MEAT & LIVESTOCK AUSTRALIA

TIPS & TOOLS

NORTHERN CATTLE

How do I manage heifers pre-joining to improve reproductive performance?

A heifer management program is crucial for effective performance of northern breeding herds. Planning from pre-joining to calving is essential for overall reproductive management.

Why is pre-joining heifer management so important?

- Heifers are the foundation of the future breeding herd.
- Young breeders aged two to four years old constitute more than 40% of a typical breeder herd.
- First-calf heifers take longer to get back in calf than adult breeders. At 80 days post-calving, 60–70% will have cycled compared to 80–89% in cows.
- Calf loss between pregnancy diagnosis and weaning is highest in maiden heifers.
- Improving reproductive performance in young breeders will significantly improve the productivity of the whole breeder herd.

Lifetime productivity

The key to improving lifetime productivity of all breeders is to ensure they get the best start possible when they first enter the breeder herd. This depends on several critical factors:

- choosing the best time for your herd to calve
- ensuring replacement heifers are all cycling when the bulls go in
- restricting the joining period for heifers so they don't calve out of season
- implementation of strategies to minimise calf loss.

Selecting the joining date

Here are some key considerations when planning heifer management:

- Nutrition and the annual pasture curve is extremely important in many regions, especially where seasonal feed troughs last for extended periods every year in the dry tropics of northern Australia. Establishing the 'green date' is a very useful strategy (see section below).
- It's more problematic to set a joining date in regions of high rainfall variability.
- Producers will likely need to rely on dependable spring rainfall to target premium weaner markets in late autumn.

The green date

'Green date' is a useful concept in grazing systems where summer perennial grasses are the main component of the pasture base. It's usually defined as the number of days after 1 October to achieve a 70% chance of receiving 50mm of rain over a maximum of three days. It's based on soil temperatures and pasture responses to a specified amount of rain.

For more information, visit: climateapp.net.au

If using a 'green date', joining should commence one month after the 'green date' so that in most years, there will be a good body of feed available when breeders are lactating and cycling.

Critical mating weight

Critical mating weight is the target weight for maiden heifers when they're first joined to bulls to achieve an 84% pregnancy rate in a six-week joining period, or two complete reproductive cycles. This is based on the expectation that 60% should conceive within the first cycle of three weeks and that 60% of the remaining 40% will conceive in the second cycle of three weeks (60% cycle 1 + (24% cycle 2) = 84%).

Critical mating weight varies between breeds and within breeds but can be calculated if heifers are weighed just prior to joining and accurate foetal ageing is performed at pregnancy testing.

Both age and weight at puberty are highly heritable traits but age at puberty is affected by growth rate – faster growing animals reach their critical mating weight at a lighter weight and a younger age.

Weight at puberty is a very practical and easy to measure trait that commercial beef producers can establish for their own breed of cattle and implement in their heifer management programs (see table).

The critical mating weight has not been established for all breeds of cattle in northern Australia. It varies within breeds and is heavier than age at puberty because the first few reproductive cycles after reaching puberty are not always fertile.

Breed	Age at puberty (months)	Weight at puberty (kg)
Holstein - Friesian US	12 to 13	265-289
Holstein - Friesian AUS	8 to 12	200-230
Jersey	8 to 10	100-180
Brown Swiss	10 to 11	280-300
Charolais	12 to 13	320-355
Angus	13 to 14	320-355
Hereford	14 to 15	300-310
Simmental	11 to 12	320-330
Brahman type	17 to 27	330-350

Why aim for such a short joining period?

A common scenario in northern Australia is to select replacement heifers on size and looks without knowing if they attained their critical mating weight.

Bulls are put in with heifers just prior to the start of the wet season and joining occurs continuously into the dry season as the heifers grow and reach puberty. Conception rates when pregnancy tested in the middle of the year are usually good but no consideration has been given to the spread of the pregnancies and when they will calve down.

Consequently, a heifer that conceives late will fail to get back in calf the following season.

It's not *if* the heifer gets pregnant but *when* the heifer gets pregnant that determines lifetime performance.

Genetic improvement

Age and weight at puberty are highly heritable traits and while selecting heifers that get pregnant early will ensure genetic improvement is occurring, the main focus needs to be on sire selection. Use bulls with above average estimated breeding values (EBVs) for days to calving.

In addition, scrotal circumference in bulls is moderately genetically-correlated with age of puberty in heifers. If bulls with appropriate EBVs can't be sourced, selection of sires from breeders that have had good reproductive performance as young breeders is paramount.

Other considerations

Yearling mating (joining at 15 months of age) can significantly improve profitability; however, it's closely related to nutrition. A general rule of thumb is that weaning weights >240kg and annual growth rates >150kg/year are essential. On poorer country, feed inputs become too expensive and breeder re-conception rates during first lactation can be very low if additional feed is not supplied.

Dystocia is most common in maiden heifers as the calf is too large for a small pelvic opening which is not fully developed. Instigate a management plan based on bull selection (low birth weight and positive calving ease EBVs). High levels of protein in mid-semester increase

foetal weight but this can be difficult to manage in practice. Pelvimetry identifies heifers with small pelvic areas but cannot predict individual cases as the calf size is unknown, but assists in reducing the herd prevalence.

Spike feeding will improve re-conception rates of first-calf heifers. Protein meal supplementation to maiden heifers in their last trimester of pregnancy can lift re-conception rates by about 10%.

See the heifer management calendar on page 4 for an example of where spike feeding can fit into the plan.

> It may take several years to achieve an ideal heifer management strategy and even longer for the benefits to flow through the breeder herd, but the improvements in herd productivity will justify the effort.

The heifer management plan

Pre-joining

- Establish a joining date and plan a strategy to achieve critical mating weight by that date.
- Identify cost-effective strategies to reach critical mating weights. For example:
  1. Conservatively stock heifer paddocks and supplement if necessary during the dry season prior to joining.
  2. Assess phosphorus status of the heifer paddocks and supplement during the growing season if deficient.
  3. Monitor faecal egg counts and drench if required.
- Purchase bulls or ensure home-grown bulls have had a Bull Breeding Soundness Examination and are vaccinated against vibriosis and pestivirus or are not a persistently infected animal. If dystocia is an issue, choose bulls with low EBVs for birth weight.
- Perform a risk assessment for all common diseases and vaccinate where necessary.
- Put bulls in either just before the wet season (where it's difficult to get them out at the start of the joining period) or a month after the green date.
- Over-mate heifers i.e. join more than required and make final selection on foetal ageing results.

Joining period

- Monitor bulls routinely for sickness, injuries or absenteeism.

Post-joining

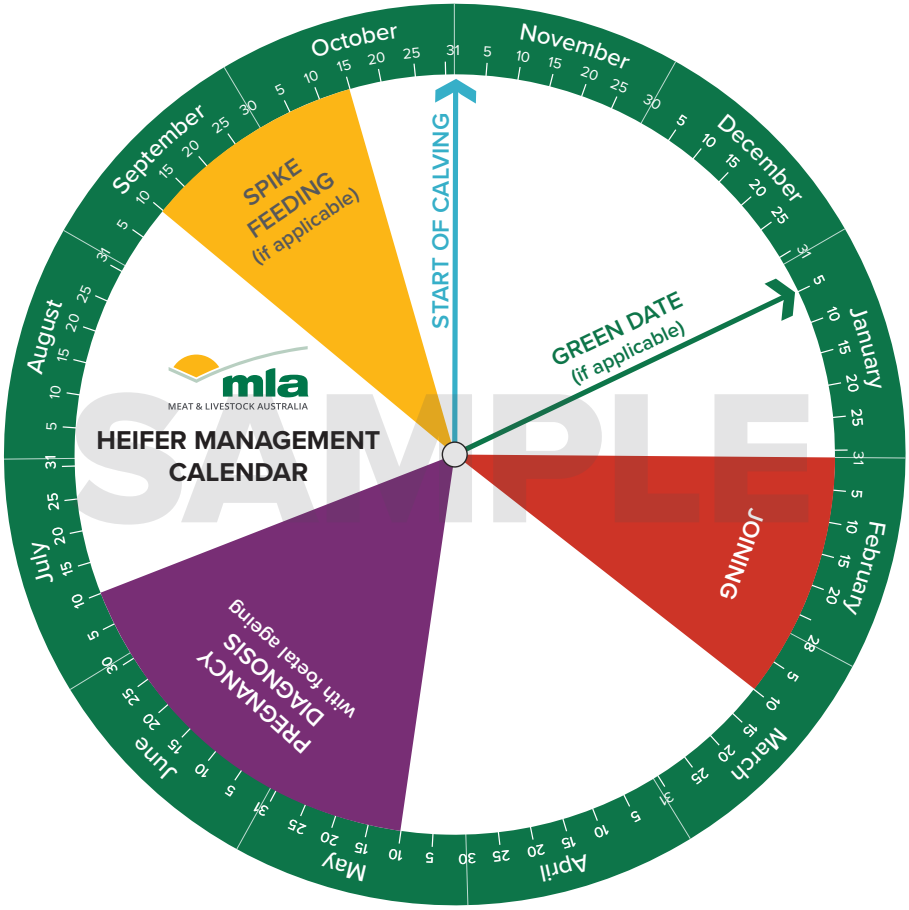
- Pregnancy test heifers about four to five months after the start of the joining period and insist on foetal ageing when the pregnancy diagnosis is performed.
- Select replacement heifers on temperament, then on stage of pregnancy. Attempt to retain as many as possible that conceived early in the joining period.
- Leptospirosis is a potential workplace health and safety issue. If implementing a program, it's best to vaccinate pregnant replacement heifers at pregnancy diagnosis to ensure good immunity.
- If conception rate of first-calf cows is a major problem, consider a protein meal supplement for heifers during their last trimester of pregnancy. Aim for good nutrition but avoid over-fat heifers.

Calving

- Ensure heifers have shade in their paddock.
- Avoid mustering around calving as this can increase calf loss.
- Avoid handling animals during extremely hot weather.
- Prepare to wean early if seasonal conditions are poor and heifers are losing body condition.

Heifer management calendar

See figure below for a sample heifer management calendar in the northern tropics. To create your own calendar wheel, see instructions on sheet attached.



More information

You can download the full Tips & Tools suite at: www.mla.com.au/reproperf, including:

- What females should I sell?
- What joining system should I use?
- What's causing reproductive loss?

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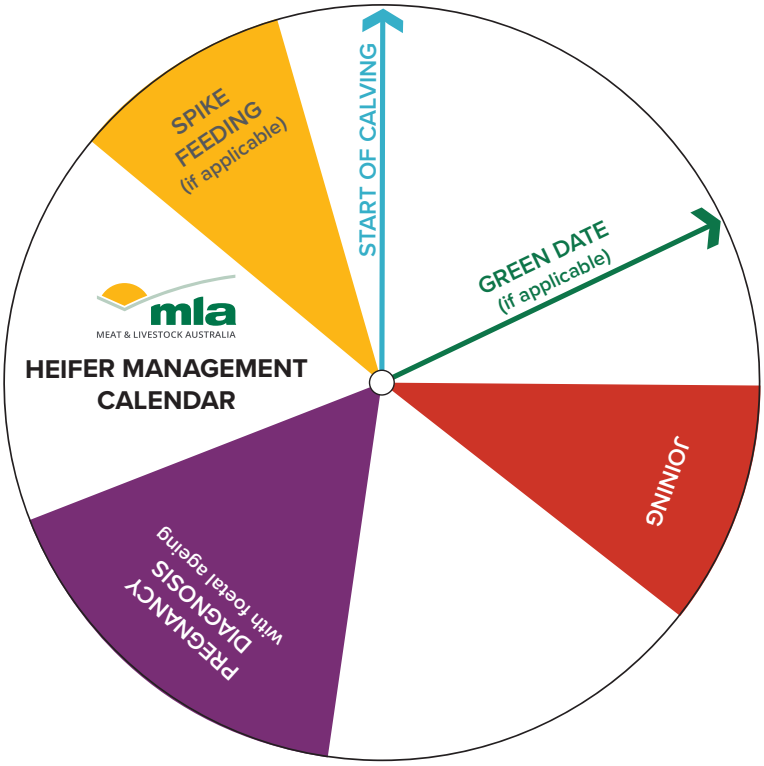
Heifer management calendar

You can create your own heifer management calendar by cutting out Circle 1 and Circle 2.

Step 1 Cut out both circles. Place Circle 1 on top of Circle 2 and secure by placing a thumb tack in the centre (see small white circle in the middle of Circle 1).

Step 2 Manually adjust the calendar by spinning Circle 1. Line up Circle 1 and Circle 2 so that the red 'Joining' triangle aligns with your desired joining period.

Circle 1 ›



Circle 2 ›