

Spring Survival Guide

Top tips and tools for getting through spring





Welcome to the DairyNZ Spring Survival Guide

Spring is one of the most demanding times of year on a dairy farm, but there are practical things you can do to help it go smoothly, sustainably and with less stress - making things a little bit easier on your staff and yourself.

It is designed to be an easy-to-read reference covering the key activities underway on New Zealand dairy farms in spring, with the content in three sections:

- ① **Putting people first**
- ② **Pasture and supplement management**
- ③ **Taking care of your cows and calves**

Throughout the year we hold a wide range of discussion groups on specialist areas of interest as well as many other topical field days and events, so talk to your local Extension partner at dairynz.co.nz/co

For more details on any of the information provided in the guide, visit dairynz.co.nz or phone 0800 4 DAIRYNZ (0800 4 324 7969)

Our very best wishes for the season ahead

The DairyNZ Team

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Putting people first

If spring on your farm feels hectic try focussing on your employees to reduce stress and improve results. People are the difference between a crazy spring and a busy but enjoyable one.

Putting people first

Spring is busy on dairy farms and you can't change that. Sometimes it really does feel like it is about survival. But you can make a decision to run your farm in a way that is sustainable for everyone. If you put your team (that includes you and your staff) first then the results will follow – the calves reared, the cows milked, the pasture and feed managed – and with less stress and greater ease than when you focussed on tasks first.

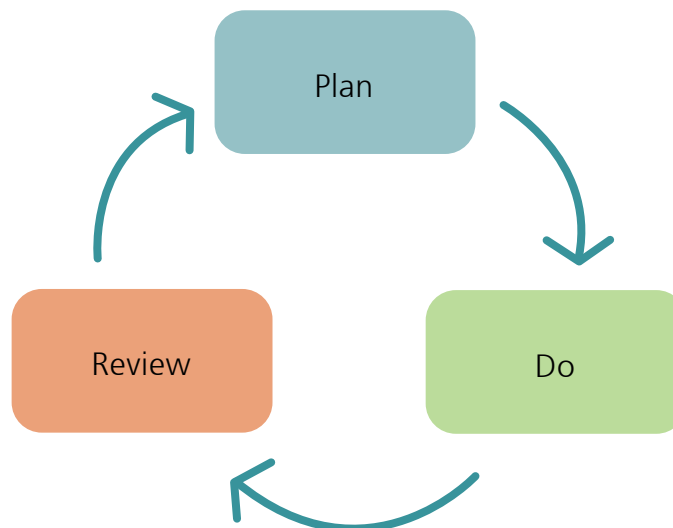
Good people, those with the right attitude and skills, make the difference between a crazy spring and a manageable one so focus on people and reap the benefits – both in spring and for the rest of the season.

How?

You need to get everyone performing at their peak and to achieve this your team needs:

1. To understand what you are trying to achieve and why
2. To understand what is expected of them
3. To feel respected and valued
4. To have time to recharge off farm so they can maintain efficiency on farm

Since spring is busy these things won't happen by chance. An effective and simple plan to use is:



Plan

Be prepared. There is no substitute.

The success of spring on your farm will largely be determined in the lead up to spring. Time you put into planning now will pay rewards when the first calf hits the ground.

The following list might seem like an extra pull on your time but actually it will be the thing that saves you the most time and reduces stress. Good planning is smart farming.

Top tips:

1. Get your team involved

- Sit down with your team and discuss what you want to achieve in spring
- Create a list of actions that will need to happen to achieve these targets
- Discuss why these actions are important
- Decide who is responsible for the different tasks / responsibilities
- Set dates where appropriate
- Capture information on white board or equivalent and put where everyone can see it.

2. Set a realistic roster for the spring period that will enable your team to perform at their best.

- All people on farm, including you, need at least one day off per week to recharge
- Employees should not be expected to work more than 48 hours per week but if required and they agree can work up to 60 hours although this should not be every week

3. Book the relief milker or employ a casual or fixed term employee so you have enough hands on deck. Although it is an additional cost those farmers that do it say it actually saves them money due to the efficiencies and productivity gained.

4. Ensure you have an orientation plan for new employees so they become effective quicker

- Use the orientation plan in the resources section found at dairynz.co.nz/people

5. Discuss and plan any training that your team needs to get through spring.

- Explain why the training is important to help learning
- Give staff time to practice what they have learnt so they remember
 - Go to dairynz.co.nz/milking for help on training your staff to milk efficiently
 - Go to dairynz.co.nz/mastitis and dairynz.co.nz/healthy-udder for help on training your staff in udder health and milk quality.

- 6. Ensure all employees have employment agreements in place – they can provide a reference point for both parties in stressful times.**
- 7. Make sure protective gear is available and has been replaced/repaired or updated if required. Lead by example and start wearing/using it now. Then you are in a strong position to request/insist your staff do the same.**
- 8. Have a plan around how everyone will get three nutritious meals each day to keep energy levels up. This is especially important for young staff or employees who live alone.**
 - Plan meal breaks into your roster
 - Consider arranging or employing someone to deliver food to the dairy shed or homes to reduce cooking time
 - Keep a supply of healthy snack foods and drinks handy in the dairy shed to provide sustenance throughout the day, e.g. soup, fruit, muffins, bread and sandwich fillings.
- 9. Get organised. You have a huge amount of knowledge in your head about what needs to be done but not everyone in your team has this same knowledge. Create a checklist and get others to help you complete the tasks.**
 - Ensure the calf shed is set up for the calf rearer
 - New bedding material
 - New teats for calfeterias
 - Calfeterias and utensils cleaned
 - Iodine/electrolytes etc purchased
 - Meal, hay and fresh water
 - Order everyday supplies for spring
 - CausMag and limeflour
 - Milk fever treatments
 - Mastitis treatments
 - Filter socks
 - Detergents
 - Organise a calving kit that stays outside of the gate of the calving paddock
 - Refer to page 41 of this booklet
 - Service all motorbikes and machinery, get milking machines checked, order new/change rubberware – breakdowns take time

Do

Once you are in the thick of calving remember to keep focusing on your people with regular communication and feedback. Work through the plan you created and get the job done.

Top tips:

1. Hold regular team meetings. Team meetings simplify things on farm because they ensure everyone gets the same message and you only have to communicate once. They also help keep people involved and provide an opportunity for minor frustrations to be dealt with quickly before they affect morale and productivity.

- In spring, team meetings are usually needed daily
- Use a simple agenda of
 - What happened yesterday?
 - What's happening today?
 - Other

2. Keep talking and provide feedback. Spring is stressful and it is more important than ever to remember the little things that keep people going.

- Communicate, communicate, communicate
 - Often and little to let people know what is going on
- Thank your staff for their hard work and praise their successes
- When something goes wrong take 5 minutes to explain to your staff how it could be improved for next time
- Don't let little issues become big ones. Address them as they come up so everyone stays focussed and positive.

3. Work as a team. Calving is a team sport so get everyone involved. Coach your team to achieve success and celebrate the pool play wins as you go. That keeps motivation and spirits up.

4. Lead by example. Work hard and work smart when you are on farm. But ensure you take time off to rest and recharge. Nothing is more important than your and your staff's health.

5. Eat well and often and encourage your staff to do the same. Being hungry does not help performance. You are not their parent but you can ensure people take regular breaks so they have an opportunity to fuel their bodies.

6. Watch for signs of stress and fatigue, in you and your staff, and be proactive early. Ignoring the problem won't make it go away. When the pressure is on, it is vital to maintain a steady life balance.

- Encourage employees to get off the farm several times a week for a change of scene and do something they enjoy
- Encourage people to take regular breaks throughout the day
- Encourage staff to look after their physical health – eating right, exercising and getting enough sleep
- Lead by example and try to ensure your life is also in balance. For tips on keeping yourself and your team well, visit dairynz.co.nz/wellbeing

Stress symptoms are not the same for everyone but typical symptoms include faster heartbeat, chest pains, indigestion, dry mouth, forgetfulness and shaking. Whilst acute or low level stress symptoms will usually go away it is possible the stress will become chronic and serious if the problem causing them is not dealt with. It can lead to burn-out, fatigue, depression and suicide as well as increase the risk of high blood pressure, stroke or heart attack.

- The Rural Support Trust (rural-support.org.nz or 0800 787 254) can help find options to manage you or your staff through stressful times
- If you or your staff are feeling suicidal contact Lifeline (0800 543 354)
- For more information and advice on depression visit depression.org.nz

7. Keep timesheets for all employees. It's good practice and can save you a lot of headaches in the future.

- Use timesheets to ensure that hours worked are fair, reasonable and safe
- Use timesheets to ensure that all employees receive at least the minimum wage for every hour worked, every week, and maintain these records for seven years.

Go to dairynz.co.nz/timesheets for a template or further information.

Review

Once calving is finished make sure you and your team take a well-deserved break and enjoy it. You have all survived and hopefully your planning and focus on people has helped you achieve better results while minimising stress and angst. Once things have calmed down, but before you forget, take time to review your spring experience with your team. Reviewing things accurately will help set you up for an even better spring next year.

Top tips:

1. Discuss with your team how the season went.

- What worked well?
- What didn't?
- What could be improved for next year?
- Capture the information so you can use it next year in the planning stage so you are building on your learnings.

2. Take time to celebrate the team effort that went into spring

- Think about what is an appropriate celebration or reward for your team
- Remember that words and actions are both important. Ensure your team understand why you are celebrating.

3. Determine the number of hours each person on farm worked over the spring period

- All employees are entitled to be paid the minimum wage for each hour they work over a week. If you find you have underpaid your staff then arrange for a top-up payment to be made.
- For more information go to dairynz.co.nz/people or employment.govt.nz/minimum-wage

Spring is busy on dairy farms and you can't change that. Sometimes it really does feel like it is about survival. Trust your instincts and support your employees to get the best results you can. But remember asking for help is smart farming because you and your team are what keeps your cows healthy and milked, the calves alive and thriving and your farm in top shape.

To get further assistance in getting the best from your team go to dairynz.co.nz/people



Putting people first

Spring pasture and supplement management

Grazing management in the first two months after calving largely determines production to Christmas and how well fed the cows are during mating.

Spring feed allocation – principles

A series of farmlet experiments were undertaken at No. 2 Dairy (Ruakura) in the early 1980s, to establish best practice in pasture management between autumn and early spring. The trial results greatly improved the understanding of optimal pasture management and led to the development of the Spring Rotation Planner (SRP).

- The level of pasture cover at calving is very important. Too much feed will mean that pasture is wasted and growth may be reduced. If there is insufficient pasture, the cows will be underfed, and pasture growth reduced. If there is insufficient pasture the inter-grazing interval is reduced, resulting in pastures being grazed before the 2½ leaf stage. Pasture growth will be reduced and pasture cover will stay low until the summer.
 - Maintaining APC above 1800kg DM/ha in early spring and between 2000-2400kg DM/ha throughout the season will help maximise growth rates.
- Spring feed allocation needs to result in the average pasture cover being lowest on the date when pasture growth is expected to equal feed demand (balance day). The target pasture cover at balance date is dependent on the stocking rate and the pasture demand per cow (influenced by breed and supplements fed).
- Aim to be on the fastest rotation when pasture growth gets ahead of herd demand for pasture (after balance date). The higher the stocking rate, the more important this becomes, especially if supplement available is limited.
- As a general rule of thumb, plan balance date to occur approximately 60 days after the planned start of calving.
- The Spring Rotation Planner is an excellent tool to manage rotation length.

Visit dairynz.co.nz/srp for access to the Spring Rotation Planner tool and the Spring Rotation Planner poster.

Using the Spring Rotation Planner (SRP)

The Spring Rotation Planner (SRP) takes the guesswork out of grazing management over the critical early spring period and allocates feed to ensure that the target cover at balance date (when feed supply equals demand) is achieved.

The SRP allocates a set area per day (or per week) from the planned start of calving to balance date, starting on a slow rotation and speeding up to the fastest rotation planned for the farm in the spring.

The SRP is most effective when actual pasture cover is monitored against target and the rotation is sped up or slowed down to bring the farm's average pasture cover (APC) back on target.

Key pasture management targets in spring are:

1. Average Pasture Cover (APC) at planned start of calving	APC at calving (and supplements available) determines how well the cows are fed for the first two months after calving.
2. Average Pasture Cover (APC) at balance date (when feed supply = demand)	APC at balance date determines the quality and quantity of feed during mating.

TIP - How to get a SRP for your farm

Use the Spring Rotation Planner calculator (either the web-based calculator or download the Excel spreadsheet). Visit dairynz.co.nz/srp.

Setting up the SRP and feed budgeting

The SRP is an excellent tool providing that:

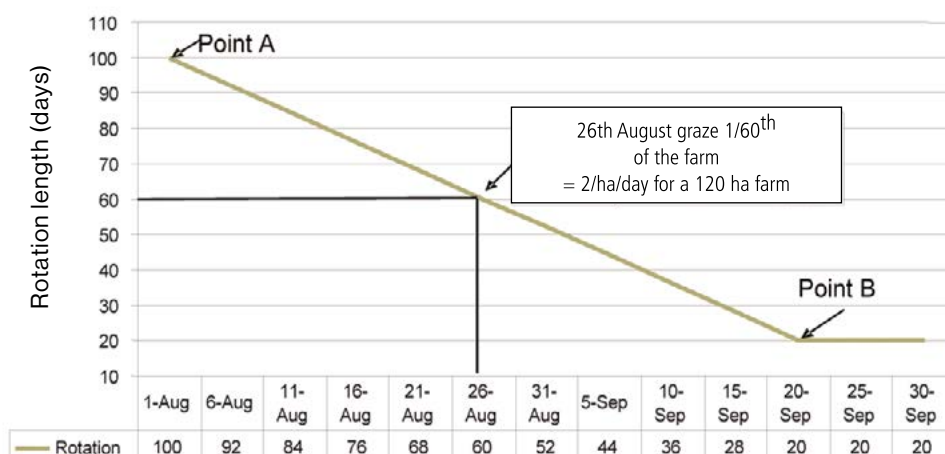
1. The farm has sufficient feed on hand (pasture cover and supplement) to feed the cows until balance date and
2. The timing of balance date and the planned pasture cover at balance date are correct.

Calculating rotation length

To determine the rotation length from the planned start of calving to balance date, a line is simply drawn between the two points as shown in Figure 1.

The two points are the planned start of calving and the expected balance date.

Figure 1. Spring Rotation Planner



Converting rotation length to area grazed

The next step in using the SRP is to convert the rotation length per day into the area grazed daily or weekly.

From Figure 1 on page 15 (the SRP) the area grazed at certain dates for a 120 ha farm can be calculated by dividing the farm area by the rotation length (days) for that date. The results can be plotted on a graph (Figure 2) or put into a table (as per Table 1 on page 19 for the example farm) as follows:

$$\begin{aligned} \text{Point A} &= \frac{120 \text{ ha farm}}{100 \text{ day rotation}} \\ &= 1.2 \text{ ha grazed per day} \\ \\ \text{1st September} &= \frac{120 \text{ ha farm}}{50 \text{ day rotation}} \\ &= 2.4 \text{ ha grazed per day} \\ \\ \text{Point B} &= \frac{120 \text{ ha farm}}{20 \text{ day rotation}} \\ &= 6.0 \text{ ha grazed per day} \end{aligned}$$

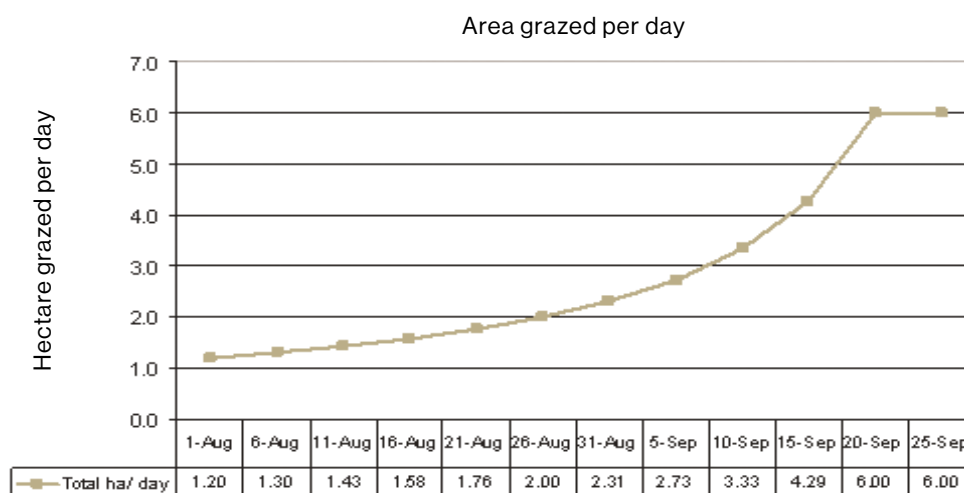
Time from planned start of calving (PSC) to balance date

For pasture-based spring calving systems that use nitrogen in early spring, the time from the planned start of calving (PSC) to balance date is around 60 days. However, on high stocked farms that are not reliant on supplements in spring the time will be 60-70 days and for farms that use high amounts of supplement the time will be 45-50 days.

Area to include in SRP

The effective milking area (all paddocks available at balance date) needs to be included in the SRP. Paddocks set aside for the springers/dry cows during the period from calving to balance date need to be included, as these will be grazed by the milkers on subsequent rotations.

Figure 2. Area grazed each day based on Figure 1 for a 120 ha farm



Rotation length at start of SRP

The rotation length at the start of calving is normally 80–100 days. A slower rotation is required for:

- High stocked farms that are predominately all grass in the spring
- Farms where the period from PSC to balance date is greater than 55-60 days.

Rotation length at balance date

At balance date, a longer rotation will require more feed cover. For farms subject to very volatile growth rates (i.e. 80 kg DM/ha/day changing to 20 kg DM/ha/day the following week), and highly stocked farms not feeding supplement the rotation length should be 23-25 days at balance date. For farms that are either low stocked or have high supplement systems, 18 days may be suitable.

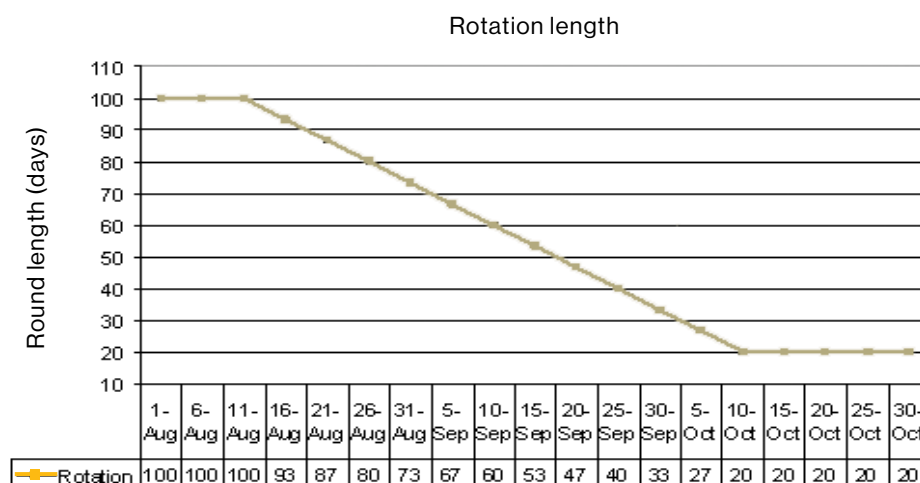
For farms that regularly shut up silage a week to 10 days after balance date, either balance date is occurring earlier than planned and/or the target cover at balance date is too high. If pre-grazing covers are too high (greater than 3000 kg DM/ha), pasture quality is quickly lost and production per cow will be compromised, especially if cows are required to graze to 1500-1600 kg DM/ha (7-8 clicks rising plate meter).

Exceptions to drawing a straight line from PSC to balance date

There are circumstances where a straight line from PSC to balance date is not the best fit. Examples include:

- Where dry cows are grazed off the farm for the first two to three weeks of calving and are bought back as they calve.
- Where a farm has a high 6 week in calf rate and therefore a tight calving pattern. In this case a faster change in area allocated is required early in the calving period, so a steeper line can be drawn from PSC to a mid-calving point. This can be followed by a line with a reduced slope from the mid-point to balance date, slowing the area allocation rate later in the calving period.
- Where the time from PSC to balance date is greater than 60 days. In this situation a straight line should be drawn for the first seven to ten days of the rotation graph. Figure 3 shows how this works for a farm stocked at 4.0 cows/ha with a PSC of 1 August and balance date is 71 days later, 10 October.

Figure 3. SRP for a farm with 71 days from PSC to balance date stocked at 4.0 cows/ha



Monitoring target covers

To get the best value out of the SRP, actual APC needs to be monitored against target APC. This requires having targets for APC from calving to balance date and walking the farm to estimate APC every 7-14 days in the spring.

The target feed covers can be determined by a feed budget or by simply drawing a straight line from the APC target at calving to the APC at balance date as shown in Figure 4 on page 20.

Regular monitoring is required (once or twice each week) of the actual area grazed since PSC. This total can then be tracked against the target area as calculated from the SRP (see Table 1 for an example of this). If for the first 10-14 days at the start of the SRP, less area is used than planned, the saved area can be used to allocate greater areas later in the spring as more cows calve.

Keys to success:

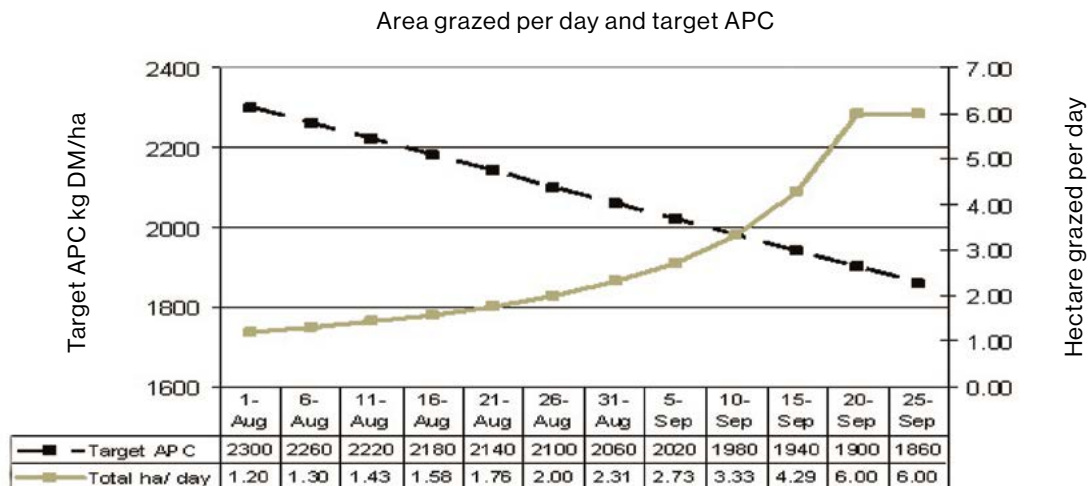
- Be confident in your feed budget and plan
- Monitor actual against target. Know if you are ahead or behind target so you can make a plan to remedy this.
- Check re-growth in your paddocks grazed early in the plan
- Don't panic. Approaching balance date you may only be able to see 2-3 days feed in front of the cows.

Table 1. Example of weekly targets and actual

Week End	Average ha grazed per day	Ha allocated for week	Area used to date	Ha used for the week	Ha grazed to date	Cover end of week	
Monday	Target	Target	Target	Actual	Actual	Target	Actual
01 Aug (Day 1)				1.0	1.0	2300	2400
07 Aug (Day 7)	1.3	9.0	10.2	7	8	2260	2370
15 Aug (Day 14)	1.5	10.2	20.4	9	17	2220	2340
22 Aug	1.7	11.8	32.2	12	29	2180	2280
29 Aug	2.0	14.0	46.3	15	44	2140	2200
05 Sep	2.5	17.3	63.5			2090	
12 Sep	3.2	22.5	86.0			2050	
19 Sep	4.6	32.3	118.3			2010	
20 Sep	6.0	6.0	124.3			2000	



Figure 4. Example farm average pasture cover targets and area grazed per day



Average pasture cover at calving

A formal feed budget for many farms may not be required as there is enough knowledge from previous years to know the pasture cover required at calving and at balance date and to predict balance date. If you are on a new farm then a feed budget is required to determine the amount of feed required (cover, grazing off and supplements) and predict balance date.

Feed budgeting is a prediction based on the best available knowledge. Therefore it is important to gather as much information as possible about growth rates for your farm along with soil temperature, nitrogen (N) applications and to use realistic feed intake estimates that account for conditions that cause feed wastage.

Average pasture cover at balance date

The amount of pasture required at balance date is affected by the stocking rate (SR), demand for pasture and rotation length.

Feed cover at balance date

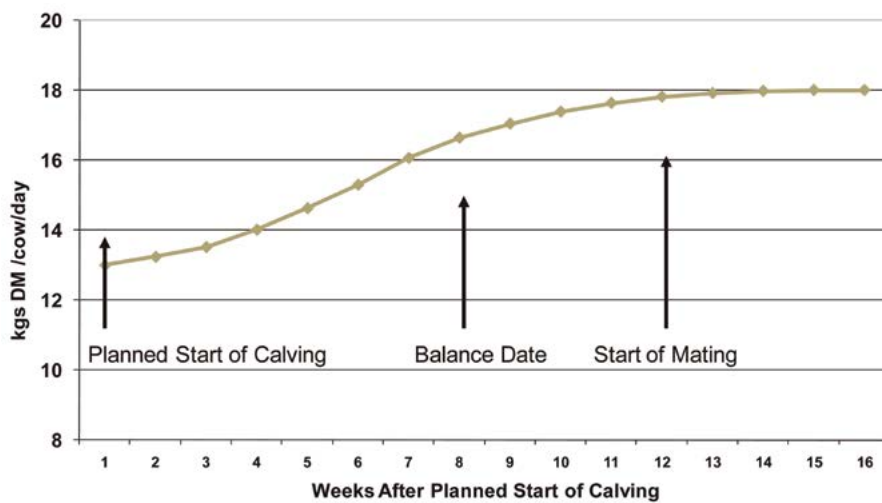
$$= \frac{(\text{Rotation length days} \times \text{stocking rate} \times \text{intake}) + \text{Optimal grazing residual}}{2}$$

Go to dairynz.co.nz/APC for more information.

Feed intakes

Often feed budgets over estimate cow intake requirements at the start of calving. A trial at DairyNZ showed that the average intake of pasture for cows unrestricted in early lactation was only 13.5 kg DM/cow/day for the first five weeks of lactation. Cows can reach their peak milk production per cow in as little as four weeks after calving but peak dry matter (DM) intake doesn't happen until 7-10 weeks after calving. Therefore average herd intake requirements lag behind the peak intake requirements of the early calving cows, as not all cows calve on the same day (Figure 5). However, these intakes do not allow for wastage and need to be increased especially if conditions are wet or feeding supplements. In wet weather it is very easy to underfeed cows.

Figure 5. Average daily intake per cow on a herd basis, based on cows reaching peak intake of 18kg DM/cow/day by week 7 after their calving date



In the spring it can be difficult to find the time to monitor APC. However, the key to managing pasture allocation in spring is knowing what cover is on the farm. A weekly or fortnightly farm walk can actually save you time by allowing you to plan grazing a week ahead from the longest to shortest paddock list. If you don't have time to assess the cover on all paddocks of the farm consider:

1. Employing someone to do the assessment weekly or every two weeks, or
2. Estimate the cover in six longest and six shortest paddocks and calculate the average pasture cover. For this system you need to know your farm well enough to know which are the six longest paddocks. If the feed wedge has an irregular shape, it can give a misleading answer. However, it is better estimating, than not doing any monitoring and this provides information as to whether you need to change feed allocation to meet targets.

How to allocate feed

Once you have your target of area grazed per day, management can be simplified by averaging out the area to be grazed every 4–7 days rather than working on a daily target as shown in Table 1 on page 19.

Balancing cow condition and pasture cover at calving

Balance cow condition with pasture cover at calving. Aim to get 85% of your cows to body condition score (BCS) 5.0 for mixed age cows and 5.5 for heifers and R3. In relation to BCS, the greatest return from extra feed is from increasing the BCS of the lightest cows as shown in Table 2 below. Sort mobs and feed better-conditioned cows maintenance.

Table 2. Reproduction and milksolids benefits associated with body condition score for a 500 kg Lwt cow

BCS change	MS response kg MS	\$5.50/kgMS	Repro benefits (over two seasons)	Total \$/BCS
From 3.0-4.0	18.0	\$99	\$40	\$139
From 3.5-4.5	12.5	\$69	\$40	\$109
Rule of Thumb	15.0	\$83	\$40	\$123

Aim to get APC at calving to minimum of 2100 kg DM/ha.

The trade-off between BCS and Average Pasture Cover.

What is preferable?: Average BCS of 5 for mixed aged cows and 5.5 for heifers and R3 at calving with a pasture cover of 2000 kg DM/ha **or** Average BCS 4.5 for mixed age cows and 5 for heifer and R3 at calving and pasture cover of 2200-2400 kg DM/ha.

If resources and facilities are available to introduce supplements, gibberrellic acid and nitrogen fertiliser in the spring, then the aim could be to achieve BCS 5, and calve with a slightly lower pasture cover. The certainty of BCS target is met, and pasture growth uncertainty is dealt with by adding supplements and growth stimulants.

If introducing feed or accelerating pasture growth in the spring is not an option then restricting BCS to 4.5 average and aiming for a higher pasture cover target is appropriate. This results in better feeding in the spring which can counter the losses from reduced BCS at calving.

Management plays an important role in each scenario. Examples of good production and reproduction performances by farmers who have run both these scenarios are reported.

Tips in order to make the most of each scenario:

- Splitting cows based on BCS to ensure that feed is going into the right cows
- Strict adherence to feed budgeting and monitoring
- Strict use of SRP tools to allocate feed
- Planning ahead for imported feed and nitrogen use.

Month before calving

A month out from calving the priority needs to be building APC. Two years of trials at DairyNZ show a loss of about 0.2 BCS units and 4 kg MS/cow for cows fed 50% of their energy requirements each day during the last month before calving. A similar restriction (in kg DM terms) after calving cost 30 kg MS/cow.

Strategies when average pasture cover is below target

When APC is below target, break down the problem to manageable bits:

- Face your situation – walk the farm, confirm the size of any deficit and develop a plan on how to fill the deficit for the next two weeks
- Share your plan, seek advice
- Monitor actual pasture cover weekly and adjust plan weekly or fortnightly.

Where cover is below target there are a number of options, provided that animal welfare is not compromised. These are summarised below:

- Do not speed up the rotation
- Prioritise intake to the most vulnerable stock: colostrum; milkers; springers then dry cows
- Feed supplements to build cover
- Apply nitrogen and/or gibberlalic acid
- Minimise pugging damage to protect future re-growth.

Do not speed up rotation

If the actual APC on the farm is below the target then the quickest way to get back on track is to hold the rotation length and not speed up, (as per the rotation planner), until APC is back on target. When this is achieved the area allocated daily is as per the SRP for the current date.

Using Figure 4 (page 20) as an example, if actual APC on the 11 August is only 2100 kg DM/ha (compared to target of 2220 kg DM/ha) then the round length needs to be held at 84 days (Figure 1) and only 1.43 ha grazed per day (Figures 2 and 4) until the APC is back on line. If by 26 August the APC is 2125 kg DM/ha the area allocation goes back to the original plan of a 60 day rotation (Figure 1), grazing 2.0 ha per day (Figures 1, 2 and 4).

If average pasture cover is below target or there is insufficient feed for the milkers there are three options:

1. Supplement the dry cows, and restrict their pasture allocation.
2. Supplement the milkers to achieve a consistent, even grazing residual. In early spring (this is 7 clicks on the rising plate meter for ryegrass/clover pastures or 1500 kg DM/ha using the formula “clicks” x 140 +500).
3. Dry cow intake is reduced to allow more feed to be allocated to the milkers.

Ideally, option 3 should not occur (except where there are unexpected weather events that result in pasture being below target or where previous management has not set the farm up well for spring). DairyNZ does not encourage systems that consistently need to underfeed cows. However, should pasture cover be below target then the damage must be minimised by recognising and prioritising the most vulnerable stock.

Prioritise feeding

If cows have to be restricted due to APC being short of target, restrict cows at the start of the calving period to minimise the impact. Where option three has to be taken then the priority for feed allocation is:

1. Colostrum cows
2. Milking cows
3. Springers
4. Dry cows

The longer the period of underfeeding, the greater the loss in milk production.

The aim is to feed the colostrum cows and milkers at least 12 kg DM/cow for Friesians and 10 kg DM/cow for Jerseys grazing to 1500 kg DM/ha. However, when the farm does not have the resources to feed to these levels the milkers can graze lower. Milkers must be offered a minimum of 10 kg DM/cow for Friesians and 8 kg DM/cow for Jerseys. These feeding levels will reduce subsequent milk production and pasture re-growth. The extent of the carry over effect on milk production from underfeeding depends on the length of time cows are restricted and graze below 1500 kg DM/ha. The dry cows and springers then get the balance of area. However, these stock must be fed at least 5.0 kg DM/cow. Where the minimum feeding levels given above cannot be met, supplement must be purchased or stocking rate reduced.

If possible, get late calvers and any dry stock off the farm. Review cow numbers and cull any cows that are just making up the numbers. However, do not reduce numbers to the extent that you limit the potential production for the season.

For more information, go to dairynz.co.nz/APC.

Options to increase feed

Use supplements to build cover

Use supplements to build pasture cover, not just for milk in the vat. Cost out whether there are supplements available that are profitable to feed at the milk price predicted for the season. Urgently seek a system to feed supplements that minimises waste and is practical.

Apply nitrogen

Apply nitrogen to boost growth providing the soil temperature is greater than 7°C and the soil isn't saturated. Adding gibberalic in conjunction with nitrogen is a cost effective option for increasing available feed. On some soil types if soil temperatures are low then applying nitrogen fertiliser containing sulphate is preferred. Sulphur may also be limiting where there has been a lot of leaching (heavy rain on free draining soils) or where soil temperatures are less than 10°C (low sulphate levels are due to the lack of microbial activity to convert sulphur to sulphate). Where sulphate is limiting, use a mix of sulphate of ammonia (SOA) and urea, or any fertiliser that contains sulphate and can be safely mixed with urea.

Minimise pugging to protect future growth

Use an appropriate stand-off area to avoid pugging and over grazing. (Over-grazing is occurring when residuals are less than 1100 kg DM/ha for dry cows and 1500 kg DM/ha for milkers). Avoid effluent run-off from stand-off areas into waterways.

Once a day milking is an option to save time and improve cows' energy status in the spring but it comes at a cost as it reduces the potential milk production for the season. For more information see the OAD section on page 38.

Strategies when average pasture cover is above target

Should APC be above target and the accumulated area grazed 3-4 weeks into calving is less than that allocated by the SRP, the rotation can be sped up by increasing the area offered and/or either stopping feeding supplement, providing that cows are still grazing to a consistent even residual. Where target grazing residuals cannot be achieved it may be necessary to take a light crop of silage to restore APC back to target and get the paddocks back in the rotation. Apply N after harvest as an insurance. The quality of silage made in early spring may not be ideal but it is more important to maintain pasture quality. Where paddocks are shut up for long periods in early spring, the quality of the silage is often poor and there can be long term damage to the paddock by opening up the sward. Growth rates will also be reduced and if eventually harvested, can create a deficit. If harvested by the cows they will have to eat rank, poor quality pasture just when cows are coming to peak cow intake. Therefore the best option may be to take an early, light crop of silage and restore the APC to target, thereby maintaining pasture quality and maximising pasture growth rates.

APC on target – milkers get the area remaining after area allocated for the dry cows

To use the following method, the APC needs to be on target and assumes that the target cover has been calculated correctly i.e. there will be sufficient pasture for all mobs of stock. Where this is the position, the area allocated for the dry cows/springers and colostrum cows can be allocated first, based on set square metres per cow with the milkers getting the balance of the area as per the SRP.

To simplify the exercise of allocating area to various mobs, the area for the dry cows and colostrum cows can be worked out at the start of calving on an allocation of square metres per cow based on the average pasture cover that the dry cows and colostrum cows are likely to graze. This can be re-calculated during the spring if the pre-grazing covers alter markedly from the original calculations.

For example where the dry cows are being offered 3800 kg DM/ha grazing down to 1200 kg DM/ha, they are being offered 8 kg DM/cow from pasture and 2 kg DM/cow from hay. The area offered per dry cow is 31m² calculated as follows:

Pre-grazing cover		3800 kg DM/ha
Less residual		<u>1200 kg DM/ha</u>
Available feed	=	2600 kg DM/ha

$$2600 \text{ kg DM/ha} \div \text{by dry cow intake } 8 \text{ kg DM/cow} = 325 \text{ cows/ha}$$
$$10,000 \text{ m}^2/\text{ha} \div 325 \text{ cows} = 31 \text{ m}^2/\text{dry cow}$$

The same exercise can be done for the colostrum cows. For example if the colostrum cows are offered 3500 kg DM/ha grazing down to 1500 kg DM/ha, being offered 11 kg DM/cow from pasture and the area offered per colostrum cow is 55 m² calculated as follows:

Pre-grazing cover		3500 kg DM/ha	
Less residual		<u>1500 kg DM/ha</u>	
Available feed	=	2000 kg DM/ha	

2000 kg DM/ha ÷ by colostrum cow intake 11 kg DM/cow	=	182 cows/ha
10,000 m ² /ha ÷ 182 cows	=	55 m ² /colostrum cow

The allocation to the milkers is then easily calculated. The milkers get the balance of the area after feeding the dry cows and colostrum cows. For the farm example in Figure 1 (page 15), on 6 August the area and intake for the milkers is calculated as follows:

11 August

Area allocation	(as per Figure 2,4)	=	1.43 ha
Dry cows	234 dry cows at 31 m ² /cow	-	0.72 ha
Colostrum cows	36 cows at 55 m ² /cow	-	<u>0.20 ha</u>
Area for milkers	90 milkers	=	0.51 ha

Milkers

Pre-grazing cover		3500 kg DM/ha
Less residual		<u>1450 kg DM/ha</u>
Available feed	=	2050 kg DM/ha
Allocation for 90 cows	=	2050 x 0.51 ha
	=	1046 kg DM
Allocation per cow	=	1046 ÷ 90 milkers
	=	11.6 kg DM/cow

As these cows have only been calved for two weeks at the most, an intake of 11.6 kg DM/cow/day is marginal. The check on the farm is to observe residuals and check when the cows reach the target grazing residual. If the milkers have grazed lower than 1500 kg DM/ha (7 clicks on the plate meter) or have cleaned out their break within three hours, they have been underfed and supplementation is an option (refer to pages 32-37 for more information on feeding supplements).

TIP - Use the form overleaf to do the above calculations.

Area for dry cows and springers

Pre-grazing cover	A	A
Less residual	B	B
Available feed/ha	$A - B = C$	C
Dry cow pasture intake kg DM/cow/day	D	D
Dry cows/ha	$C \div D = E$	E
m²/dry cow	$10000 \div E = F$	F

Area for colostrum cows

Pre-grazing cover	G	G
Less: residual	H	H
Available feed/ha	$G - H = I$	I
Colostrum pasture intake kg DM/cow/day	J	J
Colostrum cows/ha	$I \div J = K$	K
m²/dry colostrum cow	$10000 \div K = L$	L

Area for milking cows

Total area allocated from the SRP				M
	No head	m²/cow		
Dry cows	N	F	$N \times F \div 10000 = O$	O
Colostrum Cows	P	L	$P \times L \div 10000 = Q$	Q
Area for milkers			$M - O - Q = R$	R
Pre-grazing cover			S	S
Less: residual			T	T
Available feed/ha			$S - T = U$	U
Total pasture available			$R \times U = V$	V
No. of milkers			W	W
Pasture intake for milkers kg DM/cow/day			$V \div W = X$	X

Maximising pasture growth rates

Minimising pugging

Pugging will lower pasture growth rates for the next 3-4 months at least. NIL PUGGING DAMAGE is the target. If very wet, stock must be on off grazed (this includes milkers). Milkers can eat their daily allocation in two grazings of 4 hours each. In order of priority, stand-off dry cows, springers if they can safely calve on the stand-off area, and then milkers.

When standing off, you need to teat spray the dry cows 2-3 times per week due to the udder hygiene challenges associated with mud and stand-off areas.

Block graze rather than strip graze. Walk the herd out of different gates if possible. Where possible start grazing at the back of the paddock and walk stock in and out of paddocks on long grass. Use an appropriate stand-off area to avoid pugging and over grazing (less than 1100 DM/ha). See dairynz.co.nz for more information.

What the research says

A Taranaki trial was carried out in the winters of 1982 and 1983 by TARS which illustrates the benefits of good wet weather management grazing strategies as shown in Table 3.

Table 3. Taranaki trial

Grazing strategy	Pasture production (kgDM/ha)	% Decline
Mown	2030	0
On / Off (4 hr On & 20 Off)	1980	2
Block (24 hour)	1680	17
Strip (5 days)	1440	29

This trial clearly shows that provided cows could be moved on and off with minimal damage to pastures, an “on/off” grazing system improves re-growth and would be recommended.

Strip grazing under any circumstances would not be recommended.

The effect of rotation length on pasture growth

What the research says about maximizing growth rates

In the early 1980s a trial at Dairy Research Corporation's No. 2 Dairy looked at the impact of starting with two levels of pasture cover at calving and herds on either a slow or fast rotation after calving (Figure 6).

The herd that started with low cover at calving but went slow had the same cover at balance date as the herd that started with sufficient (high) cover at calving. This compares with the herd that started with a low cover at calving and was on a fast rotation after calving, with the pasture cover on the farm not recovering until December. The low cover at calving herd that was on a fast rotation recovered slowly as the growth rates were reduced due to the fast rotation. Pastures were grazed when there were only 1-2 leaves, when the ideal is 2.5-3 (Figure 7).

Figure 6. Effect of speed of rotation on average pasture cover (kg DM/ha)

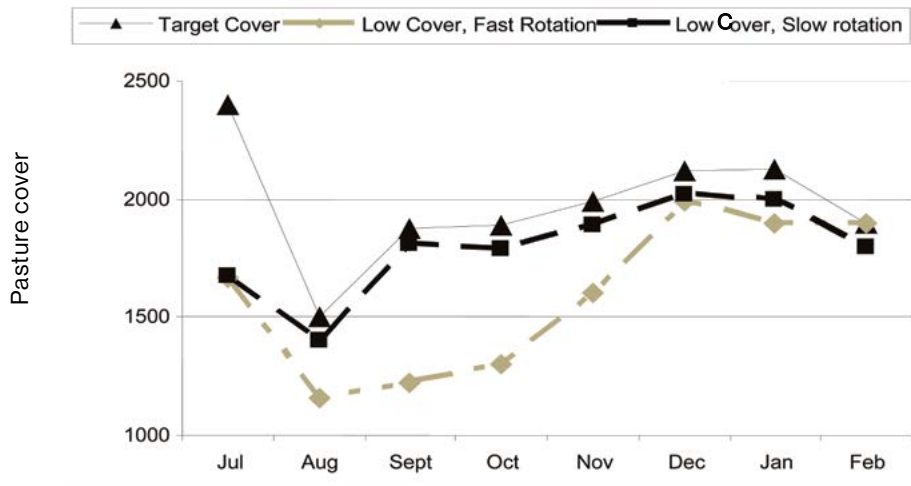
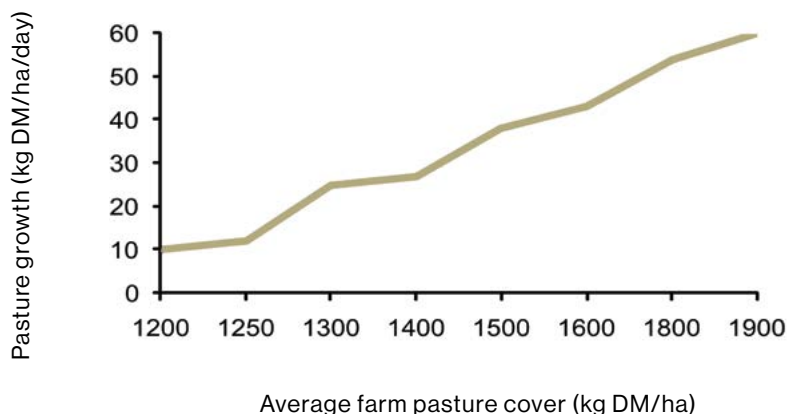


Figure 7 shows the effect in early spring of different rotation lengths that resulted in a range of average farm pasture covers. The higher the APC, the higher the potential pasture growth, due to a reduced frequency of grazing (grazed after 2½ leaves).

Figure 7. Average farm cover in spring and the effect on pasture growth



Research conclusion

- It is essential not to speed up the rotation too quickly after calving. Aim to be on your fastest spring rotation at balance date when daily pasture growth equals daily feed demand. If short of feed at calving this is even more important and the rotation after calving needs to be kept slow and either cow intakes restricted or supplement fed to make up the difference.
- If the farm is on a fast rotation and plants are grazed before the third leaf emerges, the result can be APC dropping below 1900 kg DM/ha. Pasture growth rates will be reduced as shown in Figure 7. Grazing a paddock down to 1000 kg DM/ha does not reduce growth rates providing the paddock is not grazed again before the third leaf stage or pasture is not damaged in grazing to 1000 kg DM/ha. That is, the frequency of grazing reduces pasture growth, not intensity of grazing.
- A slow rotation that keeps APC above 1800 kg DM/ha is important to maximise pasture growth in the spring.

TIP - For more on the Spring Rotation Planner visit dairynz.co.nz/srp

Practical solutions to manage spring feed

- Feed budget with the best information available to ensure that feed supply meets demand. It helps to know the actual area in grass for each paddock
- Target pasture cover at calving is key
- Feed budget on feed offered i.e. allow for wastage especially if on a wet farm
- Review calving date, stocking rate, supplements and nitrogen use if short of feed every spring
- Use the spring rotation planner (SRP) or weekly feed budget to generate pasture cover targets
- If on a wet farm add five days to your first rotation target to give you some extra area that can be used to speed up the rotation when wet
- Monitoring and altering the plan to keep on track is key to managing spring feed – set up systems to monitor pasture cover at least fortnightly against target
- Record paddocks grazed daily; allocate area weekly and monitor accumulated area grazed to date against actual area allocated on the SRP every week
- Identify mobs based on body condition score and calving date in early winter and mark for easy drafting
- Appoint someone in the team to keep tally of cows in each mob daily and stress the importance to everyone of knowing how many cows are in each mob
- Always have the next day's break set up – reels and standards are cheap
- Plan when to feed supplement that matches work load – often feeding out is easier at the end of first rotation because workloads are not as tough, providing supplement is excellent quality
- When there are multiple mobs early in the calving period, allocate paddocks handy to dairy for early milkers. Allocate paddocks for colostrum cows away from the calf shed.

The 10 commandments of supplementary feeding

There has been an ongoing debate on the benefits, or otherwise, of supplementary feeds in New Zealand, with the general result being confusion about what to do. Decisions on when to feed supplement and make money are not complicated providing you stick to the key principles:

1. **Cost of milk production (\$/kg MS) is the primary driver of profitability in New Zealand dairy farming.**

The rule of thumb based on DairyNZ research results is that the maximum price that can be paid for a supplement is 0.45% of the MS price/MJ ME. In other words, when milk price is:

\$7.50/kg MS, the maximum price paid for supplements should be $(0.45 \times 7.50) = 3.4\text{c/MJ ME}$. This means:

- an 11 MJ ME supplement should be purchased for less than \$375/tonne DM
- a 12 MJ ME supplement should be purchased for less than \$410/tonne DM.

\$5.50/kg MS, the maximum price paid for supplements should be $(0.45 \times 5.50) = 2.5\text{c/MJ ME}$. This means:

- an 11 MJ ME supplement should be purchased for less than \$275/tonne DM
- a 12 MJ ME supplement should be purchased for less than \$300/tonne.

2. **Spring, autumn and winter pastures tend to be excellent feeds for dairy cows.** They are highly digestible (75-85%) when proper grazing management is employed. They have sufficient high quality protein to allow cows to produce up to 2.5 kg MS per day and they have adequate levels of fibre. Therefore, when you have sufficient pasture, you do not need to supplement.

3. **Sufficient pasture is defined as the amount of pasture required to maintain the appropriate grazing rotation for the time of the year AND the correct post-grazing residual – even, consistent, grazing height (3.5-4cm = 7-8 clicks on the rising plate meter for ryegrass clover pastures).** The key to achieving these residuals is to get the quality and amount offered right i.e. pre-grazing cover. When cows are offered more than 3000 kg DM/ha (winter platemeter formula) it is hard for cows to achieve the target residual without compromising production. This is not an issue for high stocked farms.



- 4. If you have sufficient pasture and you offer cows a supplement, they will waste pasture (substitution).** This will reduce pasture utilisation and quality of pasture re-growth, and ultimately profitability.
- 5. If you do not have sufficient pasture, cows will produce more milk if you offer them the correct supplement. The first limiting nutrient for a grazing cow is energy.**
- 6. Energy can be provided by carbohydrate (fibre, starch, sugar), fat, or protein.** However, if two feeds have the same amount of ME, the supplement with more soluble sugars and starch (SSS) will generally produce more milk protein and less milk fat than the fibre-based supplement. Therefore, when purchasing a supplement you need to firstly find the least expensive (per MJ ME), high quality (greater than 10.5 MJ ME/kg DM) form of energy that you can store and feed out with minimal waste and secondly consider the milkfat and protein response from the supplement. Refer to DairyNZ Technical Series June 2011 for more information on the price to pay for a range of feeds.
- 7. The MS response to supplements on many New Zealand dairy farms is less than it could be.** This will not improve by changing the supplement being fed. The response to supplements depends largely on how hungry the cow would be if she wasn't supplemented. Increased hunger means a greater response to supplements. For example, if grazing residuals are 1200 kg DM/ha without supplement, the immediate response to supplements would be about 12 g MS/MJ ME eaten. However, as residuals rise, the response to supplement drops. So, if the first 3 kg supplement lifts residual to 1500 kg DM/ha, more supplement will only result in a response of 7-8 g MS/MJ ME. As residuals rise further due to cows refusing pasture (substitution), responses will drop to 3-3.5 g MS/MJ ME when residuals are about 1800 kg DM/ha. In recent case studies, the average estimated response to supplements on NZ dairy farms is about 4-5g MS/MJ ME. This indicates that there is poor utilisation of supplements or pasture (i.e. residuals of greater than 1600-1700 kg DM/ha). In such situations, supplements are being fed to dairy cows that probably do not need them.
- 8. Supplements (of any type) are unlikely to reduce empty rates if you have sufficient pasture.**
- 9. Grazing cows do not require supplementary fibre.**
- 10. Avoid unnecessary expenditure on depreciating assets.**

TIP - There is no magic associated with using supplements. Feed energy supplements only when there is insufficient pasture. Purchase them cheaply. Minimise wastage of supplement. Avoid unnecessary capital costs.



Milk response to supplements

Use supplements to improve pasture management. They should be used to:

- Extend rotation length to grow more grass
- Ensure grazing residuals are not lower than 1500 kg DM/ha (7 clicks on the rising plate meter (RPM)).

Their true value is in getting another day in the rotation rather than just another litre in the vat. Estimate the price you can afford to pay for supplement where you will make a profit of, for example \$50/t DM offered, taking into account the milkfat and protein response, feeding costs, labour and capital outlay (if required) and the wastage of the supplement.

Look for every opportunity to reduce wastage when feeding supplements; this improves milk production, responses to supplements and helps bring down the cost of feed eaten. It also makes feed reserves last longer.

Table 4 below gives an indication of the energy value, wastage and other considerations for a range of feeds. Where feeding “unusual” feeds (e.g. avocados, parts of which are poisonous; or lawn clippings) consult with your advisor, DairyNZ regional partner or vet.

Table 4. Supplements: Estimated feeding out costs, wastage and other considerations

Supplement	MJ ME /kg DM	Estimated wastage feeding out	Estimated milkfat: protein	Other
Potatoes	13.0	20%+	15:85	Not suitable as milking cow feed unless diet short on fibre but can make part of a dry cow ration. May be required in diet to meet fibre requirements, especially if diet high in sugar/starch and little long chop silage, hay or pasture available..
Meal (Depending on constituents)	12.0-12.5	10%+ 5% pelletised	50:50	Moderate to high risk of acidosis. Need to introduce slowly and feed so individual cows can't gorge. Can get intakes of up to 3 kg DM/cow/feed.
Molasses	11.5	10-15%	20:80	High risk of acidosis. Max intake 1.0-1.5 kg DM/cow (i.e. 2 l/cow). Introduce gradually. Very low milk production responses when fed with lush pasture.
Barley	12.0	5% in shed feeding	25:75	Moderate to high risk of acidosis. Need to introduce slowly and feed so individual cows can't gorge. Can get intakes of up to 3 kg DM/cow/feed.
Palm kernel	11.0-11.5	Feed in bins 10-20%; feeding in paddock 30%+	75:25	Needs to be available to cows when grazing to encourage intake when first introduced. Ideally no more than 30% of the diet; severe feed deficits max intake 50% of diet, balanced forage. Cows need water all day at high intakes. No major animal health risks. At high intakes review copper supplementation PKE is a very efficient feed for liveweight gain during the dry period. In severe deficit consider FEI levels in milk.

Supplement	MJ ME /kg DM	Estimated wastage feeding out	Estimated milkfat: protein	Other
25% Tapioca; 75%/PKE	11.5	Feed in bins 10-20%; feed in paddock 30%+	60:40	Moderate risk of acidosis, especially if poorly mixed. Reduced by minimising tapioca to 25% of mix and good feed management.
Silage / baleage	9.0-11.5 Quality varies widely	20%+	70:30	Silage and baleage often not 10.5 ME and therefore not suitable as milking feed. Suitable feed for dry cows, or if no long-chop feed available for milking cows (to reduce risk of acidosis). Cost varies depending on size of bale, wastage and ME.
Maize silage	10.0-11.0 Average 10.5 ME	20%+	45:55	Can feed up to 40% of diet to milking cows and 50% of diet for dry cows if the pasture is 25% crude protein. For short periods (up to a month) can feed up to 80% of diet for dry cows. At high intakes require supplementation with Ca, Mg and Na.
Cereal silage	8-11	20%+ good quality 30-40% poor quality	45:55	Like maize, not all regions in NZ are suited to growing quality cereal silage and to get high ME crops requires top management (small harvesting window). Can get high wastage if poor quality.
Hay	8-9	20%+	70:30	Suitable feed for dry cows, or when fed to reduce risk of acidosis.
Straw	6-7	20%+	-	Not suitable as milking cow feed unless diet short on fibre but can make part of a dry cow ration. May be required in diet to meet fibre requirements, especially if diet high in sugar/starch and little long chop silage, hay or pasture available.
Onions	11	20%+	50:50	Feeding may cause anaemia, cows may also choke, and risk of milk taint.
Kiwifruit	12-12.5%	20%+	45:55	Intake must be increased gradually over 2-3 weeks. Up to 3 kg DM/dry cow/day (15 kg fruit/cow/day) can be fed to dry stock but this needs to be reduced to 5 kg fruit/cow/day if fruit is ripe. Milking cows have been fed up to 5-6 kg DM/cow/day without obvious problems but only where cows have a high intake of pasture (10-12 kg DM/cow/day). As kiwifruit is high in soluble sugars there is a high risk of acidosis when fed to excess. There is also a risk of animals choking especially when fruit is hard.

Where grazing residuals are less than eight clicks on the rising plate meter, supplements are an option. The return from supplements depends on the milk price, the severity and length of time of the feed deficit, and the quality and utilisation of the supplement as shown in Table 5 and 6.

Table 5. Milk response to supplement offered (purchased) in spring

The following table provides the estimated response to supplement purchased under a range of conditions. The response rates allow for wastage of the supplement in storage and some wastage in feeding out.

Response g MS/MJ ME	g MS/kg DM at 11ME	Residuals and average pasture cover (APC) ¹	Supplement	Other
<3.0	<30	9.5 clicks or 1,800 kg DM/ha. At or above APC target.	Quality < 10.5 ME; Wastage 30% plus (fed in wet weather; poor stack management).	Pasture quality in subsequent rotations poor and less pasture grown.
3.5-5.5	40-55	8-9.5 clicks (1,600-1,800 kg DM/ ha); stop feeding at target APC.	Average quality 10-10.5 ME; Wastage 25%-30%.	Supplement feeding stopped too late creating surplus.
5.5-7.5	60-80	6.5-7.5 clicks (1,350- 1,550 kg DM/ha) if supplement not fed; residuals <8.0 clicks when supplement fed.	Good quality 10.5-11.0ME; Wastage 20% or less.	Short term feed deficit (<10 days). Supplement feeding stopped before APC cover target achieved.
8.0-12.0	90-130	Residual < 6 clicks (1,350 kg DM/ha) if supplement not fed. When supplement fed residuals 6-7 clicks (1,350-1,500 kg DM/ ha); APC well below target (> 300 kg DM/ ha deficit).	Good quality > 10.5 ME Low wastage 15% or less (feeding maize or PKE in bins / on feed pad).	Cows grazing to < 6 clicks for 10 days plus; supplement feeding stopped in anticipation of target cover being met. Responses increase with the period of severe underfeeding (8 g MS/MJ ME at least 2 weeks; 10 g MS/MJ ME 4 weeks; 12 g MS/MJ ME 5 weeks).

¹ One click = 0.5 cm compressed height

Table 6. Estimates of % wastage rates in storage and feeding out¹

Wastage is often under-estimated on farm and has a big impact on the profitability of supplement use. Here are some guidelines for estimating wastage.

Supplement	Storage			Feeding out paddock ²			Feeding out bins ³	
	Excellent	Average	Poor	Excellent	Average	Poor	Very good	Poor
Grass silage (%)	5	10-15	20-40	10	20	40	5-10	25 ⁴
Maize & cereal silage (%)	6	10-15	20-40	15	25	40	5-10	25 ⁴
Palm kernel (%)	<2	10-15	20	25	30	50	10	25
Concentrates (%)⁵	<2	5	15				5	25

¹ As research on wastage of supplements is limited, the above are based on best estimates from scientists and industry experts

² Includes losses at the stack face and when loading the wagon

³ Bins = Feed trough for PKE fed in the paddock or feed pad for forages or in-shed feeding for concentrates

⁴ Excludes refusal in the bin for rotten silage

⁵ There are additional losses feeding concentrates e.g. small grain losses up to 40% as grains are undigested by the cow. There are also losses when grains are digested whole.

Once a day milking (OAD)

Once a day (OAD) milking is an option to save time and improve cows' energy status in the spring but it comes at a cost as it reduces the potential milk production for the season.

OAD milking has become popular in early lactation to allow farmers to get systems in place to manage springers, colostrum cows, calves, animal recording, difficult weather conditions and a shortage of labour during this time. These are valid reasons to milk cows OAD in early lactation, however the DairyNZ research (2010) has shown that even short periods (3-6 weeks) of OAD milking has significant milk production costs, with no effect on body condition score (BCS) loss, or reproduction.

OAD is an option in spring... but it comes at a cost. DairyNZ advises farmers considering milking OAD in early lactation to be cautious and to consider the full effects of milking OAD in your farm situation carefully.

DairyNZ key messages:

- Milking once a day (OAD) for a short period in early lactation can reduce a cow's potential to produce milk throughout lactation.
- The total production loss depends upon the duration of OAD and is due to both immediate and long-term reductions in daily milksolids (MS) yields:
 - cows milked OAD for three weeks in early lactation produce approximately 8% less total MS over the entire lactation
 - cows milked OAD for six weeks post-calving produce 12% less total MS over the entire lactation.
- OAD milking post-calving improves cow energy status, but there is very little improvement in body condition score (BCS) until after five to six weeks in milk.
- Milking cows OAD during a temporary feed shortage in early lactation decreases MS yield by more than the feed restriction on its own. While OAD milking improves cow energy status during a feed restriction, it does not prevent BCS loss.
- Although OAD milking reduces potential MS production, it allows farmers more time to focus on other important management issues (i.e. springers and colostrum cows, labour shortages, difficult weather conditions and feed allocation). Depending upon the individual farm system, the benefits from getting these management decisions right could offset the negative effects of OAD on cow milk production.

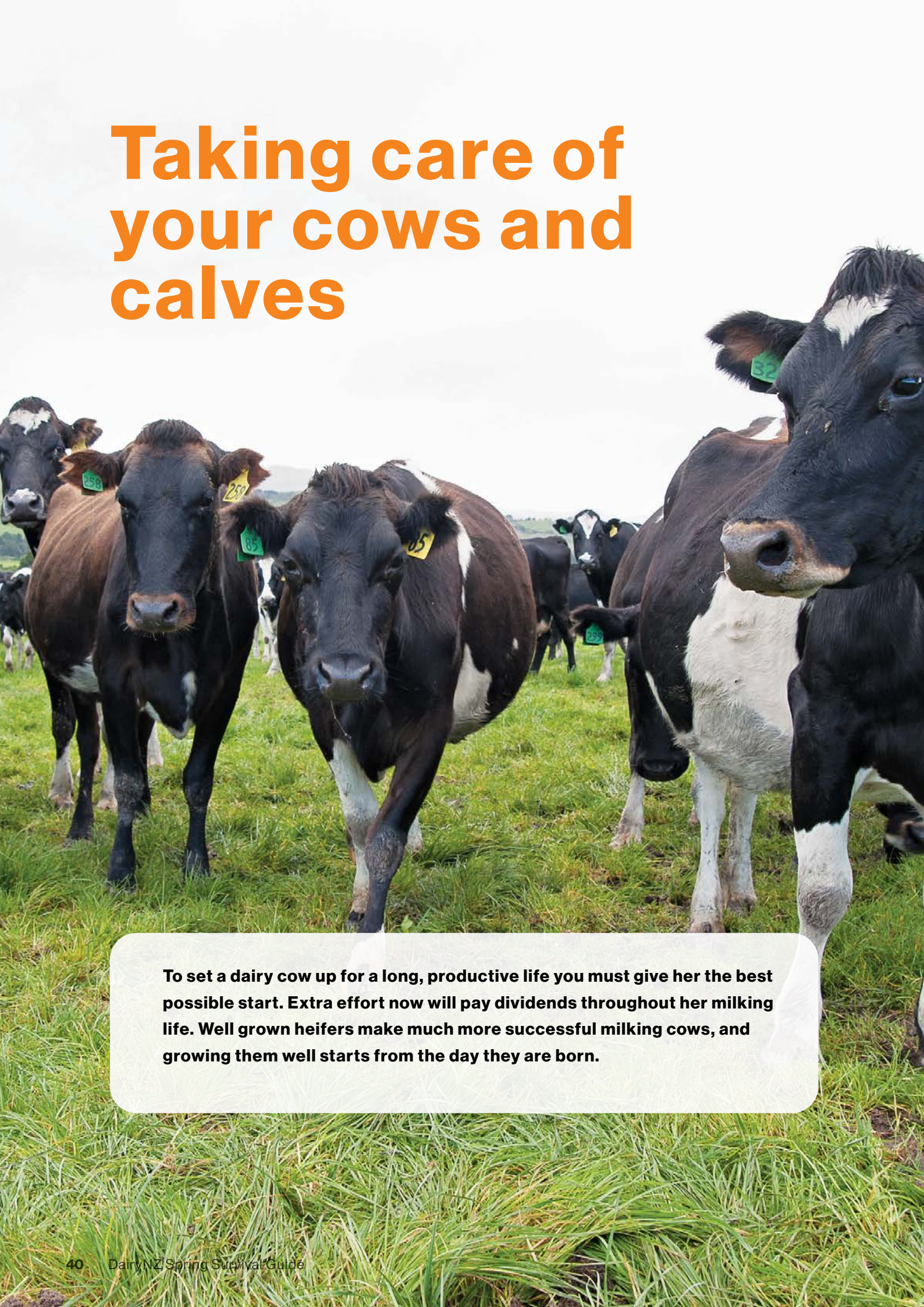
Implications for farmers

Milking cows OAD for a short period in early lactation results in lactation-long reductions in MS production, but allows more time for working on other aspects of the farm system, such as grazing management and animal health. Improvements in these areas will depend upon individual farms, but can help offset the negative effects of OAD milking on lactation production potential.

TIP - find out more about milking OAD in early lactation in the OAD milking section on the DairyNZ website: dairynz.co.nz/oad



Taking care of your cows and calves

A group of dairy cows, including several calves, are standing in a lush green field. The cows have various patterns of black, brown, and white. Some have ear tags with numbers like 258, 85, and 32. The background shows a hazy landscape under an overcast sky.

To set a dairy cow up for a long, productive life you must give her the best possible start. Extra effort now will pay dividends throughout her milking life. Well grown heifers make much more successful milking cows, and growing them well starts from the day they are born.

Get calf pens and paddocks set up, ready to go

- Covered, well-ventilated area that protects calves from rain and draughts
- No sharp edges, nails or tin
- No gaps in walls, floor or rails larger than a newborn's hoof
- No lead paint or newly tanalised wood within calf reach
- Clean fresh drinking water available
- Access to comfortable lying surface
- Bedding material supplies ordered
- Designated area for sick calves
- New teats for calfeterias, and all equipment cleaned and checked
- Assemble a well-stocked, easily accessible calving kit, and talk its contents through with staff.

Calving kits

Be prepared! When you are cold, wet and tired, stumbling in the dark at three o'clock in the morning searching for calving ropes is, at the very least, going to add to stress levels. With a bit of forward planning a well stocked, easily accessible calving kit will help reduce stress levels and improve calving performance.

Portable calving kit contents

- Metabolics – clearly labelled milk fever treatments, starter drench (colour code to avoid confusion)
- Three calving ropes (check the ropes are supple and strong. Ropes may have deteriorated since last use)
- Two litre container of lube (a plunger pump is easier to dispense lube, especially if busy holding a rope)
- Old towel and soap for cleaning hands before and after assisting calving
- Bucket (a lid is handy)
- Notebook and pencil (pens stop working in the wet) including planned calving dates (LIC form)
- Ear tags or other calf ID system (pre-numbered tags with corresponding numbers record sheet to reduce the chance of recording mistakes)
- Spray paint – red plus another colour (use red as warning colour e.g. withhold milk)
- Gloves – rectal and exam (better too big than too small. Large size will fit most people)
- Sustenance (energy bars are a quick pick-me-up, to avoid mistakes due to fatigue)
- Torch and spare batteries (use a head-torch to keep hands free).

- Iodine naval spray (pre-mix iodine/water, follow manufacturers' recommendations or buy pre-mixed iodine spray – do not dilute. **Do not use teat dip as a substitute**)
- Pocket size laminated intervention guides (calving/down cow).

The intervention guide on page 45 is a useful training tool to enable managers to clearly communicate the expected procedure for intervention at calving time. Use the diagram to run through various calving scenarios with the farm team. Highlight key expectations regarding time elapsed and calving progress made, along with the message to call for help if needed. Discuss the expected actions to be taken by staff for each scenario, according to their experience and ability.

Tip: Fill in the important contact numbers for your farm in the space provided then cut out the guide, laminate it and leave with the calving kit to help your team remember.

Remember that cows close to calving must be inspected at least twice every 24 hours.

TIP - Place the items in a water proof container and leave at the gate of the calving paddock. One kit per calving paddock. On the lid: key contact numbers and a checklist of contents and what has been used or needs replacing.

Communications: Ensure that cell phone/RT is charged, working and that credit is on cell phone. Vet and manager's number in contacts or on speed dial.

The Dairy Cattle Code of Welfare describes the minimum standard that must be achieved under the Animal Welfare Act 1999. It is available directly from the Ministry for Primary Industries.

Best practice calf rearing

To set a dairy cow up for a long, productive life you must give her the best possible start. Extra effort now will pay dividends throughout her milking life. Well grown heifers make more successful milking cows and growing them well starts from the day they are born.

Calves need to be fed high quality colostrum

- All calves, including bobby calves must receive adequate fresh colostrum within the first 12 hours of life and should be fed colostrum, or a colostrum substitute, for at least the first four days of life
- To get enough antibodies, calves should be fed a minimum of 4-6L of gold colostrum within the first 12 hours of life. Calves can only take about 1.5-2L in their abomasum, so multiple feeds within the first 12 hours is the target.
- High quality gold colostrum has a Brix greater than 22. Brix readers are affordable and very quick and easy to use.
- You can test to see if your calves are getting enough antibodies from colostrum by getting blood tests done by your vet.

Handle calves gently and with care at all times

- Always handle calves gently and with care. Do not allow anyone to throw, hit or drag a calf at any time
- Electric prodders must not be used on calves.

Calves should be provided with shelter

- All calves, including bobby calves must be protected from extremes of weather, especially wind, rain and cold at all times
- Calves must be provided with shelter. They should have access to a dry, clean, and sheltered enclosure as soon as practical after birth.
- Ensure enclosure minimises the risk of injury to either animal or human e.g. from slipping or striking sharp objects.
- Bedding areas must be comfortable, clean and dry, with adequate ventilation to ensure that ammonia gas does not build up.
- Exposed concrete, bare earth and mud are not acceptable.

Biosecurity plan for the calf shed

- Talk to your vet about creating a vaccination plan for your calves.
- The isolation or sick bay area should be well separated from other pens with separate access to reduce cross-contamination.
- Consider providing dedicated personal protective equipment (PPE) for the calf shed, to avoid transfer of bugs from the rest of the farm and eliminate the need to scrub gumboots.
- Check out dairynz.co.nz/biosecurity for more information about biosecurity around your calf sheds and creating a fortress for your replacements.
- Only allow essential people into the calf shed.

Calf shed recording systems

- Have a system to track individual calves that need extra checks, and sick calves being treated e.g. a whiteboard or blackboard
- Record all treatments.

Euthanasia policy

- Most farms have a few calves that are not viable. These must be euthanased humanely.
- Obtain advice if you are uncertain about this management area.
- DairyNZ guidelines for euthanasia methods are available as part of the humane destruction pack, available at dairynz.co.nz or phone 0800 4 DairyNZ (324 7969).

Calves need to be fed well to achieve weaning weights

- Feed calves well to rapidly achieve weaning weight with a well developed rumen.
- Calves should be fed at the same times each day to minimise stress.
- As well as milk, or milk replacer, have grain-based meal available for replacement calves as this helps speed the maturity of the rumen and allows earlier weaning. Provide good quality hay as well (not essential but it helps).
- Ensure meal feeders allow for all calves to access meal at the same time.

Calves should always have access to fresh water

- Ensure all calves have access to clean drinking water at all times.

Make regular health checks

- Calves must be checked twice daily for signs of ill-health and treatment given if any fall ill. Remove sick calves promptly to a sick bay
- Check that:
 - Noses are clear of discharges, and are moist and cool
 - Calves are alert and have responsive ears, with no infection around the ear tag
 - Navels are clear of infection – not pink/red, bleeding, hot, raw or swollen
 - Mouths are clear of ulcers
 - Eyes are bright and clear – not sunken
 - Calves have shiny coats
 - If a calf's pinched skin is slow to return to normal (longer than one second) it may be dehydrated and need electrolytes.

Ensure good routine hygiene practices

- Scrub all feeding equipment well with hot water and detergent daily
- Frequently clean and disinfect pens where sick calves are treated
- Calves of the same age should stay in the same pen. However, small or unthrifty calves may be better off with a younger group.

Disbudding

- Disbudding is best done at 2-3 weeks old, before the horn bud attaches to the bone of the skull. Local anaesthetic is required for disbudding at any age and for every disbudding method. Providing additional pain relief will reduce pain after the local has worn off and improve recovery after disbudding. Talk to your vet or contractor about your options.
- DairyNZ guidelines for disbudding are available at dairynz.co.nz or phone 0800 4 DairyNZ (0800 4 324 7969).

Wean calves at target weight

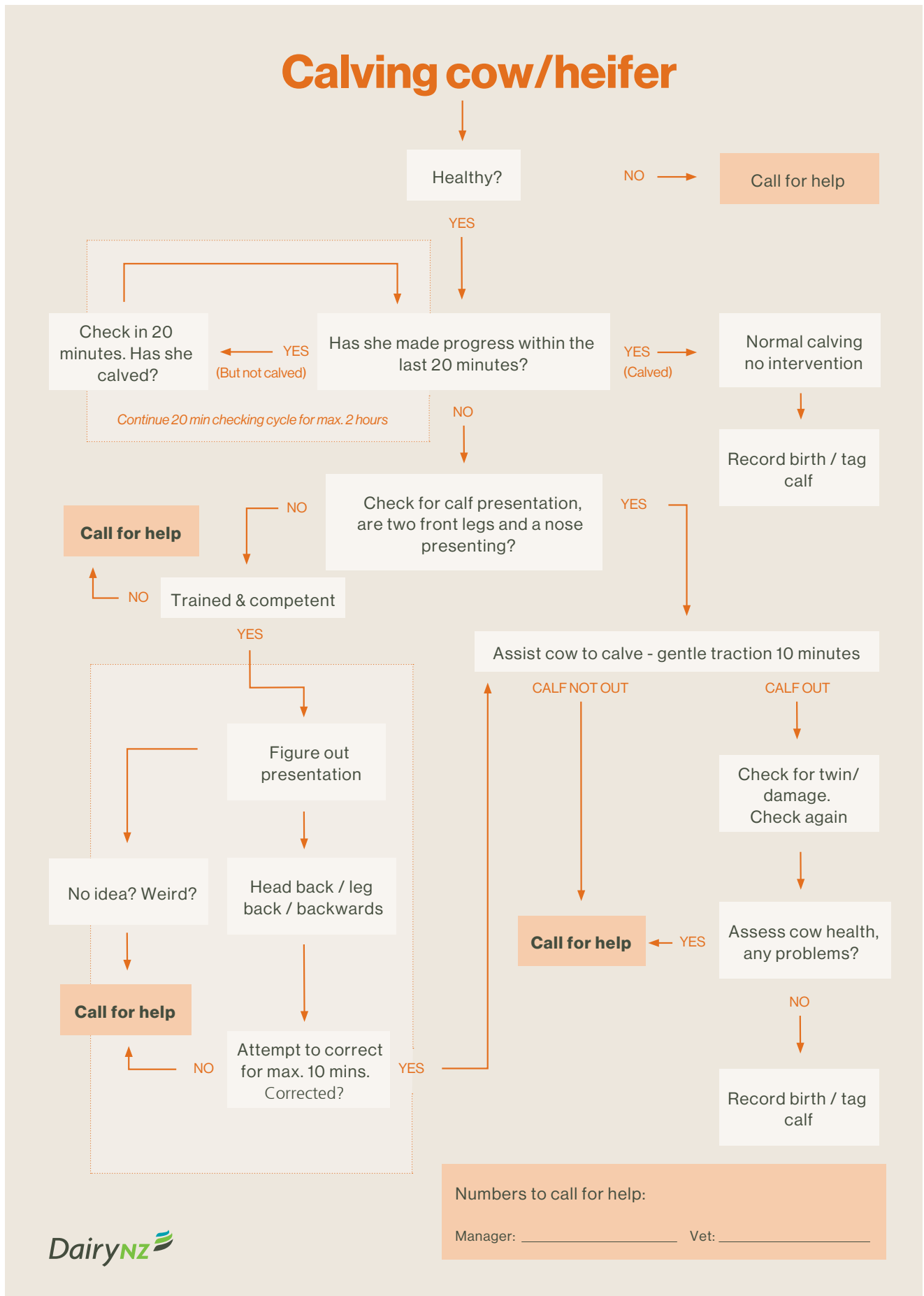
- Achieving a measured target weight is more effective than using age or guesswork
- Weaning weight will depend on the rearing system used and breed.

E.g. Friesian calves 100kg at around 6 weeks of age

Keep feeding meal after weaning to develop rumen to transition from milk to grass

- Once on pasture, provide them with up to 2 kg/head of meal daily. Gradually reduce this over the next few months
- Occasionally weaners will not thrive on the new feeding regime and will need continued access to meal.

Figure 8. Calving intervention guide



Bobby calf management

Bobby calf best practice guidelines are available from DairyNZ.

It is essential that everyone handling your stock, including your temporary workers and contractors, are aware of the requirements under the Animal Welfare Act 1999.

Here are some practical considerations for you to reinforce on your farm.

How do I know if my calves are fit for transport?

Calves must be a minimum of four days old before being presented for slaughter.

In addition to being a minimum of four days old (96hrs) before transport, the following signs will indicate if a calf is fit for transport:

- Healthy – No visible disease (e.g. scours), deformity, injury, blindness or disability. Eyes bright, not dull or shrunken. Ears are upright. No scours
- Strong – Able to bear weight on all four limbs. Able to rise from a lying position unassisted and move freely around the pen
- Hooves – Firm hooves on which the soles show wear (indicating that they have been mobile), not round and soft hooves
- Navel – Dry and withered, not pink/red, bleeding, hot, raw or swollen
- Fed – At least half the day's ration of colostrum (or colostrums substitute) is given not more than two hours before pick-up
- Ensure bobby calves are tagged with an appropriate ear tag.

Essentials for bobby calf collection pens

- Bobby calf pens should provide a dry and draught-free environment that is sheltered from prevailing winds
- If floor is slatted, make sure there are no under floor draughts (e.g. use a wind break material or timber to board up gaps)
- Make sure the pen is safe – no sharp edges, any gaps in flooring/walls/ramps are smaller than the size of a newborn's hoof
- Ensure temporary coverings/windbreaks (e.g. tarpaulins) are well secured
- Make sure calves have access to clean fresh drinking water, including while waiting for collection
- Bobby calves should be able to walk directly from the loading facility onto the truck. See dairynz.co.nz for more information.

Make it easy for the truck driver

- **Do not present calves which are not fit for transport.** Calves should be individually assessed for fitness to transport. Unfit animals must be withheld until fit, or humanely destroyed
- Where possible, assist the truck driver with loading the animals. Not only does this make the job easier, it enables you to ensure the animals are loaded correctly
- Make sure that there is easy access for the truck. A solid base with no overhanging objects is preferred, as this makes it quicker/easier to load the calves
- If holding calves in a large pen, provide a means of controlling animal movement, e.g. boards or a moveable gate, so that animals are easier to catch.

Other things for you to consider

- Any unfit calves must be euthanased humanely. The preferred options are a firearm shot with a .22 rifle or other suitable firearm, from a distance of 5-25 cm, or with a captive bolt device held firmly in contact with the head. The target for both methods is the intersection of two imaginary lines drawn from the eyes, to the base of the opposite horn bud
- Calling in a professional slaughterman is a good alternative option that you may wish to consider
- It is also common sense that practices that have the potential to cause upset i.e. humane destruction and storage of dead animals for collection, should be performed out of sight of the public
- DairyNZ guidelines for on-farm slaughter methods are available as part of the Humane Slaughter Information Pack, available at dairynz.co.nz or phone 0800 4 DairyNZ (0800 4 324 7969)

Managing cow health in spring

Metabolic disorders

Metabolic disorders around calving usually involve one of three different syndromes: Milk Fever, grass staggers/ grass tetany or ketosis. Commonly cows are affected by a combination of these.

Practical steps that can be taken to prevent these disorders are outlined below. Veterinary advice should be sought to tailor a prevention programme to your farm.

Milk fever

Milk fever is caused when calcium levels in the blood are too low for normal body function (especially nerve and muscle function). Cows get calcium from their diet and from their bones (called 'bone resorption').

Dry cows require very little calcium and their absorption mechanisms become "lazy". At calving, the demand for calcium increases quickly. If she cannot absorb calcium from her bones and diet quick enough, she will get milk fever. So to prevent milk fever, we can 'prime' the cows to reabsorb bone calcium and absorb dietary calcium more quickly. Actions to prevent milk fever:

- Supplement dry cows/springers daily with magnesium for at least 3-4 weeks pre-calving (quantities outlined below)
- Supplement colostrum and milking cows daily with magnesium
- Supplement colostrum cows daily with calcium. 150 g/cow/day ground limestone (lime flour) daily – double this rate if dusting
- Avoid grazing springer cows on paddocks where potassium fertilizer or lime have been applied within the last 3 months. Also avoid effluent paddocks
- Consider using starter/calcium/energy drenches on high risk cows at calving – 7+ year olds, or very fat, or with history of metabolic problems.

Ketosis

Ketosis is a lack of available glucose/energy, so the cow utilizes body fat by converting it to ketones as an alternative (but inferior) energy source. This generally occurs when well conditioned cows that are accustomed to being fed well are restricted.

Actions to help prevent ketosis (based on recent data from DairyNZ)

- Restricting springer cows to approximately 80% of their requirements for the two to four weeks pre-calving
- Making sure that colostrum cows are well fed.

Grass staggers or Grass Tetany (hypomagnesaemia)

Grass staggers occurs when magnesium levels in the blood are insufficient to meet demand. It can occur at any time of the year. Magnesium is not stored and so must be provided daily. Magnesium supplementation is important for both the prevention of grass staggers and milk fever and is outlined on the next page.

Magnesium – getting the right amount into your cows

Here are a few general tips – but always consult your vet or animal health advisor:

- Use blood tests to establish your herds magnesium level and effectiveness of supplementation programme.
- It's best to combine magnesium sulphate/choride through the water trough and magnesium dusted onto pasture or silage daily. You should not supplement with more than 60 g total of any of these forms of magnesium.
- When dusting ensure an even spread throughout the paddock.
- Check your equipment e.g. Dosatron, is calibrated accurately and working correctly.
- Some farms with very high potash levels in pasture will require high rates of magnesium supplementation.
- Where magnesium is added to water and the dosage is not accurate there is a risk of the water becoming toxic and stock refusing to drink.
- Have a clear on-farm procedure on supplementation programmes – including clear instructions on mixing minerals.
- Use Table 7 to calculate how much magnesium the cows require. Tables 8 and 9 show how much of each type of magnesium supplement is required. If you are still uncertain, consult your farm vet.



Table 7. Dietary magnesium concentrations and quantity of supplementary magnesium required (g/cow/day)

Mg requirement (% of diet)		Supplementary Mg (g/cow/day)		
		Jersey	J x F	Friesian
Dry	0.35%	12	16	20
Lactating	0.28%	15	17	20

Table 8. Quantities of magnesium sources to supply the required amounts of pure magnesium (down the throat)

Magnesium source (% Mg)	Example product	Magnesium required (g/cow/day)				
		12 g	14 g	16 g	18 g	20 g
Mg Oxide (55%)	CausMag	22	25	29	33	36
Mg Sulphate (10%)	Epsom salts	122	142	162	182	202
Mg Chloride (12%)	Mag chloride	100	117	134	151	167

If dusting CausMag on pasture, farmers need to at least double, possibly triple, the above to allow for field losses. When mixing with feed, double the rates above.

Table 9. Amount of CausMag dusted (g/cow/day)

CausMag		Rate of CausMag required (g/cow/day)				
		12 g	14 g	16 g	18 g	20 g
Mg Oxide (55%)	Double rate	44	50	60	66	72
	Triple rate	66	78	90	100	108

For example, a cow eating 20 kg DM/day requires 202 g of magnesium sulphate in the water. This is way above the recommended dose of 60 g magnesium sulphate per cow per day. In this situation, the cows need another supplement source and pastures could be dusted with 60 g CausMag/cow/day plus the 60 g of magnesium sulphate added to the Dosatron or trough.

Caring for down cows

When you consider the huge metabolic and hormonal changes that occur in cows around calving, often coinciding with testing weather conditions, it's not surprising that some of them 'go down'.

Arrange a 'spring first aid' training session with your veterinarian to discuss what to look for and discuss the most appropriate ways to handle down cows.

Diagnosis

The first step in deciding what to do is to establish a diagnosis, because not all down cows are due to metabolic disease, and not all metabolic disease is milk fever. Before reaching for the bag of calcium-boro-gluconate (CBG), always look for signs of:

- Calving paralysis
- Dislocated hip
- Sick or toxic cows due to mastitis, metritis (uterine infections) secondary to retained fetal membrane, diarrhoea or pneumonia
- Assess the cow's general demeanour – is she dull, depressed, almost comatose, (indicating possible milkfever) or agitated and behaving aggressively (less likely to be only milkfever)?

Basic tips on managing and caring for downer cows

Seek veterinary opinion if cow has not improved within 3-4 hours – do not simply keep treating with metabolic cocktails. Good nursing care that minimises secondary damage improves the chance of recovery by 7-8 times.

Treat early

- Treat promptly and specifically
- If milk fever, most cows should respond within one to two hours.

Give cows best chance of getting up

- Provide dry, soft bedding – move into shed
- Reduce risk of exposure – cow cover, move into shed.

Provide feed and water

- Provide fresh water at all times
- Encourage appetite by whatever means – provide high quality, highly palatable feeds
- Provide energy support (e.g. Monopropylene Glycol, Ketosis mix).

Move carefully

- Regularly (7 times per day) roll from side to side to improve blood flow
- If hip clamps are used they must be removed if the cow cannot promptly support her own weight and they should be padded
- If suspending a cow in a sling, she must be able to breathe freely, be reasonably comfortable, and be lowered from the sling if she cannot support her own weight after one hour
- Hip clamps must not be used to move cows. Use a transport tray, trailer or front end loader bucket
- If you are not able to provide good nursing care, or the cow is not improving, consider euthanasia.

Minimising the impact of early lactation mastitis

So you've had a milk quality review prior to dry off, culled the cows with bad udders or repeated cases of mastitis, invested in dry cow therapy and/or internal teat sealants, had the plant checked and look forward optimistically to a mastitis-free spring!

Here are some reminders of other ways to prevent, find and treat mastitis to include in your spring planning.

For more information, see your copy of Healthy Udder available at: dairynz.co.nz/mastitis

Prevent

Calve cows in a clean, dry environment

- Reduce exposure to environmental mastitis. Calve on clean pasture and avoid calving cows on stand-off areas. If calving pads are used, ensure they are scraped at least 2-3 times per week.

Keep teats in good condition

- Wash and dry teats thoroughly before the first milking to remove mud and help cows to let down milk. Set up systems to wash and dry dirty teats at every milking.
- Make up teat spray fresh at least 2-3 times a week at the HIGH mastitis risk rate, adding extra emollient, up to an additional 10%, to promote good teat skin condition.
- Monitor teat condition. If greater than 5% of cows do not have normal, healthy-looking teats consult your vet.
- Act on the recommendations from the latest milking machine test to avoid teat damage in the first few weeks after calving.

Prevent costly contamination of the bulk tank

- Check timing of the first few calvings in relation to dry off dates and withholding periods of dry cow treatment(s) used, especially if cows were milked on, into late autumn.
- Withhold colostrum for eight milkings from all animals to reduce risk of contamination by colostrum and dry cow antibiotics. Heifers can be withheld for an extra two milkings if the risk of bulk milk SCC grading is high.
- For herds milking once a day, discuss appropriate milk withholding periods for colostrum and antibiotics with your vet.
- Set up an agreed identification and treatment system for infected cows to avoid mishaps that result in costly inhibitory substance grades or dumping precious milk. Base it on MRS T (Mark, Record, Separate, Treat) and make sure everyone knows the system.

Find

- Look for new clinical cases and take action early.
- Find clinical mastitis cases soon after calving to increase the chance of cure. Every quarter should be stripped before each milking whilst cows are in the colostrum mob.
- Define clinical cases that will be treated – new research supports treating only those that show clinical signs for 3 squirts, ideally onto a black surface or strip cup.
- Screen colostrum cows at their 8th milking as to their suitability to enter the bulk tank (e.g. Rapid Mastitis Test, RMT). Retain positive cows in the colostrum mob and retest 1-2 days later.
- Ensure the use and interpretation system is standardised among all operators. Unless bulk milk SCC is at risk of grading, the need for RMT testing declines as the number of cows in milk builds above 100.
- Know your enemy – collect sterile milk samples from the first 10-20 clinical cases of the season, prior to treatment. These can be frozen and submitted for bacterial culture as a batch of samples when more information is required to identify the cause.

Treat

Treat appropriately

- NZ studies have established that >60% of mastitis over calving is due to *Streptococcus uberis*, and unless milk culture results indicate otherwise, penicillin or its derivatives represent the best therapeutic approach.
- Set up an animal treatment plan with your vet so that cows with clinical mastitis (i.e. visible signs) receive the most appropriate treatments. Some cases may benefit from longer treatments, with extended milk withholding periods as necessary. Discuss and develop a standard approach with your vet and farm team.
- Follow MRS T – Mark the cow, Record her details, Separate the cow from the milking herd, before Treating her for clinical mastitis.

The cost of lameness

The cost of lameness is considerable at an average of well over \$400 per case, not to mention the growing and well-founded concerns regarding animal welfare and the effect that lame cows have on staff morale.

Multiple risk factors contribute to lameness. It is the interaction of the cow, her environment and management that leads to lameness on farm and no single silver bullet will fix it. Instead, it requires commitment and sustained effort to reduce the incidence of lameness. For a fresh approach to solving lameness woes, enquire about DairyNZ's Healthy Hoof Programme. The programme offers a practical and systematic approach to reduce the incidence of lameness on your farm. For more information visit **dairynz.co.nz/lameness**.

Cows hooves are most vulnerable to damage in the 8 weeks after calving due to relaxation of ligaments in the hoof, so gentle handling at this time is critical to reducing lameness. While preventing lameness is the ultimate goal, it is also important to be able to rapidly identify, accurately record and appropriately treat those cows who do become lame.

Arrange a lameness training day to cover:

- Your farm policy and procedures on preventing lame cows. For example – cows allowed to walk to the dairy at their own pace – no heads up
- Early identification of lame cows
- Recording and reporting lame cows
- See DairyNZ's Healthy Hoof app (**dairynz.co.nz/lameness**)
- Who is responsible for treating lame cows? They may require treatment training
- Managing lame cows in a separate mob

During the dry period, check if any maintenance is required for laneways and yards, for example ensure rubber matting at exit bale is fastened down.

TIP - For help on detecting lame cows early – view the Healthy Hoof Lameness Scoring site at dairynz.co.nz/lameness. For more information on the DairyNZ Healthy Hoof programme and to find a trained provider near you, visit **dairynz.co.nz/healthyhoof**

Managing vulnerable cows

Cows which are thinner or have not gained as much condition as the rest of the herd require additional care through their dry period, calving and early lactation.

1. Separate and preferentially feed high quality pasture and/or supplement throughout the dry period.
2. Monitor body weight recovery. Animals that fail to recover appetite and/or reasonable body condition, and maintain an ill appearance or develop chronic scour, are not likely to survive or become productive again. These should be culled.
3. A health check by a veterinarian may be appropriate to rule out a disease process e.g. liver damage from facial eczema (which may have been subclinical), Johne's disease, etc.
4. Establish a separate springer mob and feed generously.
5. At calving, treat with:
 - Calcium-energy starter drench
 - Vitamin A, B12, D and E.
6. Be prepared to milk affected animals once a day and separate from the main herd.









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0800 4 DairyNZ (0800 4 324 7969)