



# JOINING PERIODS

REPRO active

# WHY ARE JOINING PERIODS IMPORTANT TO YOU?

This tech note explores optimising calving performance by reducing the duration of mating to as little as 6 weeks. Having shorter joining periods reduces the spread of calving and may:

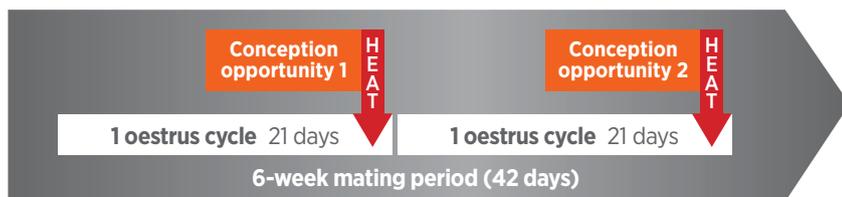
- give cows a longer period to recover and maintain a 12-month cycle
- identify superior calves at weaning to easily recognise which heifers to retain
- tighten the herd's age structure to separate growth rate from age

**The duration of joining is dependent on your system. To find out whether shorter joining periods is right for your herd, seek further advice from your veterinarian or an experienced advisor.**

## What is an ideal joining period?

Many important factors drive fertility in beef herds including herd management, female nutrition, bull management, vaccination against preventable reproductive diseases, parasite control and genetics. Whilst the normal industry recommendation is to join for up to 9 weeks there are a number of important advantages in running a herd with a 6-week joining period, especially in maiden heifers that are mated to calve at 2 years of age.<sup>1,2</sup>

**Females should display heat twice during the 6-week mating period. Those that do not conceive in the first two cycles should be removed from the herd.<sup>2</sup>**



### Conception rates

Consider how conception rates can affect you using the table below summarising the expected number of cows that should become pregnant in 2 cycles with different conception rates per 21-day cycle.

Together with adequate nutrition and mated cows at or above condition/fat score 2.5–3.0, a 65% conception rate per cycle should yield 88% of cows becoming pregnant in 2 breeding cycles.

Table 1 Expected number of pregnant cows (per 100 animals) with different conception rates.

Conception rate per 21 day cycle	Cows pregnant in first cycle	Cows pregnant in second cycle	Total cows pregnant in 42 days
60%	60	24	84
65%	65	23	88
70%	70	21	91

## RECOMMENDED JOINING PERIOD

The standard recommended joining period in which time, 95% of females mated should be pregnant<sup>2</sup>

**Heifers:** 6 weeks

**Remainder of the beef herd:** 9 weeks

## TIP

Optimal joining periods may take several years to achieve.

When nutrition permits, aim to reduce joining periods by -1-2 weeks/year, particularly in heifers.<sup>3</sup>

## TIP

Under reasonable nutritional conditions, approximately 90% of your cows should be pregnant in 2 breeding cycles (assuming 65–70% conception rates).<sup>4</sup>

## MAXIMISING CONCEPTION RATES

Manage the herd to maximise conception rates by

- prioritising nutritional feed to younger cows (first and second calvers)
- ensuring enough females are mated to guarantee that there will be enough replacement females in the herd.<sup>2</sup>

# WHY IS A SHORT JOINING PERIOD IMPORTANT?

## Why is a short joining period important in a profitable beef herd?<sup>2,4</sup>

There are many important reasons why herd managers should aim to join their beef herd for a short period.

- There is less age spread of progeny from a shorter joining vs a longer joining.  
This will produce a more even line of animals for sale. Consider the average age and weight of calves from herds with different joining periods (assuming weight gain of calves, time of calving and pasture available are similar in all herds).
- With a short calving spread, heifers and cows have more recovery time post-calving before the next mating period. This is particularly important for heifers at their second joining period where their post-calving anoestrus interval is longer.
- Weaners reared from a herd with a 6-week joining period will be older and heavier at any given date.  
This could have significant ramifications for both the steer and heifer portion of the drop, increasing:
  - average selling price
  - ability to reach ideal joining weight
- Progeny from a shorter joining (whether steers or heifers), at any point in time, will be heavier and thus be worth more at sale than progeny from a herd with an extended joining period.
- Both weight and age are important determinants of conception rate of heifer joining.  
At the start of joining, heifers reared from a herd with a 6-week joining period will be at least 10 kg heavier than a herd with a 12-week joining period; and additionally they will also be at least 10 days older.

## CONSIDER

Fertility rate may be reduced by 10% by delaying calving periods by 30 days, that is **1 in every 10 cows** of your herd.<sup>5</sup>

## TIP

Achieving short joining periods may not turn into increased profits. Determine pregnant females by preg-testing early (6 weeks after joining).<sup>6</sup>



Table 2 Difference in value of progeny in herds with different calving periods.

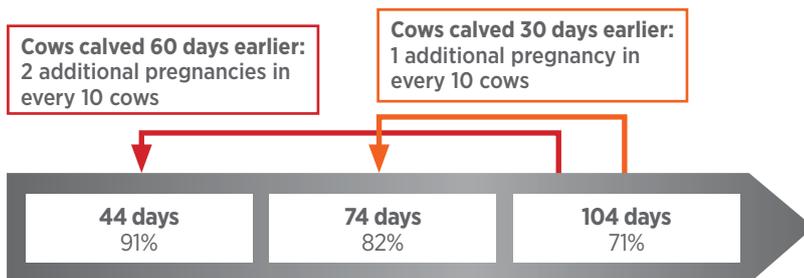
Cycle	% of herd calving in each cycle				Pregnancy rate (All empty cows culled)	Average weight lighter than 6 week joining (kg)	Average value lost (\$/head)* vs. 6-week mating
	1	2	3	4			
6-week mating CR 70%	77%	23%			91%		
9-week mating CR 65%	68%	24%	8%		96%	4	-\$8
12-week mating CR 60%	61%	25%	10%	4%	98%	7	-\$14
12-week mating CR 50%	54%	27%	13%	6%	93%	10	-\$20

CR, conception rate; \*Liveweight price \$2.00/kg

# WHY IS A SHORT JOINING PERIOD IMPORTANT?

- Herds with extended joining periods will have lower conception rates at the start of the next joining as they will not have enough time to recover after calving before bulls are introduced at the next joining period.<sup>7</sup>

Trial results suggest that the earlier a cow calves, the higher their subsequent fertility.<sup>5</sup>



The results show cows that calved early had ample time to recover post-calving, before the next joining period, whereas many late calving cows did not. The time taken post-calving to start cycling is also dependent on the level of nutrition, which is discussed in strategies to achieve a short joining period below.

An extended calving spread may be due to the calving pattern from the previous year. Simply look at the calves on the cows, and if there is a large range in their ages and size, then expect to get a drawn out calving pattern next season.<sup>8</sup>

- Labour requirements are substantially reduced in herds with shorter joining periods.<sup>5</sup>

As an example, the difference in supervision time between a 6-week and a 12-week calving period for a 200-cow herd could be at least 3 hours a day, if valued at \$30 per hour could be about \$3,780.<sup>4</sup>

## CALF SCOURS

The risk of neonatal calf scours is greater in herds with extended joining periods. To minimise the risk of neonatal calf scours, reduce calving spread so the potential build-up of harmful pathogens is reduced.<sup>8</sup> If you experience issues relating with calf scours talk to your veterinarian about pre-calving vaccination programs.



# ACHIEVING SHORT JOINING PERIODS?

The key strategies to running a successful short joining and calving period in a beef herd is efficient and insightful management. A short joining period is just one part of the management system that must be implemented to maximise pasture utilisation and profit of a beef herd. Within any breeding herd the management system and enterprise type (whether selling vealers, store weaners, feeder steers etc.) will be determined by the time of calving. This depends on local climate and pasture growth.

To optimise pasture utilisation and maximise profit, the most profitable systems fit the time of calving with the pasture growth curve to minimise the requirement for supplementary feeding and optimise the number of stock run and beef produced. If the time of calving does not fit with the pasture growth curve, the system is exposed to more climate and production risks, leading to poor nutrition of the breeding herd.<sup>7</sup>

## Nutrition

Nutrition is critical when managing a short joining period. It is a key determinant of heifer and cow cycling activity. The importance of nutrition, both condition score at calving and nutrition post-calving in determining subsequent pregnancy rates is highlighted in the table below.<sup>7</sup>

**Table 3 Effect of nutrition post-calving and condition score of cows at calving on cow reproductive performance<sup>7</sup>**

	Feed availability*	Condition score at calving		
		1.5-2.0	2.5-3.0	3.5-4.0
Days to return to first cycle post calving	high feed	49	38	31
	low feed	65	45	38
Pregnancy rate	high feed	84	92	90
	low feed	70	87	86

\*Dependent on available feed on the farm;

When cows calve in condition score less than 2.5, and particularly, on a poor plane of nutrition, the time required or the interval for cows to start cycling increases. This has important implications for managing tight calving periods. Recent findings from the maternal productivity project run by the Beef CRC shows a clear relationship between rib fat estimated breeding values (EBVs) and conception rates. At the same weight, pregnancy rate of those young females with high fat lines vs those with low fat lines increased by:<sup>9</sup>

- 8.5% in a 9-week joining period
- 12.3% in a 6-week joining period

## NUTRITION IS IMPORTANT

Heifers and cows with good nutrition will cycle early. This gives them a good chance of conceiving early to shorten calving patterns, increasing enterprise profitability.<sup>5</sup>



## TIP

Refer to the Condition scoring Tech Note for more information.

# HOW DO YOU ACHIEVE A SHORT JOINING PERIOD?

## Bulls

### Ensure only high fertility bulls are used during joining

Bulls should undergo a breeding soundness examination prior to joining to ensure only physically sound and highly fertile bulls are used.<sup>10</sup> Using sub-fertile bulls will result in lower conception rates which is a real risk in herds joining for short periods.

Apart from breed differences with herd fertility, there are also important differences with breed genetics that should be considered with your herd's breeding programs. There are number of important traits that can be selected for using genetic selection tools such as parentage, HD50K or Breedplan to manipulate herd fertility. For example, selection for reducing days to calving EBVs will improve herd fertility. A bull with lower days to calving EBVs will produce daughters that conceive earlier in the joining period. Heifers tend to reach puberty earlier and return to oestrus earlier after calving.<sup>11</sup>

### Scrotal size<sup>12</sup>

Scrotal size EBVs are also associated with high semen output and also influence female fertility. In the subsequent progeny, those from a higher scrotal size are associated with: earlier puberty, earlier return to oestrus and shorter days to calving.

Check the scrotal size of the bull is above industry standards. In British bred bulls, >32 cm (bulls aged 18 months) and >34 cm (bulls aged 24 months).

### First calf heifers<sup>13</sup>

First calf heifers require special attention as their return to oestrus interval is often longer than cows. The prevalence of anoestrus will depend on the nutritional status of the herd and the proportion of first calf heifers that calved less than 6 weeks at the start of joining. Use the following table as a guide to determine the effect of the interval for heifers and cows to return to first cycle post calving.

Days after calving	40	50	60	70	80	90
Heifers returning to oestrus (%)	15	24	47	62	68	79
Cows returning to oestrus (%)	30	53	72	82	89	94

In herds with nutritional challenges at joining

- Consider joining maiden heifers 3 weeks earlier (vs main herd) to allow more post-calving recovery time
- Prioritise pasture to heifers (first and second calvers) to ensure they start cycling as soon as possible after calving
- Maintain a tight calving pattern as late calving heifers are more likely to fail to conceive at the next joining period

## HOW TO START

**Altering the period of joining is not something that can be changed in one year, there are several key components that can help you start to achieve a short joining period.<sup>2,6,7,10</sup>**

- At calving, ensure females have
  - condition score >2.5-3.0
  - adequate feed over the calving period so the post-calving anoestrus interval is short
- Only highly fertile bulls that have undergone a breeding soundness evaluation should be used
- Heifers should be joined for a short period whilst slowly reducing the joining period in the cow herd over several years. Large reductions in joining periods too quickly may result in unacceptably low pregnancy rates
- Pregnancy testing (performed by an adequately trained veterinarian or experienced individual) the herd early (say 6 weeks after the bulls are removed) will enable you to accurately age foetuses and ensure that you select early pregnant females and late pregnant females can be sold as "preg-tested in-calf" thus further tightening the joining period
- Under good seasonal conditions, aim to reduce joining period by 1-2 weeks/year

## TIP

Prioritise nutritional feed to younger females (first and second calvers)

# WHAT ARE THE STRATEGIES TO MINIMISE RISK?

## What are the strategies to minimise the risks associated with a short joining period?

Many producers are concerned that short joining periods may result in not having enough replacement heifers. By maintaining retention rates above 70%, you are likely to have ample replacement females, even if the pregnancy rate is a bit lower. By joining just enough replacements, the risk of low pregnancy rates may be increased and the flexibility with culling policies may be decreased.<sup>14</sup>

Herds with shorter joining periods (<9 weeks) quickly find that they can join most heifers as they are older and heavier. **The critical strategy is to have a high heifer retention, pregnancy test the herd and cull empty cows.** A system joining their herd for 6 weeks, with 85% pregnancy rate and culling empty cows will be more productive than a herd joining for 20 weeks with 98% pregnancy rate.

Any unacceptably low pregnancy rates should be investigated to rule out bull problems or potential infectious reproductive diseases such as vibriosis, pestivirus and leptospirosis (vaccines available).

## TIP

- Eliminate the risks associated with short joining periods by ensuring heifer retention rates are high (above 70%).
- Early pregnancy testing is advisable. To tighten calving periods, consider foetal aging at the same time to eliminate late pregnancies from the herd.
- Consult your veterinarian or an experienced advisor for more advice on achieving shorter joining periods.

## SUMMARY

- The recommended joining period in southern Australia is 9 weeks for cow herd and 6 weeks for the heifers.<sup>2,5</sup> Reducing the duration may mean that:
  - A 12-month cycle can be maintained – Cows have longer to recover so conception rates won't be affected in the year ahead
  - Heifers that should be retained are evident – Identify superior calves at weaning
  - Heavier and more consistent animals are produced for sale
  - Labour requirements substantially reduced
  - In good seasonal conditions, aim to reduce joining by 1-2 weeks/year as any large reductions may result in unacceptably low pregnancy rates.

Finding and adjusting to the optimal joining period may take several years to achieve, however, in the long run, both your business and herd will benefit from the outcomes of a shortened joining period.

## Points to consider

### Nutrition<sup>7</sup>

- Prioritise pasture to first and second calvers.
- Consider fitting the time of calving with your pasture growth curve.
- When there are nutritional challenges at joining, consider joining maiden heifers 3 weeks prior the main herd to allow more post-calving recovery time.

### Heifer retention

- Manage risk by retaining a high proportion (>70%) of heifers to join early.

### Bulls<sup>15</sup>

- Calculate the number of bulls required for joining, a minimum of 2 bulls per 100 cows or per herd (for herds with <100 cows) should be used.
- Use highly fertile bulls who have passed a breeding soundness evaluation (BSE) performed by a veterinarian.

### Pregnancy testing<sup>6</sup>

- Early preg-testing determines late pregnant females. Consider selling as preg-tested in-calf.

# THANK YOU

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## GLOSSARY

**Anoestrus interval:** The period in time when no oestrus occurs in a female animal and the animal is not receptive to mating.

**Calf scours:** Increase in frequency and quantity of faeces, which has a higher than normal water content. In some cases, blood and mucous may also be present.

**Calving period:** Period of time between the birth of calves from the one cow.

**Condition score:** An assessment of an animal's body condition based on an estimate or measurement of the amount of fatty tissue under the skin on certain body parts. The objective of condition scoring is to obtain a simple and reliable estimate of the body fat reserves of live cattle. The condition score provides an estimate of fat reserves that is independent of size, and is a more reliable description of condition than liveweight alone. One condition score equals between 50–80kg live weight depending on frame size of the cattle.<sup>16</sup>

**Estimated breeding values (EBV):** An estimate of an animal's value as a parent for a particular production trait such as growth rate.

**Joining period:** The length of time for placing male animals with female animals for mating.

**References:** **1.** O'Brien G. Tightening the calving pattern. Victoria, Department of Primary Industries, 2013. **2.** Meat and Livestock Australia. More Beef from Pastures. Module 6: Weaner throughput. 2013. Meat and Livestock Australia. **3.** Meat and Livestock Australia. Making changes. Available from <http://www.mla.com.au/livestock-production/MLA-challenge/Bill-and-Georgia-Wilson/Making-changes#.VGwQjvmUcvi>, accessed November 2014. **4.** Data on File. John Webb-Ware 2013. **5.** Meat and Livestock Australia. More Beef from Pastures. Procedure 1: Maximise the number of live calves per female. 2013. Meat and Livestock Australia. **6.** NSW Department of Primary Industries. McConochie J. Selecting and managing beef heifers. New South Wales, Department of Primary Industries, 2007. Primefact #626. **7.** Victoria Department of Primary Industries, 2014. Management of beef breeding cows. Available from <http://www.depi.vic.gov.au/agriculture-and-food/livestock/beef/raising/beef-breeding/management-of-beef-breeding-cows>. Accessed November 2014. **8.** Chapter 17: Chinchilla Vet. Chapter 17. Interpreting pregnancy diagnosis results for extensive beef production in northern Australia. Available from <http://chinchillavet.com.au/Portals/chinchillavet/PDFs/Preg3.pdf>, accessed November 2014. **9.** Pitchford W, *et al.* Simultaneous genetic improvement of maternal productivity, feed efficiency and end-product traits in variable environments. 2014. Meat and Livestock Australia. **10.** Bertram J. Bull buying checklist. Future Beef, 2012. Available from <http://futurebeef.com.au/topics/raising-and-genetics/bull-breeding-soundness-examination-bbse/>, accessed September 2014. **11.** University of New England. Understanding days to calving EBVs. Available from <http://breedplan.une.edu.au/tips/Understanding%20Days%20to%20Calving%20EBVs.pdf>, accessed November 2014. **12.** Victoria, Department of Environment and Primary Industries, 1995. Soundness of testicles in beef bulls, note number AG014. Available from <http://www.depi.vic.gov.au/agriculture-and-food/livestock/beef/raising/soundness-of-testicles-in-beef-bulls>, accessed November 2014. **13.** Zoetis New Zealand Limited. Anoestrus in cattle. Available from <http://www.zoetis.co.nz/disease-and-condition/Anoestrus-in-Cattle>, accessed November 2014. **14.** Data on file. Rod Manning 2014. **15.** Meat and Livestock Australia. Procedure 2, Control the mating period to maintain selected annual calving dates. Available from <http://www.mla.com.au/mbfp/Weaner-throughput/2-Control-mating-period>, accessed September 2014. **16.** Feed.FIBRE.future. Are my beef cattle at the right condition score? 2007. Dairy Australia.

