock (kg DM)	2,835	2,839	3,583
Number of stock	35	35	35
Average weight (kg)	680	680	680
Allocation (% of bodyweight)	2.5	2.5	2.5
Daily dry matter allocation (kg DM per head)	17.0	17.0	17.0
Potential daily allocation (kg DM)	16.2	20.3	20.5
Predicted pre-graze pasture cover (kg DM/ha)	2,146	2,203	2,267

Need to adjust number or allocation if this figure does not match daily dry matter allocation.

Need to adjust the number of stock being grazed or length of rotation if this does not match target pre-graze pasture cover.

Partial feed budget

A feed budget can be drawn up to check whether forecasted grass availability will sustain a group of livestock over the planned grazing period.

Table 14 shows an example for in-lamb ewes grazed from three weeks post-tupping to three weeks pre-lambing, on an AGW system.

For 950 ewes in a good winter grass growing area, plate meter measurements estimated average pasture cover at 1,982kg DM/ha, which was rounded up to 2,000kg DM/ha. The feed budget was calculated using an assumed winter growth rate of 10kg DM/ha per day of high-quality grass (see Table 14).

For ewes being managed in an AGW system, the correct amount of grass DM to allocate daily to ewes is based on 1.5 per cent of bodyweight up to scanning. After scanning, this must be increased to around 2 per cent of bodyweight.

Table 14. Partial feed budget for 950 mature ewes assuming 10kg DM/ha per day grass growth, high-quality feed and 200 per cent scanning

Initial pasture cover 2,000kg DM/ha				
	Dec	Jan	Feb	Mar
Grazing area (ha)	110	110	110	110
Grazing days	31	31	28	20
Net growth rate (kg DM/ha per day)	10	10	10	10
Animal allocation				
Number of ewes	950	950	950	950
Weight (kg)	65	67	69	70
Allocation (% of bodyweight)	1.5	1.5	2.7	2.7
Daily allocation (kg DM)	1.0	1.0	1.9	1.9
Total daily allocation (kg DM)	950	950	1,770	1,796
Total monthly animal allocation (kg DM)	29,450	29,450	49,556	35,920
Allocation per ha (kg DM/ha per day)	8.6	8.6	16.0	16.3
Difference between growth and allocation (kg DM/ha per day)	1.4	1.4	-6.0	-6.3
Average pasture cover (kg DM/ha)	2,043	2,086	1,919	1,793

Note: The feed budget accounts for bodyweight increase as pregnancy progresses. Animal allocation per ha per day is calculated to determine the difference between allocation and growth per hectare, which will affect pasture cover.

Accounting for feed quality

Pastures with a high proportion of dead material or stems will be of lower feed quality than swards containing a high proportion of green leaf material.

For example, in all grass wintering the number of lambs a ewe is carrying also affects her feed demands. Both of these factors can be accounted for using Table 15.

Use these figures as a guide and increase allocation to 3 per cent of liveweight per day in wet and windy weather to allow for extra demands and feed wastage. If grass growth has been poor and ewes are losing too much condition, gradually feed up to 0.45kg of concentrates per day and house if necessary. See the BRP manual **Improving ewe nutrition for Better Returns** or the BRP+ document **All Grass Wintering of Sheep** for more information.

Table 15. Daily feed allocation from scanning to lambing adjusted for pasture quality and scanning results

Feed quality	Singles	Twins	Triplets
	kg DM per ewe per day for a 65kg ewe (% of bodyweight)		
Low	1.2 (1.8)	1.5 (2.2)	1.6 (2.5)
High	1.1 (1.6)	1.3 (2.0)	1.5 (2.2)

(Calculated using SRUC FeedByte rationing software)

Think about feed quality

Animal performance is directly linked to the quality of the pasture on which they are grazing.

Feed quality can be assessed simply by looking at it: the more green leaf there is, the higher the quality will be. More stem means lower quality because of the presence of increasing structural fibre. As the amount of dead matter increases, the quality drops further.

High-quality feed should be prioritised for high-performing stock, such as ewes and lambs, cows and calves or growing cattle. Dry stock, such as weaned ewes or cows, can be used to clean up poor-quality swards, as they have lower energy requirements.

Metabolisable energy (MJ kg DM)		
>11.5	10.5	<8
		
Optimal quality	Moderate quality	Poor quality

Full feed budget

Utilisation – will depend on the time of year and the grazing strategy

Initial pasture cover – the average pasture cover at the start of the feed budget (in this example it would be 1 January)

Animal allocation – calculated from the boxes below (the total monthly animal allocation divided by the grazing area and then by the number of days in the month)

Difference – the difference between net growth rate (supply) and animal allocation (demand) without any supplements added

Supplements per month – the total being fed (in tonnes of DM per month) of hay, silage or concentrates

Supplements per day – the data on the supplements being fed (as kg DM/ha per day) divided by the number of days in that month

Difference + supplements – the difference between grass growth and supplements (supply) and animal allocation (demand)

Pasture cover – the average pasture cover at the end of the month, working from the initial, or the previous month's pasture cover and the difference between daily feed supply and demand, eg if there is an over-supply the pasture cover will increase, if there is an under-supply the pasture cover will decrease

Initial pasture cover	1800		
	Jan	**Feb**	**Mar**
Grazing area (ha)	25	25	25
Grazing days	30	28	31
Growth rate (kg DM per ha per day)	0	10	20
Utilisation of grass (%)	65	65	65
Animal allocation (kg DM per ha per day)	10.4	10.7	13.8
Difference (kg DM per ha per day)	-10.4	-0.7	6.2
Supplements (in tonnes of DM per month)			
Hay			
Silage			
Concentrates			
Utilisation of supplements (%)	65	65	65
Supplements (in kg DM per ha per day)			
Hay	0.0	0.0	0.0
Silage	0.0	0.0	0.0
Concentrates	0.0	0.0	0.0
TOTAL	**0.0**	**0.0**	**0.0**
Difference (kg DM per ha per day) + supplements	-10.4	-0.7	6.2
Average pasture cover (kg DM per ha)	1488	1468	1660
ANIMAL ALLOCATION			
Ewes			
Number	200	200	200
Weight (kg)	65.0	67.0	69.0
Allocation (% of body weight)	2.0	2.0	2.5
Daily allocation (kg DM)	1.3	1.3	1.7
Total daily requirement (kg DM)	260	268	345
Lambs			
Number			
Weight (kg)			
Allocation (% of body weight)			
Daily allocation (kg DM)	0.0	0.0	0.0
Total daily requirement (kg DM)	0	0	0
Growing cattle			
Number			
Weight (kg)			
Allocation (% of body weight)			
Daily allocation (kg DM)	0.0	0.0	0.0
Total daily requirement (kg DM)	0	0	0
Total monthly animal allocation (kg DM)	7,800	7,504	10,695
Demand (kg DM per ha per day)	10.4	10.7	13.8

Feed budgets appear complicated but are a good way of gaining an idea of supply and demand. They can be used to plan the next season's grazing and to assess how the predicted supply and demand match up. They can also be used to investigate the effects of different stocking policies or grazing areas.

Grazing area – the amount of land that the stock has access to, reduce when fields are shut up for silage, hay or deferred grazing

Growth rate – the average growth rate for that month (see Table 1)

Number – the number of stock in the group adjusted for sales, purchases and deaths

Weights – the average weight of the group adjusted for pregnancy and body condition loss and gain over the year

Allocation – the % of bodyweight that the animals are consuming as dry matter (see Table 8)

Daily allocation – is the individual demand based on weight and allocation

Total daily requirement – is the daily allocation multiplied by the number of stock

Date								
Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	30	30	40	40	40	25	25	25
30	31	30	31	31	30	31	30	31
30	45	30	30	25	20	15	10	0
65	65	65	65	65	65	65	65	65
25.9	35.0	33.2	34.3	32.1	14.8	19.2	16.2	13.0
4.1	10.0	-3.2	-4.3	-7.1	5.2	-4.2	-6.2	-13.0
				5.0	5.0	5.0	5.0	
65	65	65	65	65	65	65	65	65
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	2.6	2.7	4.2	4.3	0.0
0.0	**0.0**	**0.0**	**0.0**	**2.6**	**2.7**	**4.2**	**4.3**	**0.0**
4.1	10.0	-3.2	-4.3	-4.4	7.9	0.0	-1.9	-13.0
1783	2092	1995	1861	1723	1961	1960	1904	1501
200	200	200	200	200	200	200	200	200
67.0	65.0	62.0	62.0	63.0	64.0	64.0	65.0	65.0
4.0	4.0	3.5	2.0	1.5	1.5	2.5	2.5	2.5
2.7	2.6	2.2	1.2	0.9	1.0	1.6	1.6	1.6
536	520	434	248	189	192	320	325	325
			350	300	250	100	50	
			38.0	39.0	40.0	40.0	40.0	
			4.0	4.0	4.0	4.0	4.0	
0.0	0.0	0.0	1.5	1.6	1.6	1.6	1.6	0.0
0	0	0	532	468	400	160	80	0
50	50	50	50	50				
400.0	425.0	450.0	475.0	500.0				
2.5	2.5	2.5	2.5	2.5				
10.0	10.6	11.3	11.9	12.5	0.0	0.0	0.0	0.0
500	531	563	594	625	0	0	0	0
31,080	32,589	29,895	42,586	39,742	17,760	14,880	12,150	10,075
25.9	35.0	33.2	34.3	32.1	14.8	19.2	16.2	13.0

Feed budgets can be completed on a piece of paper, by using a spreadsheet or a computer program. AHDB Beef & Lamb has resources to help farmers calculate their feed budgets. Email **brp@ahdb.org.uk** for more information.

There is a video explaining how to use a feed budget on the **AHDB Beef & Lamb YouTube channel**.

Troubleshooting

Too little grass

Cull unproductive animals

- Reduces demand
- Provides an opportunity to cull ewes or cows with problems

Sell stock

- Reduces demand
- Sell stores or finished animals at slightly lower slaughter weights
- Sell breeding stock
- Evaluate the cost:benefit of potentially reducing output against reducing the need to buy in feed

Supplementary feed

- Increases supply
- Conserved forages, home-grown or bought in, can be used
- Generally, conserved forage is twice the cost of grazed grass and four times that of cereals

Accept reduced growth rates and loss of condition

- Reduces demand
- Intakes are likely to be reduced, which means growth rates will be lower than anticipated and condition will be lost
- Will affect when stock is marketed, unless lower weights are accepted

Grow forage crops

- Increases supply
- If possible, drill forage crops, as they provide high-quality, cheap feed

Strategic use of nitrogen fertiliser

- Increases supply
- Applying nitrogen can increase grass growth but it needs to be timed appropriately to ensure that not too much grass is produced in a month's time

Calving or lambing at a different time

- Changes demand
- Does the peak of demand for late pregnancy and lactation coincide with peak grass growth?

Too much grass

Buy stock

- Increases demand
- Introducing disease is a risk, so ensure that strict biosecurity measures are taken

Shut up fields for silage or hay

- Decreases supply by increasing stocking density on grazing land
- An option if done at an appropriate time of year
- Can be a section of a field
- Making conserved feed costs money, but it can help grazed grass quality

Shut up fields for deferred grazing

- Decreases supply
- Fields should be shut up when around 6–8cm (1,750–2,000kg DM per ha) to ensure quality is maintained
- Can be a section of a field
- Needs careful grazing management, eg block grazing or AGW, to ensure utilisation is good

Reduce supplementary feeding

- Decreases supply
- The aim is to increase intakes from grass, which reduces the costs of supplementary feeding

Increase body condition score of ewes and cows

- Increases demand by increasing intake
- Convert extra grass to condition that can be lost gradually with no ill effects later in the season
- Needs careful grazing management to ensure utilisation is good

Calving or lambing at a different time

- Changes demand
- Does the peak of demand for late pregnancy and lactation coincide with the peak of grass growth?

Changes in stocking rate when sward height is above or below target (per cent of current stocking)

Current height	Change in height since measurement in previous week		
	Decrease	No change	Increase
High	0	+10	+20
On target	-10	0	+10
Low	-20	-10	0

Source: Hodgson et al.

A lot of dead grass in the bottom of the sward

Enter greater grazing pressure

- Sward height targets not maintained through the season, so leaves have been produced and died before being grazed
- The sward may need harrowing if the dead matter is affecting grass growth. Try to graze tight during autumn or winter to re-set it for the spring

Change the composition of the sward

- Weed grasses, such as creeping bent, can cause dead stalks and leaves to accumulate
- Look at nutrient and grazing management. If sown species are not fed or grazed properly then weed grasses will come back

Uneven swards with high and low areas

Ensure greater grazing pressure

- Sward height targets not maintained through the season, so animals have been selective
- Starts with rejection around dung pats
- Topping may be needed. Aim to re-set every pasture once a year with either a topper or mower set to 4–5cm

Measure sward heights or pasture cover

- Try to assess the variation in the field. Use measurements to evaluate the effects of shutting up areas or changing stocking rates on uneven swards

A lot of weeds in the sward

Reduce weed numbers

- Poaching has encouraged germination of weeds
- Consider why poaching is happening
- Contemplate spraying with herbicide
- But consider the amount of nitrogen being fixed by clover before spraying

Ensure grasses are dominant

- Soil test and ensure pH, phosphate and potash levels are on target
- Ensure good nutrient management

Animals not performing on grass

Ensure good sward quality

- Sward height targets should be maintained – grass that is too long is lower in quality
- Sward height targets should be maintained by altering stock density

Check parasite burden

- Grazing livestock are at risk of internal parasites. Plan a worm control strategy with the vet

Case studies

Mark Jelley, Perkins Lodge, Northampton

Mark Jelley calves approximately 80 Friesian-cross-Hereford cows and around 20 replacement heifers, during 10 weeks in the spring. He uses three Blonde bulls and finishes all offspring. The heifers are sold to a local butcher, while the steers are finished intensively.

In 2013, he began to trial a rotational grazing system for his cows and calves. He developed three rotations on his 38ha grazing platform, which act as bulling groups. As the cows calve, they are turned out into a paddock near the sheds until there is a group of 10, when they are then moved into one of the rotations. Groups are moved around the rotation based on grass availability and field size throughout the grazing season. During the winter, Mark feeds his cattle a straw-based diet with supplements, which means he has no requirement for silage.

In 2012, when he was set stocking, Mark produced 630kg/ha of weaned calf. In 2015, however, he produced 771kg/ha – an extra 5.4 tonnes of weaned calf and a big improvement. This means that he reared more calves off the same area and each calf was 20kg heavier at weaning, on average. These gains cannot be fully attributed to the change in grazing management because he also started using more nitrogen fertiliser and carried out more buffer feeding, but the introduction of rotational grazing has certainly helped.

In the summer of 2015, Mark was caught out by a drop in grass growth, which is why he had to buffer feed. He now plans to start recording grass covers to give him more information about when growth begins to drop. The challenge in the summer is that his arable enterprise takes priority over the suckler herd. However, measuring grass will inform his management decisions and should enable him to make changes sooner, without demanding too much time.

Mark is taking part in the AHDB Strategic Farms initiative and is focusing on grassland management which he believes is a valuable to tool in achieving optimal utilisation and better herd performance. He is planning to further subdivide some of his fields to make it easier to clean out the paddocks.

Matthew Blyth, Didling Farms, West Sussex

Matt has been the manager at Didling Farms since 2009. The 316ha farm is located in the heart of the South Downs National Park and the sheep system is made up of an 800-ewe flock that lambs indoors in mid-March. The sheep are grazed with a small group of cattle on 194ha, with around 30 per cent of the land being permanent pasture and a further 30 per cent being low or no input. The remaining third is made up of 73ha of white clover leys and 8ha of red clover leys.

With land types ranging from high-quality cropping areas to less productive ground, the pasture quality is variable and Didling Farms has relied heavily on five-year leys. The farm has introduced high-sugar grasses with high clover content into new leys, in combination with chicory and plantain. With good management and improved varieties, they are also getting up to five years out of the red clover pastures.

After turnout, ewes are set stocked for several weeks in groups of 40–60 to prevent mis-mothering. Four to seven weeks after lambing, the ewes are then grouped into large grazing mobs of 500–700. Measuring grass production using a sward stick has helped to inform management decisions on a short and longer term basis.

For several years, using FARMAX software has helped with feed budgeting to monitor feed supply and demand (see Figure 8).

The farm experiences dry summers, so the staff work out whether they can afford to shut up paddocks for silage for housed in-lamb ewes without affecting stock performance. Calculations are also done in preparation for weaning to ensure enough DM is available for ewes to hit body condition targets for tupping. If it looks like there is too much or too little DM, FARMAX is used to build scenarios to help find the best solution, both in terms of animal and financial performance.

The improvement in daily liveweight gain between 2009 and 2015 has been significant, although this cannot be wholly attributed to the improved grazing management because various other management decisions have also been improved.

Matt was involved in the Sheep KPI project and now the Challenge Sheep project, which will be focusing on the lifetime performance of ewes.

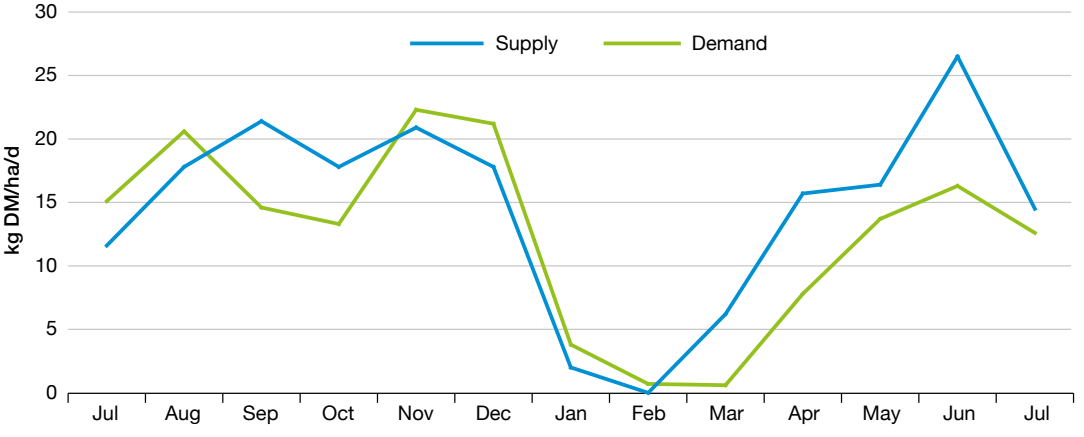


Figure 8. A FARMAX image of supply and demand for Didling Farms

Beef and sheep BRP Manuals

Manual 1	Improving pasture for Better Returns
Manual 2	Assessing the business for Better Returns
Manual 3	Improving soils for Better Returns
Manual 4	Managing clover for Better Returns
Manual 5	Making grass silage for Better Returns
Manual 6	Using brassicas for Better Returns
Manual 7	Managing nutrients for Better Returns
Manual 8	Planning grazing strategies for Better Returns
Manual 9	Minimising carcase losses for Better Returns
Manual 10	Growing and feeding maize silage for Better Returns
Manual 11	Using medicines correctly for Better Returns

See the AHDB Beef & Lamb website **beefandlamb.ahdb.org.uk** for the full list of Better Returns Programme publications for beef and sheep producers.

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