TIPS & TOOLS

NORTHERN CATTLE

What causes calf loss?

Calf loss can be a significant contributor to reproductive inefficiency in a breeder herd. It includes losses that occur after a breeding cow has been categorised as being pregnant, right through to weaning.

The best approach to maximise the number of calves from birth to weaning is:

- determine if a problem exists (see MLA fact sheet: *Calf loss – do I have a problem?* at mla.com.au/calf-loss)
- identify at what stage the losses may be occurring
- diagnose the cause of the losses (if possible)
- implement time-bound strategies to address the problem.

Numerous factors can contribute to calf loss – in fact, multiple factors can often be apparent in the same herd.

Calf loss can be described under two distinct categories:

1. **Maternal factors** directly associated with the breeder cow.
2. **Offspring factors** relating specifically to the calf.

Many of the maternal factors affecting calf loss in northern Australia have been identified via the MLA-funded 'Cashcow' (mla.com.au/cashcow) and 'Calf wastage' (mla.com.au/calf-wastage) projects.

Maternal factors

Lactated in the previous year

The MLA Cashcow project found cows that failed to rear a calf the previous year were more likely to lose their calf again in the subsequent pregnancy. These present as fat cows (usually pregnant) and are potential carriers of ongoing health issues/diseases in the herd.

Body condition score (BCS) at pregnancy diagnosis

Cows in low body condition when they're pregnancy tested (usually when their current calf is around 4–7 months old) are more likely to lose the calf. Low body condition at pregnancy testing is directly related to:

- poor body condition at calving
- poorer quality colostrum for the newborn calf
- less milk available on an ongoing basis.

Calves born in drought conditions are also more likely to develop calf scours. Stocking rates, supplementation and weaning options need addressing to minimise the number of cows in low body condition at pregnancy testing.

Cow age

Both maiden (calving for the first time) heifers and aged cows have higher rates of calf loss than mature breeders.

Maiden heifers are regarded as a high-risk group because they are:

- more susceptible to viral diseases which impact reproductive performance
- at a higher risk of having birthing difficulties (dystocia) and mothering issues
- mothering ability is less developed first time round.

Aged cows are also considered high risk as they're generally less likely to maintain body condition.

Maiden heifers need extra time to develop a strong cow-calf bond after birth. They're also more prone to dystocia because their pelvic opening has not reached its maximum size.

Mustered around calving

The disruption of the cow-calf bond – especially when the calf is less than two weeks of age – is a major issue for breeding herds and aerial mustering may exacerbate this problem.

In continuously joined herds where calves can be born all year round, it's almost impossible to define an ideal time to muster. Therefore, it's important to consider:

- size of paddock
- distance to yards
- duration breeders are being held in the yards.

Operators need to be aware of potential losses if newborn calves are unable to keep up with the mob.

Heat stress

The Cashcow project found that calf loss increased in the months when the thermal heat index (THI) exceeded 79 for more than 15 days, in all regions except the northern forest country.

THI is a factor of both temperature and humidity and therefore a high THI is most likely to occur in the summer months (December– February). The inability to demonstrate a THI effect in northern forest country could be related to tree cover and higher *Bos indicus* breed content.

Provision of paddocks with some trees and close proximity to water (rule of thumb = <2km to nearest water source) and avoiding calving during the hottest time of year may be useful strategies for high-risk groups.

Phosphorus (P) deficiency

Phosphorus-deficient regions are prone to higher calf loss. Breeders eat less feed during the wet season if there is inadequate phosphorus available in the pastures (regardless of the pasture quantity and quality), so calf loss is associated with low body weights and low condition scores of breeder cows. Breeders in poor body condition have poor quality colostrum and produce less milk.

Breeders in P deficient country don't eat enough pastures over the wet season, causing low body weight and condition. This reflects on both the quality and quantity of the milk produced.

In extreme cases, 'peg leg' develops as P reserves are used and causes the animal to become lame, which means they're unable to forage effectively.

Bottle teats and udder abnormalities

Calves are unable to access milk from a breeder cow with bottle teats, and cows with mastitis will often kick the calf away if her udder is inflamed, sore and swollen. In breeding herds, it is recommended producers cull cows with bottle teats or mastitis.

Newborn calves simply can't get their mouth around large sore teats. The teats become extremely large at the time of birth, as the milk can't be extracted by the calf.

Country type

MLA's Cashcow project found marked variation in the level of calf loss within regions and between regions. While calf loss was a factor affecting reproductive performance in all herds in northern Australia, the biggest challenges were in the far northern regions where the following factors magnify the challenges for producers:

- the scale of operations
- environmental conditions/heat stress
- the higher proportion of heifers retained
- year-round calving
- pasture quality
- predators such as wild dogs
- insect-borne diseases.

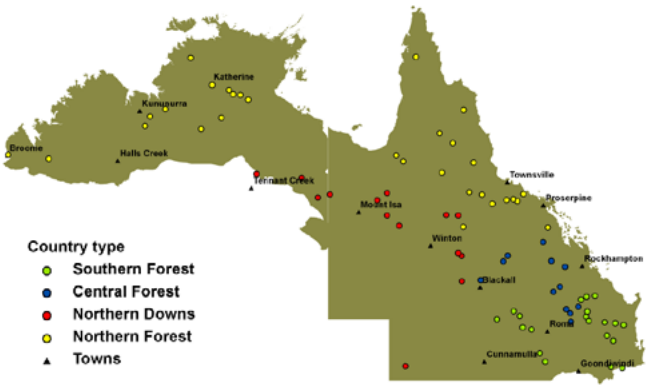
Table 1: Observed reproductive performance (median, inter-quartile range*) of cow mobs by country type

Measure	Foetal/calf loss (%)
Southern Forest	5 (2–9)
Central Forest	6 (5–9)
Northern Downs	8 (5–14)
Northern Forest	13 (9–18)

*25th–75th percentile values

Source: Cashcow project (mla.com.au/cashcow)

Figure 1: Northern beef producing regions by country type



Diseases

There are many diseases that can be the maternal cause of calf loss. Most of them are sporadic and only occur when the conditions are right, while others are present all the time and can be controlled by vaccination and good management.

Infections that occur during pregnancy usually result in abortion or a calf that won't survive. Cows generally show few or no clinical signs and therefore often go unnoticed unless an aborted foetus, uterine discharge or retained placenta is observed. See MLA's Tips & Tools: *What's causing reproductive loss?* for more information.

There are numerous causes of abortion in beef cattle, from infectious agents to toxic plants. The aborted foetus is seldom seen in extensive operations and is frequently eaten by wild dogs, feral pigs or birds of prey.

Pestivirus

This virus is spread by direct contact. The impact on reproductive performance varies according to the time of infection:

- **Mating:** failure to conceive or early embryonic death may occur.
- **After implantation of the embryo and in the first trimester of pregnancy:** embryonic loss may occur or, alternatively, the embryo can develop into a calf that is a 'persistently infected' or a carrier animal.
- **Second trimester of pregnancy:** abortion usually occurs.
- **Last stages of pregnancy:** may cause late-term abortion or result in birth deformities.

Pestivirus is very common in beef herds throughout Australia and can cause the greatest losses when naïve (cows with no immunity against the virus) pregnant females come in contact with a carrier animal.

✓ Vaccine status: **Available**

Bovine campylobacteriosis (vibriosis)

Vibriosis is a venereal disease spread by the bull during mating. It usually causes early embryonic loss and infection of the reproductive tract, which is reflected in low pregnancy rates.

The *campylobacter* organism also has the potential to become latent and cause abortion later on in the pregnancy.

✓ Vaccine status: **Available**

Leptospirosis

Leptospirosis is a disease that causes abortion in late pregnancy and is spread by ingestion or absorption of the organism through broken skin or mucous membranes. It's widespread in Australia but appears to only cause problems in low-lying wet areas in naïve pregnant females. Rats and feral pigs are carrier animals and the disease can be contracted by humans.

✓ Vaccine status: **Available**

Neosporosis

Neospora is a parasite spread by faecal contamination of the pastures by wild dogs and dingoes. It's prevalent in Australian cattle, causing the occasional abortion outbreak in southern dairy herds, and mostly suspected, but infrequent, individual abortions in northern beef herds.

The organism can also be dormant in breeder cows and cause subsequent abortions in the same animal. These cows typically present as fat dry cows at weaning. The disease can be diagnosed with a blood test.

✗ Vaccine status: **Not available**

Arbo (insect-borne) viruses

A number of viruses are spread by biting insects (mosquitoes and midges/culicoides) which can cause abortion. Abortions are usually observed in the first trimester of pregnancy and recorded as 'non pregnant' animals.

Akabane (and to a lesser extent aino virus) present differently. Depending on when the infection occurs, the foetus can become infected but not actually die and be aborted. The cerebellum in the brain of the foetus is impacted, muscle movements of the foetus are restricted and a calf is born with grossly deformed limbs (curly calf syndrome).

Diagnosis of akabane is often problematic unless a freshly found foetus or calf can be autopsied. Antibody tests may provide an indication but a definitive diagnosis is difficult when the prevalence of the virus is widespread.

Outbreaks are usually associated with a big wet after a series of dry seasons, resulting in a low level of herd immunity. Natural immunity is usually lifelong for most arbo virus infections.

✗ Vaccine status: **Not available**

Bluetongue is usually asymptomatic in adults and the severity of the clinical signs in cases of **ephemeral fever (three-day sickness)** is usually age-related. Both viruses can cause early abortion.

✓ Vaccine status: **Available for ephemeral fever**

More information is available on the National Arbovirus Monitoring Program website: animalhealthaustralia.com.au

Mismothering

A mother's milk is a necessity for calf survival in the first six weeks after birth and is essential for development of a cow-calf bond.

Calves acquire their antibodies via colostrum, with maximum transfer occurring immediately after birth or within the first 12 hours (the absorption of antibodies in the gut ceases after that time). Suckling produces the release of the hormone oxytocin, which enables the cow to 'let down' her milk.

Risk factors which contribute to mismothering:

- fear of predators (even humans)
- mustering
- heifers on their first calf
- birth in yards
- severe weather events.

Giving birth for the first time can be a stressful experience for a maiden heifer. A stress-free environment provides the best conditions to ensure a strong cow-calf bond is developed.

Dystocia

Difficulty in the birth process *(dystocia)* occurs in all breeds and at all ages from time to time. It can be a major cause of calf loss, especially in maiden heifers – in severe cases, the heifer can potentially die in the process. This cause of calf loss is both a maternal and a calf issue.

In maiden heifers, the problem is usually when a calf is too big and is trying to get through a pelvic opening that is too small because the heifer hasn't yet reached their mature frame size. Genetics and nutrition are the main risk factors for *dystocia*, which becomes more accentuated in yearling-mated heifers.

Management strategies include:

- purchasing bulls with low birth weight
- using estimated breeding values for ease of calving
- avoiding 'over nutrition' (especially high-protein diets) during the second trimester.

When the calf is too big to pass through the pelvis of a maiden heifer, the only way to achieve a live calf is by performing a caesarian. This option is very costly and is not available to the majority of beef breeders in northern Australia.

Calf factors

Shade

Whether the provision of shade (trees or shelters) has any impact on calf survival is largely unknown; however, shade's importance in thermoregulation has been well recognised in the feedlot industry.

One management strategy producers could implement to lessen the risk of heat exposure is to ensure breeders are moved to paddocks with trees or shade structures.

Some properties are already providing shade around bores on the black soil plains. Long, narrow shade structures need to be aligned north–south so the sun has access to all shaded areas for drying accumulated dung.

Calf birth weight

Both low calf birth weight and high calf birth weight are risk factors in calf survival. Calves with a birth weight <29kg can be four times more likely to die than calves that are 32–35kg at birth.

Small calves have less body reserves and are generally weaker when born. Very heavy birth weight calves are more likely to experience a difficult calving and even *dystocia* – especially in maiden heifers.

Viruses

Corona and rota viruses are common pathogens in the environment and usually affect calves in the first few weeks of life, with the main symptom being scours/diarrhoea.

Coronaviruses are more likely to occur in the colder months whereas, rotavirus transmits well at normal temperatures and humidity.

More commonly, viral infections are associated with mixed pathogens such as E. coli, which causes calf deaths in the first few months of life, especially in drought and dry times when both the quality and quantity of colostrum is poor.

Treatment of beef calves is problematic in extensive herds as the calves need to be caught to be treated. Injectable, long-acting antibiotics that kill gram negative organisms are the only option in most grazing operations where daily medication is problematic.

✓ Vaccine status: **a vaccine protecting against corona/rota/E. coli is available and should be administered to cows late in their pregnancy to have maximum effect.**

Calves with diarrhoea can be identified by the dags on their tail and around their perineal area. Catching affected calves to treat them can be problematic – avoid excessive stress if capture is attempted. Providing fluids is essential in animals that are close to death.

Wild dogs

The role of wild dogs in calf loss has been widely debated over many years. The impact of predators is complicated by the presence and availability of wildlife, as well as abundance of other food sources because calves are not preferred.

Wild dogs can cause significant loss of calves and weaners by:

- directly killing the young animal
- infection and/or death from wounds.

Chewed ears or tails in adult cattle are definitive signs that wild dogs are a problem on the property.

Navel ill

Occasionally, calf deaths can be caused by infections of the navel cord. The infections ascend into the abdomen via the umbilicus after birth and are often associated with a patent urachus (failure of bladder closure immediately after birth). Death occurs if the infection is severe, while in other cases, calves can develop a chronic discharge and fail to thrive.

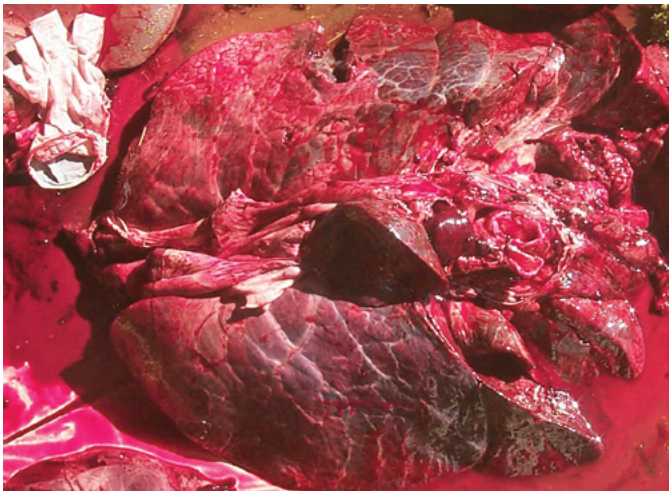
Septicaemia and respiratory disease

Severe bacterial infections can occur sporadically in newborn calves and are usually fatal unless treated immediately. Animals will nearly always have an elevated rectal temperature (>40°C) and their conjunctivae (mucus membrane of the eyes) will be inflamed and quite red.

Affected animals may exhibit:

- severe respiratory distress
- purulent nasal discharges
- gurgling lung noises when breathing.

The syndrome is more prevalent during drought and is generally associated with poor passive immunity and uptake of antibodies from the colostrum.



Lungs that are severely infected by septicaemia and respiratory disease are dark crimson/purple in colour and solid (pictured). Normal lungs are pink and spongy.

Clostridial diseases

The clostridial group of bacteria are ubiquitous and are found on all properties. They survive as spores in the ground, producing deadly toxins when they invade the body. Treatment is largely ineffective, however, an effective vaccine can prevent these diseases.

The diseases caused by clostridial bacteria include tetanus, blackleg, gas gangrene and pulpy kidney. Blackleg causes sudden death and is most likely to be seen after stock graze areas that have been recently flooded.

Tetanus and gas gangrene are most likely associated with wounds that have poor drainage. Vaccination with 5-in-1 vaccine is highly recommended and provides protection against pulpy kidney disease – all animals will benefit from an injection at weaning.

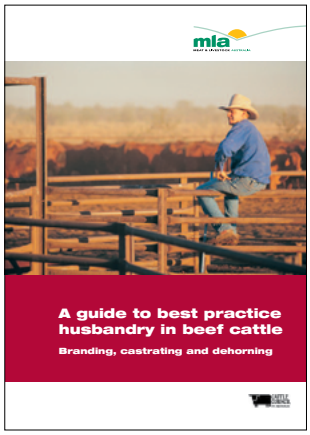
✓ Vaccine status: **available for tetanus, gas gangrene and pulpy kidney disease**

Animal husbandry procedures

One of the incidental findings from the Cooperative Research Centre (CRC) in northern Australia was a 2.1% loss in calves between branding and weaning in animals that were not castrated but were dehorned and branded (Bunter 2013). The most likely cause of calf loss from these procedures are hemorrhage or wound infection from organisms other than clostridia.

Losses can be minimised if:

- all husbandry procedures are performed at a young age
- the correct procedures are followed by staff who have been trained appropriately.



The national standards and guidelines on animal welfare have been adopted by all states.

All producers need to ensure staff performing basic animal husbandry procedures have been correctly trained and are familiar with the best practice guidelines.

More information: futurebeef.com.au and search 'guide to best practice husbandry'.

Vitamin A deficiency

The syndrome usually occurs after a failed wet season and is most likely associated with treeless black soil plains where breeder cows cannot access green leaf material which contains carotene – a precursor of vitamin A.

Clinical signs of vitamin A deficiency vary, but commonly include:

- mild to severe ataxia
- difficulty finding a teat and sucking
- blindness (partial or complete, as judged by avoidance of obstacles)
- listlessness with prominent drooping of the head.

Recognising the seasonal conditions that lead to the syndrome and treating pregnant breeder cows with injectable vitamins (A, D and E) will help manage the problem.

Browse plays an important role during drought. If the wet season fails and there is little green pasture, cows cannot replenish their stores of liver Vitamin A.

Ticks

There are few reports of newborn calves dying from cattle tick or tick fever. If calves are born in a tick endemic zone, their mother will probably have acquired immunity to tick-borne diseases and consequently the offspring are protected up to weaner age.

Scrub ticks (paralysis ticks) pose a much bigger threat in coastal areas where these ticks survive. One or two scrub ticks can cause paralysis and death in newborn calves.

Doramectin injectable or ear tags are available if problems exist.

Genetic defects

There are a number of genetic disorders affecting beef cattle which are breed-specific.

Genetic disease can cause calf losses due to:

- poor animal performance
- structural unsoundness
- premature death.

Most genetic diseases are recessive and rare but if they do occur, there are economic consequences. Breed associations and genetic testing companies can provide testing protocols for genetic defects associated with a particular breed.

Many diseases and toxic plants can cause death in both adult and unweaned calves. However, the problems listed below have focused on those entities directly affecting the unborn and young animal.

Table 2: Genetic diseases which can cause calf loss

Disease	Common name
Achondroplasia	Bulldog dwarfism
Ankylosis	Abnormal union of any joints in calf
Brachygnathia inferior	Parrot mouth
Fawn calf syndrome	Abnormal crouched posture at birth
Hypotrichosis	Hairlessness or rat-tail
Ideopathic epilepsy	Neurological disorder causing seizures
Mannosidosis	Lethal nervous disease
Neuropathic hydrocephalus	Water head
Osteopetrosis	Marble bone disease
Pompe's disease	Glycogen storage disorder
Protoporphyria	Photosensitivity

More information

You can download the full Tips & Tools suite at: mla.com.au/repro-performance, including:

- *What females should I sell?*
- *What joining system should I use?*
- *How do I manage heifers pre-joining to improve reproductive performance?*
- *Calf loss – do I have a problem?*
- *What causes calf loss?*
- *How do I select and manage bulls?*

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