

# 8

## Calf and heifer management

8

Heifers

41–56

<b>Assessing calf and heifer management</b>	<b>42</b>
<i>“I don’t see how a few light heifers will make a difference to herd fertility.”</i>	43
<i>“I’ve seen my neighbours out there weighing heifers. Surely they’ve got something better to do?”</i>	43
<i>“I thought we had to stick to the recommended age at first calving – how do we choose one for our own farm?”</i>	45
<i>“I’ve figured out my calving pattern for first calvers, but what does it tell me?”</i>	48
<i>“I’ve got all the herd test sheets in front of me. Now what do I do?”</i>	49
<b>Rearing calves from birth to weaning</b>	<b>50</b>
<i>“Isn’t it enough just to make sure the calf’s had a good drink soon after it’s born?”</i>	50
<b>Growing heifers from weaning to mating</b>	<b>52</b>
<i>“My heifers are way too light! How do I manage underweight heifers?”</i>	52
<b>Planning mating</b>	<b>54</b>
<i>“Why would you go to all that trouble AI’ing heifers?”</i>	54
<b>What to do during mating</b>	<b>55</b>
<b>What to do with pregnant heifers</b>	<b>55</b>

# Assessing calf and heifer management

The reproductive performance of replacement heifers is directly related to liveweight at mating and calving. Calves and heifers must be reared to achieve liveweight targets, otherwise their first calving will be delayed, their liveweight at calving will be too low and their fertility during their next mating period reduced. Well-grown heifers also produce more milk, compete better with mature cows and survive longer in the milking herd than poorly grown animals.

Calf and heifer management on many farms is a limiting factor to herd reproductive performance. The first step in making improvements is to assess the calves and heifers in your herd.

Measuring liveweights, setting liveweight targets, assessing the calving pattern for first calvers and comparing their milk production with that of mature cows are ways to do this (pages 43–49).

Doing a good job of rearing calves from birth to weaning (pages 50–51) and growing heifers from weaning to mating (pages 52–53) will help you achieve optimal pre-calving liveweight targets for your heifers.

**Achieving optimal liveweight targets by Mating Start Date ensures that maiden heifers in seasonal and split calving herds cycle early, conceive early and calve early.**

- > **Weigh your heifers every 3 months.**
- > **Take action to improve nutrition and ensure good parasite control if the average weight is below target.**



## Measuring liveweights

Weigh your heifers every 3 months, and more often if you want to be more accurate and able to make management changes more quickly. You can get away with using a weigh tape until the calves are 200 kg. After that, use scales because tapes can over-estimate the weight of the heavier heifers. Check that you are using the scales according to the manufacturer's instructions.

Weigh heifers at a similar time of day, preferably in the morning, or let them stand in the yard for 2 hours before each weighing to minimise the effect of changes in gut fill.

These tips may make your job easier:

- Walk through the heifer group regularly to get them used to people.
- Handle heifers quietly and do not force them through your set-up with items like poly pipe. Although it's sometimes difficult, be patient! It gets easier with practice.
- Use a bit of rubber matting or old carpet to cover the platform of the scales and reduce noise stress.
- It might be worth running the heifers through the dairy and yard when you bring them in for weighing, as this gets them used to the yard and shed.
- Portable cattle yards may be a worthwhile investment if cattle handling facilities are not suitable for weighing. Chat with the neighbours as these costs could be shared.



***I don't see how a few light heifers will make a difference to herd fertility.***

You can expect reduced reproductive performance when heifer liveweights are low for two reasons:

- 1) delayed first calving and
- 2) delayed interval from calving to the next conception.

When calf and heifer growth rates are low, by the time you start mating the heifers, liveweights are lower than you had aimed for. Low liveweight delays puberty, so these heifers are less likely to have started cycling at Mating Start Date. They often take longer to get in calf and will calve late. You may need to consider delaying mating if liveweights are too low.

In seasonal and split calving herds, late-calving heifers commonly become late-calving cows and reduce overall reproductive performance in the next mating period.

Six-week or 100-day in-calf rates in first lactation can be reduced by more than 15% in underweight heifers.

***Making sure heifers calve on time, and at the right size, takes planning.***



***I've seen my neighbours out there weighing heifers. Surely they've got something better to do?***

Weighing heifers gives you a good idea of how they are growing compared to your targets. You already know that the smaller first calvers seem to take longer to get in calf. They either end up sold or have a very long lactation because they didn't get in calf, on time, the following year. The InCalf Tools provide quick and easy methods for weighing heifers and assessing the results against targets.

***Make 3-monthly weighing a habit.***



## Setting liveweight targets in heifers

Setting liveweight targets for heifers is an individual farm decision. Determine the ideal liveweight for your heifers at calving by weighing some mature cows of the desired size just before calving. You should aim to have your heifers at 85% of this weight.

Once you have determined the preferred calving liveweight for your heifers, you can plan target liveweights for heifers at different ages.

- Set individual farm targets for heifer liveweight from weaning through to calving.
- Weigh and measure heifers at least every 3 months.



*If the average liveweight of heifers is below the target, take action to increase growth rates (page 52).*



For first cross animals, set target liveweights about three-quarters of the way from Jersey to Holstein-Friesian targets.

**Seasonal/split calving herds, go to page 47**

**Don't get caught with underweight heifers. They are far less likely to have a long, productive life in the herd.**



### Setting liveweight targets in heifers

After identifying target weights, year-round calving herds must also select a target age at first calving (see below).

On the next page are tables that can be used to determine heifer liveweight targets for varying mature cow weights just before calving. Modify these tables to suit your herd based on the liveweight of your mature cows at calving and the preferred age at first calving.

- These tables assume reasonably constant growth rates from weaning to calving. If it is not possible to maintain high growth rates from mating to calving, set higher target weights to mating.
- Even where target age at first calving is long (e.g. over 30 months), ensure targets are at least 230 kg (Holstein-Friesian) and 185 kg (Jersey) at 12 months of age.
- Where target age at first calving is more than 30 months, lower growth rates are acceptable. However, avoid low growth rates between weaning and 12–15 months to ensure proper skeletal development and hence frame size.



***I thought we had to stick to the recommended age at first calving – how do we choose one for our own farm?***

Ask yourself a couple of questions:

1. Do you want to increase herd size through self-replacement? If you require a rapid increase in herd size and breed replacement stock rather than buy cattle, a younger age at first calving is helpful.
2. Can you provide good quality feeds for calves and heifers? If you decrease the age at first calving, you will need to provide good quality feeds (better than 10 MJ ME/kg of dry matter) to ensure acceptable heifer growth rates. Do not calve heifers at younger ages unless target liveweights can be met.
3. Also check:
  - how much of the farm area with good quality pasture is available for rearing heifers;
  - the availability, cost and pasture quality of agisted land;
  - the cost of feed supplements necessary to achieve desired weight gains; and
  - the ability to regularly provide supplementary feeds to heifers.

Generally, where good-quality pasture and low-cost supplements are available, set your target for first calving at 24 months. If they are not available at a reasonable cost it may be better to calve heifers at older ages. However it is unlikely to be economic to first calve heifers at more than 36 months or less than 24 months of age.

An alternate solution to achieve target liveweights could be to contract-rear heifers off-farm if farm feed supplies are insufficient, or to purchase well grown heifers.

***The choice is yours but a good cost benefit assessment is needed to help make the decision about when to calve heifers.***



### Setting liveweight targets in heifers

**Holstein-Friesians: Target heifer liveweights for high reproductive performance based on a mature cow liveweight just before calving of 550, 600 and 650 kg, and first calving at 27 months.**

When	Liveweight for typical heifers (kg)			
	Mature cow liveweight	550 kg	600 kg	650 kg
3 months (fully weaned)		100	100	100
7 months		151	157	162
11 months		204	216	228
14 months		256	274	292
18 months (mating)		307	331	355
21 months		358	387	417
24 months		413	449	485
27 months (pre-calving)		468	510	553

**Jerseys: Target heifer liveweights for high reproductive performance based on a mature cow liveweight just before calving of 400, 440 and 480 kg, and first calving at 27 months.**

When	Liveweight for typical heifers (kg)			
	Mature cow liveweight	400 kg	440 kg	480 kg
3 months (fully weaned)		75	75	75
7 months		112	116	121
11 months		150	160	169
14 months		188	202	217
18 months (mating)		224	243	263
21 months		261	285	308
24 months		300	329	358
27 months (pre-calving)		340	374	408

Continue reading, page 49

**T**

The InCalf Heifer Tool provides an easy-to-use process for weighing heifers, identifying the gap between current and target liveweights, and assessing potential benefits from improved heifer management.

### Setting liveweight targets in heifers

Example targets are shown below. Modify these tables to suit your herd based on the liveweight of your mature cows at calving.

These tables assume reasonably constant growth rates from weaning to calving. If it is not possible to maintain high growth rates from mating to calving, you will need to set higher target weights to achieve before mating.

The struggle to achieve liveweights by Mating Start Date is more difficult for late-born heifers. These heifers will not be 15 months of age at Mating Start Date. You may need to preferentially feed late-born heifers to achieve the targets.

#### Holstein-Friesians: Target heifer liveweights for high reproductive performance based on a mature cow liveweight just before calving of 550, 600 and 650 kg, and first calving at 24 months.

When	Liveweight for typical heifers (kg)			
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The InCalf Fertility Focus report calculates the calving pattern of first calvers.



**I've figured out my calving pattern for first calvers but what does it tell me?**

Imagine you started mating your herd on 23 October. That gives you a planned start to calving next season of 1 August. If your Mating Start Date for heifers was also 23 October, you should expect at least 51% of the first calvers to have calved by week 3 of the herd's calving pattern (21 August). If you had fewer calved by this time, you should check your calf and heifer management, bull management, and, if used, heat detection and the AI technique.

If your Mating Start Date for heifers was 9 October, 2 weeks earlier than for the herd, you should expect at least 78% of the first calvers to have calved by week 3 of the herd's calving pattern (21 August). The table below can help you determine what to expect.



**Seasonal/split calving herds**

**Assessing the calving pattern of first calvers**

The calving pattern of first calvers is an indicator of how successful your calf and heifer management has been. The calving pattern can be less reliable as an indicator if you have fewer than 30 first calvers.

Review the calving pattern of first calvers:



Top farmers have 73% of their first calf heifers calved by week 3 and 92% by week 6 of calving in the herd.



If less than 51% of first calf heifers calved by week 3 and less than 85% of first calf heifers calved by week 6 of calving in the herd, review:

- calf and heifer management;
- bull management; and
- AI technique and heat detection if AI was used.

Expect higher results if the Mating Start Date for heifers was earlier than for the milking herd.

If the mating period for your heifers started *before* the cows, you can use the table at the bottom of this page to determine how well your heifers calved. If the Mating Start Date for heifers was *later* than for the milking herd, it may be difficult to achieve a high percentage of first calvers calved by week 3 of calving in the herd. If you had to delay Mating Start Date because yearlings were poorly grown, review calf and heifer rearing. If Mating Start Date was delayed because of management convenience, plan to implement an earlier Mating Start Date for heifers.

The Mating Start Date for heifers should be the same or earlier than the main herd in all seasonal and split calving herds to ensure heifers conceive early in the mating period that follows their first lactation.

Mating heifers earlier helps get them calved early and gives more time to recover before the next mating begins.

	% of heifers calved by week 3 of calving in the herd		% of heifers calved by week 6 of calving in the herd	
	Seek help	Top farmers achieve about	Seek help	Top farmers achieve about
Mating start date for heifers last year.				
Same as cows	Less than 51%	73%	Less than 85%	92%
1 week earlier than cows	Less than 69%	81%	Less than 89%	96%
2 weeks earlier than cows	Less than 78%	87%	Less than 93%	98%
3 weeks earlier than cows	Less than 85%	92%	Less than 94%	99%

## Comparing the milk production of first calvers with mature cows

The milk production of first calvers can be compared to that of mature cows (those 4 years and older) to indicate possible weaknesses in the calf and heifer rearing program. This assessment requires data collected from herd recording.



Top farmers achieve milk production in first calvers of at least 83% of the milk production of the mature cows.



If your figure is less than 77%, review calf and heifer management practices as this may indicate the heifers were underweight at calving (page 52).



The InCalf Fertility Focus report automatically calculates the ratio of first calver milk production compared with mature cows (average litres/day). This is the easiest way to make this comparison. Alternatively, you can use your herd recording reports to compare 305-day yields.



***I've got all the herd test sheets in front of me. Now what do I do?***

My herd test sheet tells me that the average milk production of the first calvers is 4,900 litres. Now, I've made sure that this is the 305-day milk yield. Those little girls did pretty well that year!

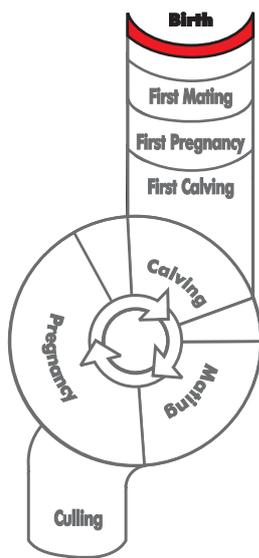
The cows that were more than 4 years old averaged 6,400 litres/cow.

$$\text{So } \frac{4,900 \times 100}{6,400} = 77\%$$

Boy, those top farmers can get their heifers to do 83% of their mature cow production. Looks like I've got a bit of work to do on my heifer rearing!

***Save yourself a calculation job – get an InCalf Fertility Focus report that works this out for you!***





## Rearing calves from birth to weaning

From the day a heifer calf is born, you start the process of maximising her potential to get in calf. You need to rear healthy calves, provide them with good nutrition and adequate housing, and run an accurate identification and record keeping system.

In regions where Johne's disease (JD) is common, the calf-rearing system should reduce the risk of transmission. The risk of transmission increases with long periods of suckling. Remove calves from their mothers within the first 24 hours of life or within 12 hours in areas where JD is common. To reduce the chance of infection with JD, graze heifers on areas of the farm reserved solely for young stock. Do not graze heifers on areas irrigated or contaminated with effluent. The same holds true when agisting heifers.

Identify calves as soon as possible after birth using a permanent National Livestock Identification Scheme (NLIS) ear tag or other tags as required. Recording the IDs of both the calf and its mother is good practice.

A healthy environment is essential to rearing healthy calves. Housing should be clean, dry, well ventilated and draught free. If bedding is provided, use non-edible types such as sawdust or rice hulls. Group calves together according to age and size with no more than 10 calves per group. It is not a good idea to mix batches of calves. Sick calves should be isolated so that infectious diseases are not transferred to healthy calves.



### ***Isn't it enough just to make sure the calf's had a good drink soon after it's born?***

The calf has to get a drink, but it's got to be enough of the right stuff – colostrum. It is critical that newborn calves consume 1–2 litres of good-quality colostrum during the first 6 hours of life. During the first 24 hours of life, Holstein-Friesian calves need a total of 4–5 litres, while Jersey calves need 2–3 litres.

If you have any doubt that calves have received this colostrum by suckling the dam, you should give them 1–2 litres of colostrum using a bottle or stomach tube. For this initial feed, only use colostrum from the first milking after calving. Don't use colostrum from induced cows. Good quality colostrum can be stored in a refrigerator for up to 7 days or frozen in 1–2 litre containers for later use.

Colostrum quality is variable between cows and is most likely to be high in lower-producing, non-induced, older cows. You can buy a colostrometer to test colostrum quality.

Avoid using colostrum from cows possibly infected with Johne's disease (JD) or Enzootic Bovine Leucosis (EBL).

***It's taken a lot of work to get that calf on the ground.  
You don't want to lose it for lack of a few litres of good colostrum.***

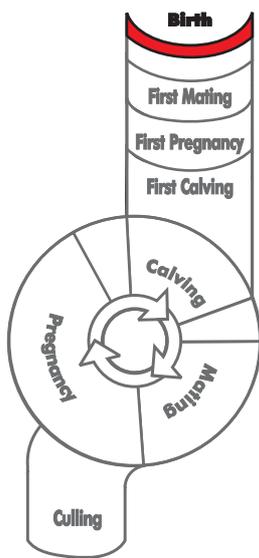


There are many successful ways to rear calves, including early weaning, restricted milk systems and *ad lib* milk systems. In general, feed milk, colostrum or milk replacer until calves are at least 5 weeks old. For all systems, make any change to the quantity or type of milk fed gradually, and be consistent with time of feeding, milk temperature and milk concentration.

- Remove the calf from its mother soon after birth and ensure it receives adequate, good-quality colostrum (see bottom of page 50). Identify and record birth and dam details.
- Dip or spray calf navels with a strong (2%) iodine solution immediately after birth, especially if wet conditions exist.
- Check that fresh water, clean straw and high-quality concentrates (at least 12 MJ ME/kg DM and 18% crude protein) are available at all times.
- Separate sick calves and feed them last. Don't forget to wash your hands, boots and feeding equipment after handling them.
- Vaccinate against clostridial diseases and leptospirosis according to the manufacturer's instructions. Calves generally require two or three vaccinations in their first year of life and annual boosters thereafter.
- Check that all calves are drinking milk and eating pellets on a daily basis.
- Thoroughly clean and disinfect calf sheds between seasons. Consult your adviser to find out about appropriate disinfectants.
- Do not re-use pens that have housed sick calves unless bedding is replaced and the pens have been thoroughly disinfected.



**"With 400 cows to calve, this is the only way I can be sure each calf gets its first feed of colostrum. It's easy to pass a stomach tube and I get the colostrum into the calf quickly."**



## Growing heifers from weaning to mating

Good calf management must be followed by a focus on heifers in the time from weaning to their first calving. This will provide the best opportunity for heifers to calve on time in the first and subsequent years.

Selecting the right time to wean calves is a two-part decision: they must have reached their target weight and be eating at least 0.75 kg of concentrates each day. Holstein-Friesian calves should be weaned between 90 to 110 kg; Jersey heifers can be weaned between 65 and 85 kg. Dehorning calves well before weaning will avoid any setback in growth that may occur.

The key to feeding heifers is to ensure they economically achieve targeted weights (page 46) with good frame development. Remember that the first 12 months are the most critical for skeletal and muscle development. In many cases, supplements will be required as young heifers are unable to achieve high growth rates on a diet of average pasture and/or hay alone. Older heifers will also require supplementary feed at strategic times when pasture is unable to fulfil their requirements for energy and protein (e.g. the summer–autumn period in many districts throughout Australia).

Differentially feeding groups of heifers according to their size and weight can help to ensure that smaller, lighter heifers reach their target liveweight for mating. During mating, avoid sudden reductions in feed. The reproductive performance of heifers can be reduced substantially if feed is reduced during mating.

### **My heifers are way too light! How do I manage underweight heifers?**

Heifers with below target liveweights are often the result of too little pasture or from offering pasture that was mature, dry or contained tropical grasses.

When pasture is inadequate or of poor quality, you should consider adding supplements to the diet. There are many supplements that can be added to provide energy alone, or a combination of energy and protein. You should discuss the options with an adviser.

As an alternative source of pasture, you can also investigate agistment options.

Don't forget to control parasites that can also reduce heifer growth rates. Review your current routine with your vet.

**Don't get caught with light heifers.**

- Feed good quality concentrates (at least 11.5 MJ ME/kg DM and 16% crude protein) until calves reach 200 kg, unless they are fed abundant, high-quality pasture. Remember that protein content and quality is important to ensure good skeletal and muscle development.
- Develop worm, tick, lice and buffalo fly control programs in consultation with your vet. Vaccinate for tick fever between 4 and 10 months if appropriate for your region.
- Don't forget the clostridial/leptospirosis booster vaccination at 12 months of age.
- Monitor liveweights at least every 3 months. If results are below targets (pages 46-47), consider supplementary feeding to increase heifer growth rates and review your parasite control program (page 52).
- Keep heifers away from areas grazed by mature cattle, irrigated or contaminated with effluent to prevent infection with Johne's disease.
- Consider the need to supplement heifers with trace elements, vitamins and other feed additives with advice from an adviser.
- Keep heifers away from poisonous plants, including lantana and bracken fern.

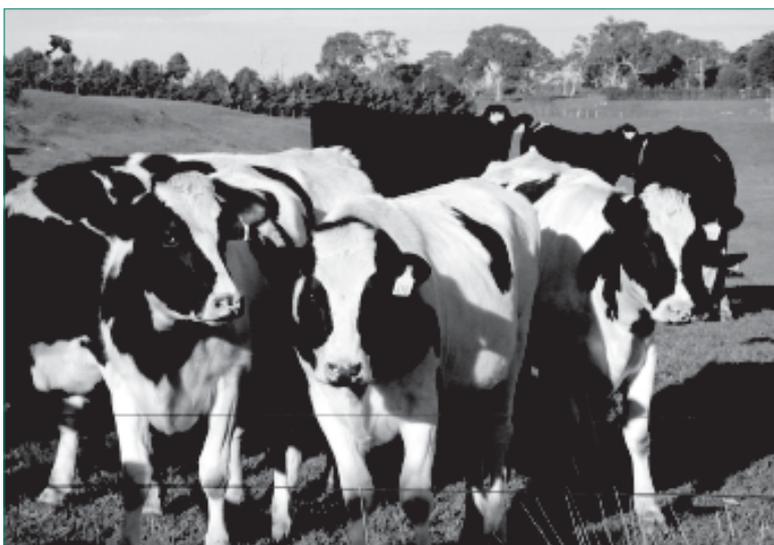


Every time you vaccinate or drench your heifers, check if they are due to be weighed – it may be convenient to do both jobs at once.

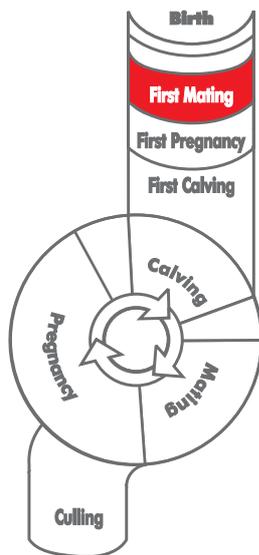
**Year-round calving herds, go to page 54**

#### Seasonal/split calving herds

For good reproductive performance, late-born heifers must achieve the same liveweights as the earlier-born heifers by Mating Start Date. To achieve this, they must grow more quickly than earlier-born heifers. Consider preferentially feeding late-born heifers to achieve the same liveweights as their older counterparts.



**These heifers are in good condition, but you won't know if they are up to target weights until you weigh them. Looks can be deceiving.**



## Planning mating

Planning ahead will make for a more successful heifer mating period.

- Decide when to mate heifers.
  - In year-round calving herds, this will be determined by the target age at first calving (page 45).
  - In seasonal/split calving herds, think about mating heifers to start calving 2 weeks earlier than the milking herd to ensure good reproductive performance at their next mating. You will need your heifers at the required target mating weight (page 46) 2 weeks earlier if you want to do this.
- Use AI sires with low calving ease scores (no more than 3) or a breed of bull known to be easy calving (page 117). An option to minimise calving difficulties and produce extra replacements is using Jersey AI sires on Holstein-Friesian heifers and rear the crossbred replacements.
- Decide if you are going to AI the heifers. If you decide to use Holstein-Friesian semen on heifers, select sires with a Calving Ease ABV of no more than 3, with a reliability of at least 60%. The lower the Calving Ease ABV, the better! This will reduce, but not eliminate, the calving difficulties you are likely to experience.
- If you are going to AI heifers, check what needs to be done (page 96).
  - Have you considered using a professional AI technician, as heifers can be more difficult to inseminate than cows?
  - Have you allowed for the extra time and skilled people required to implement an AI heifer program?
- Will you heat synchronise heifers to allow planned use of people's time (page 93)?
- What bulls will you need (page 122)?
- If heifers are to begin calving before the cows, you will need to plan the labour and skills required to manage them during the calving period and when being introduced to the milking routine.



### Why would you go to all that trouble AI'ing heifers?

There are several reasons to AI your heifers. It allows you to rear extra AI replacements to increase herd size more rapidly. In seasonal herds, you can also get the same number of AI replacements with a shorter AI period in the milking herd. As a bonus, you can increase the rate of genetic gain of your herd by using this strategy. Don't take AI'ing heifers on without serious consideration. Mating heifers to Holstein-Friesian AI sires can result in serious calving difficulties that can often negate the benefits. You should discuss this option with your vet, semen supplier and other farmers before taking it on.



## What to do during mating

The focus during the mating period is on maintaining growth and implementing a successful mating program.

- Monitor liveweights at least every 3 months. If results are less than targets, consider supplementary feeding to increase heifer growth rates and review your parasite control program (page 52).
- Monitor bull serving behaviour throughout mating to ensure heifers are being mated successfully.
- Ensure sufficient bulls are used (page 122).

## What to do with pregnant heifers

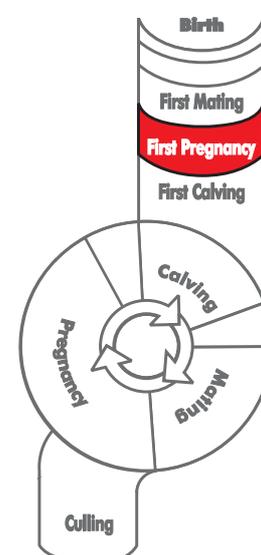
Once heifers are in calf, they still need to grow right up until calving at a rate sufficient to achieve targets.

The period between mating and calving is a good opportunity to assess the reproductive performance of the heifers. Early pregnancy testing (less than 15 weeks after mating began) allows you to identify which heifers conceived early in the mating period as well as predicting calving dates. Knowing when heifers are expected to calve can help in the management at calving. Pregnancy testing 6–8 weeks after the end of mating only identifies non-pregnant and later calving heifers.

- Monitor liveweights at least every 3 months. If results are less than targets, consider supplementary feeding to increase heifer growth rates and review your parasite control program (page 52).
- Identify non-pregnant heifers and consider culling them.

If you are pregnancy testing heifers in a seasonal/split calving herd, assess their predicted calving pattern (page 48).

Heifers are still themselves growing when they calve for the first time. Even though they are smaller, they should receive at least the same quantity of feed as mature dry cows. If heifers have not reached their target weight when close to calving, consider running them separately from springing cows and feeding them preferentially.



Year-round calving herds should run at least one bull with pregnant heifers at all times in case any abort. This will help ensure they quickly become pregnant again.

Now I get it. If I don't start early, they'll never be big enough.  
(Page 42)

incalf

I didn't realise that well-grown heifers should produce 83% of the milk from mature cows.  
(Page 49)

incalf

Weighing heifers is pretty important, I guess I should get a set of scales.  
(Page 43)

incalf

Boy, it takes a lot of feed to get those skinny heifers back in shape.  
(Page 52)

incalf

I thought those heifers were going all right until I saw that liveweight target table.  
(Page 46)

incalf

I'd better talk to someone to sort out this AI stuff.  
(Page 54)

incalf

Get ready! We need two-thirds of those heifers calving down in the first 3 weeks.  
(Page 48)

incalf

Those bulls had better be working!  
(Pages 55 and 122)

incalf

Those poorer heifers are going to end up late getting in calf.  
(Page 48)

incalf

They've got to grow a calf and themselves – it's a big ask for the young girls.  
(Page 55)

incalf