

THE WHAT, WHY AND HOW OF PROFITABLE FEED MANAGEMENT

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Introduction

Successful spring feed management is achieving the right balance between feeding the herd well each day and maximising high quality pasture at subsequent rotations. Pasture eaten per hectare and farm working expenses, of which feed costs contribute about 23% (Dairy NZ Economic Survey, 2013/14), have a large impact on the financial performance of a farm business. The challenge during this period is to match feed supply and herd demand and to set up the farm for the next rotations; however, this period is very volatile, with large ranges in climatic conditions and subsequent pasture growth. Following the end of the first rotation, challenges continue to arise with pasture surpluses and deficits occurring.

The tactical plans that are laid, and the daily operational decisions that are made, are pivotal to the success of the business during this time and for the remainder of the season. Although there are a number of resources and touch points available to help with feed management decisions, sometimes it is difficult to know which one is the most appropriate to use and what these may offer. The following article will define the steps followed when making successful feed management decisions and outline various resources and tools that can be used to support these decisions during the challenging spring and early summer period.

Figure 1 depicts the feed demand and pasture growth profile for a farm system stocked at 3.5 cows/ha at the Lincoln University Research Dairy Farm in the 2014/15 season. Two of the more challenging periods are highlighted; the first rotation of the season and a period of volatile pasture growth potentially resulting in surpluses and deficits if not well managed, with large implications for pasture growth and quality.

During the **1st rotation**, there is a large gap between pasture growth and herd demand. During this period it is important to stay on a long rotation length to ensure the inclusion of pasture in the diet

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of the milking cow everyday (good quality protein source) and to ensure a large quantity of high quality pasture is available for the second rotation. The spring rotation planner (SRP) is a tool widely used to achieve this and is based on grazing a set proportion of the farm each day during this period. As you near the end of the 1st round, and approach balance date (supply = demand) it is of increased importance to monitor pasture supply (APC) and growth rates. This will enable you to recognise when the rotation can be sped up, allowing for more pasture to be included in the diet and easier management of the impending pasture surplus.

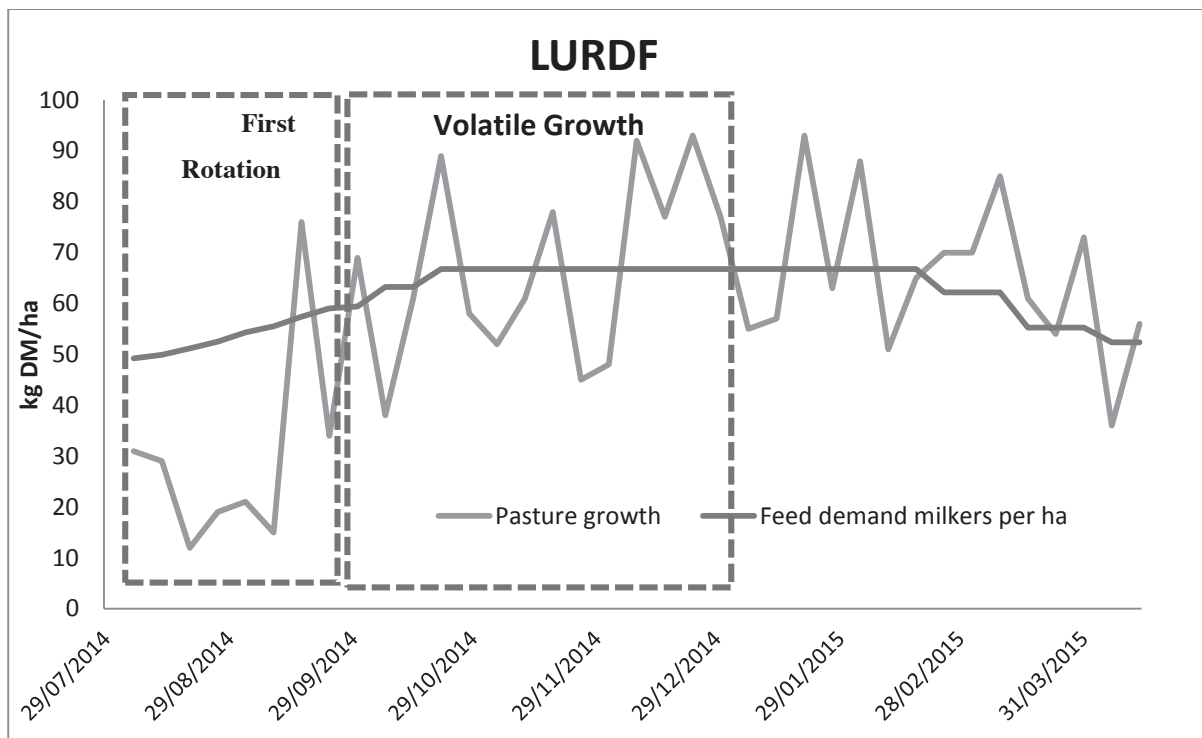


Figure 1. Feed demand and pasture growth profile for Lincoln University Research Dairy Farm.

From balance date onwards, the challenge is to manage a volatile pasture supply while optimising animal performance. This requires pre-empting feed **deficits** and managing these with N fertiliser and/or gibberellic acid (GA) application and/or inclusion of supplements. In addition, it requires identifying and capturing **true surpluses** as they arise. Having an effective feed management process in place will simplify these challenges. In addition, to ease of management, recent modelling work indicates that managing paddock selection and capturing surpluses effectively can potentially add up to \$525/ha to farm operating profit.

So how can you develop a simple yet effective feed management plan and increase operating profit on your farm?

Feed management process

Figure 2 depicts a feed management process. This can be divided into three main phases: Establish the Plan, Refine the Plan and Manage the feeding event.

1. Establish the Plan
 - a. recruitment of paddocks into a grazing plan (selected and ordered)
 - b. short-term feed budget based on indicators of pasture supply
 - c. supplement requirements determined – likely amount and type
2. Refine the plan
 - a. shuffling of the paddock grazing sequence
 - b. refinement of supplement amount
3. Manage the feeding event
 - grazing event - before, during and after the event
 - amount of supplements fed

Based on the phases in this process we can determine which tools and information are required in a timely manner. We can also determine what skills and technical knowledge are required by different members of the farm team as they move through the process.

1. Establish the plan

As the old saying goes “failing to plan is planning to fail”. The planning phase is where decisions are made about paddock recruitment and supplement type and amount. These decisions are based on key indicators such as rotation length and pre-grazing yield and tend to be made on a weekly basis during the main grazing season and over a longer time period at the start and end of the season.

2. Refine the plan

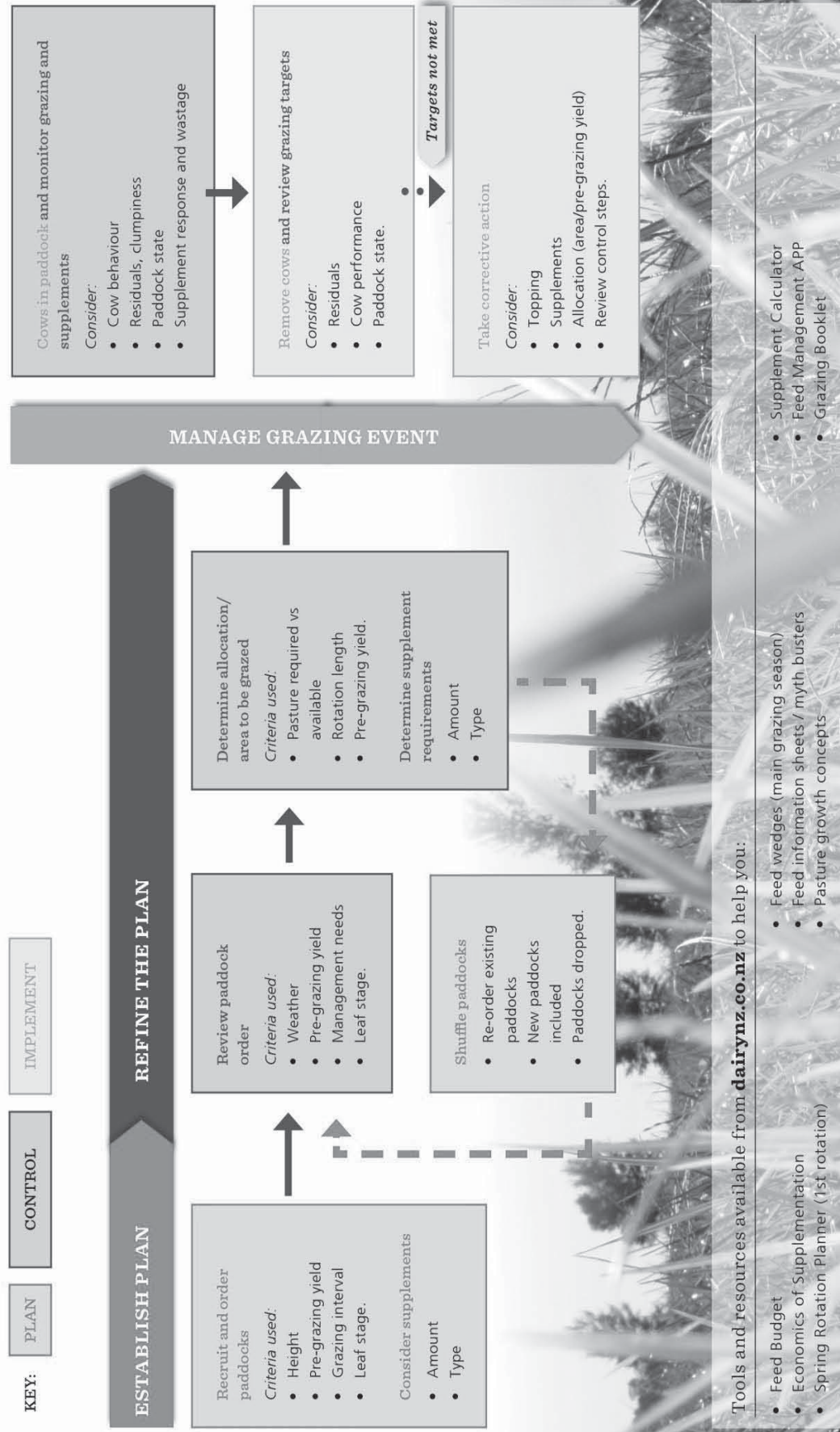
In periods of varying pasture growth and a desire to achieve high levels of animal performance a clear plan which is subsequently refined is paramount to ensure any uncertainties (e.g. weather, growth rates) can be addressed. For example, a farmer might develop a plan for the week ahead and monitor pre-grazing yield because of the uncertainty provided by rapidly changing grass growth rates in late spring. If the pre-grazing yield moves outside the target range, the farmer may then consider contingency plans to negate this such as adding supplements into the systems (if less than target) or

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making some baleage (if greater than target) or this may trigger a need to do a farm walk and create a new plan.

Those not implementing any initial planning phase or refining the plan may find themselves trying to identify paddocks on a daily or ad-hoc basis and feeding expensive supplements unnecessarily. Consequently, feeding levels will vary hugely. This will provide large fluctuations in the feed offered to the herd, and the quantity and quality of pasture at the next grazing event. Therefore, this planning phase is vital to ensure the best use of all feeds on the farm and to ensure a continual supply of high quality pasture throughout the season to enable high animal performance.

Figure 2. Feed Management Process



3. Manage the feeding event

This phase “manage the feeding event” relates to the decisions around pasture and supplement allocation, management of the herd while in the paddocks, using cow and pasture indicators to determine if the cows are adequately fed.

Ironically, this phase of the process is what many people see as the entire feed management process. However, if issues such as excessive pre-grazing yields occur, then at this point effective decision making is more complex and risky as it is now a reactive practice. Without prior consideration of the whole feed management process and the principles of pasture growth and supplement incorporation there will be an increased number of corrective actions (e.g. mowing, cows back into paddock) required at this stage. Unfortunately these are often undertaken poorly with large negative carry-over effects (change in rotation, poor pasture regrowth/quality).

This highlights the need to implement a proactive approach to feed management: establish a clear plan, and then refine this plan based on the outcomes of the previous grazing events and impacts of other factors (weather, growth rates, feed costs).

Underlying principles and available supporting resources

In order to implement a successful feed management process during spring/early summer and set up the farm for the remainder of the season, knowledge of the underlying principles and available supporting resources is required.

Managing the first rotation

The SRP is an example of a tool that helps achieve a successful 1st rotation and sets up the farm for the season ahead. The SRP allocates a set area per day (or per week) from when the mixed age cows calve to balance date, when pasture growth equals herd demand, starting on a slow rotation and speeding up to the fastest rotation the farm is on in the spring (excluding when silage paddocks are harvested). The SRP results in approximately 1.2 to 1.3 rotations of the farm in 8 weeks, depending on whether the SRP starts on a 100 or 80 day rotation, respectively. It is most effective when the target average pasture cover (APC) at calving is reached and actual pasture cover is monitored. The target APC at balance date and for the subsequent weeks is calculated as:

$$[(\text{Demand per cow} \times \text{stocking rate} \times \text{rotation length}) \div 2] + \text{Residual}$$

$$\text{Eg. } [18 \times 3 \times 22] \div 2 + 1500 = 2094\text{kg DM/ha}$$

Challenges:

- Low pasture cover at planned start of calving (PSC)
- High / low spring pasture growth rates
- Wet weather leading to poor pasture utilisation and pugging.

Allocating feed

Correct feed allocation is crucial to ensure good animal performance. This requires accurate assessment of pre-grazing yields, an estimation of the pasture requirements of the herd, and information on paddock area. DairyNZ's Feed Eaten Calculator (FEC) APP has been developed to assist in this area. It provides information on the energy demand of the herd based on the requirements for MS production, maintenance, activity and BCS/liveweight change, in combination with feedback on pasture allocation.

If paddocks are grazed on an ad-hoc basis, matching feed supply to herd requirements is challenging, tends to complicate decision making and often results in more corrective actions being required. Additionally, a more consistent daily offering of high quality pasture to the herd allows assessment of the impact of management changes, such as the use of supplements, to be made.

Challenges:

- Fluctuating pre-grazing yields
- Farm races, paddock size, paddock access
- Ability to assess pasture yield
- Demands on time - requires good procedures and communication
- Changing cow numbers and cow intake.

Use of supplements

A recent survey of 500 farmers established that post-grazing residuals and animal behaviour are the key indicators used for successful feeding. Interestingly, case study (McCarthy et al., 2014; Chapman et al., 2014) and discussion group data highlights that targets

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are achieved infrequently and that the skill level in assessing residuals is low. While the DairyNZ's supplement price calculator can be used to estimate the marginal return from feeding different supplements it relies on the user to input a reliable figure for the grazing residual before supplement is fed. This is used as an indicator of the energy demand of the herd and factors in the cost of the supplement and associated costs (e.g. supplement wastage, capital, fuel/energy, labour, repairs and maintenance). However, it does not take into account the composition of the diet, nor the non-associated costs which need to be considered if making strategic decisions on supplement use (Kay et al., 2014).

Challenges:

- Securing the right supplements at the right price
- Focussing on the right metrics
- Transitioning between feeds
- Achieving good response rates – achieving a \$\$ return
- Maintaining high pasture eaten/ha and future pasture quality.

Managing pre-grazing yield

The importance of managing pre-grazing yield is highlighted in Figure 3 which illustrates that in order to reach target grazing residuals while optimising dry matter intake (DMI) it is very important to manage pre-grazing yields. For example, to achieve 16 to 18kg DMI per cow while reaching 3.5 cm (1500kgDM/ha) grazing residual, pre-grazing yield must be managed at between 2800 and 3200kg DM/ha (red dotted lines). If pre-grazing yields are very high (i.e. 4000 kg DM/ha) then either DMI will suffer (blue dotted lines) or post-grazing residuals will not be met (black dotted lines) and this will impact negatively on subsequent pasture growth and quality. During periods where a lower DMI (e.g. 14kg DMI) is sufficient, pre-grazing yields up to 4000kg DM/ha can still be grazed to 3.5cm (blue dotted line).

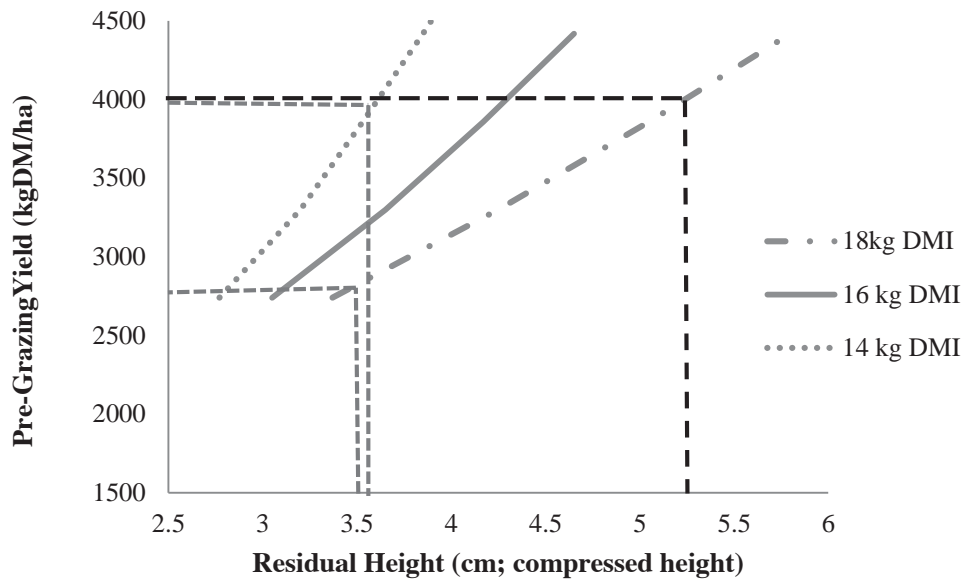


Figure 3: Simulated effect of pre-grazing yield and grazing residual height on dry matter intake (McCarthy et al., 2014).

Challenges:

- Volatile growth rates
- N fertiliser use
- A need for some to have a lot of grass on the farm (lack of control)
- Inability to assess pasture yield
- Need for quick actions.

Managing a surplus

Identifying and capturing true surpluses in a timely manner allows high quality baleage to be made which can be fed to milking cows during a deficit. Due to the volatile nature of pasture growth sometimes it makes sense to graze rather than conserve a number of high covers but identifying these situations will prove impossible if effective planning and refinement of feed management decisions is not occurring on the farm. Weekly farm walks and use of a feed

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wedge, or other approaches which offer the ability to assess the availability of pasture on the farm, are key to managing this.

Challenges:

- Recognising a true surplus
- Volatile growth rates
- Weather for ensiling
- Fear of having to feed out again too soon after.

Managing a deficit

As with pasture surpluses, pasture deficits are inevitable. Within our pasture-based systems, energy is predominantly the limiting factor during a feed deficit, particularly in the spring. In order to maximise profitability, it is important that the pasture resource is fully utilised before considering adding supplements. Where target grazing residuals have been achieved in autumn, and pre-grazing yields are managed to provide a good pasture wedge, cows can graze paddocks to 3.5 cm (1500kg DM) in the first rotation and in many cases slightly below that level (1400 kg DM/ha). For subsequent rotations it is important that cows are well fed on pasture, grazing to 3.5 to 4 cm, which also provided good grass growth and quality in the months ahead “If you look after your pastures, you look after your cow”. It is important that during a deficit the rotation length is not reduced as that will negatively impact on pasture growth, and knowledge of principles such as the 3-leaf stage are important.

Good planning will allow for larger pre-empted feed deficits to be addressed with the use of Nitrogen fertiliser and/or GA. Highest response rates to N fertiliser can be achieved during the spring period and hence this is a low cost option.

Conclusion

Feed management decisions made in spring will have a major impact on pasture, animal and financial performance. Planning is important and the execution of these plans crucial. There are a number of key tools available to use but each tool needs understanding so that when the inevitable challenges occur the right decisions are made and actions taken.

References

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- Chapman D, McCarthy S and Kay J. 2014. Hidden dollars in grazing management: Getting the most profit from your pastures. *In Proceedings of SIDE 2014*. pp 21-36

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McCarthy S, Hirst C, Donaghy D, Gray D and Wood B. 2014. Opportunities to improve grazing management. *In Proceedings of the New Zealand Grassland Association 76*: 75-80.

Tools and resources

Supplementation Price Calculator. <http://www.dairynz.co.nz/feed/feed-management-tools/supplement-price-calculator/>

Grazing booklet. Available in Spring 2015; Order at 0800 4 DairyNZ or online
<http://www.dairynz.co.nz>

Feed Eaten Calculator (APP). Available in Spring 2015 from DairyNZ

Spring rotation planner. <http://www.dairynz.co.nz/feed/feed-management-tools/spring-rotation-planner/>

Feed budgets. <http://www.dairynz.co.nz/feed/feed-management-tools/feed-budgets/>

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