Minimising calving difficulties

Information compiled by Katie Brian, AHDB Beef & Lamb and David Black, Paragon Veterinary Group/XLVets

Key messages

+ Cows with a BCS of 2.5-3.0 at calving tend to have a shorter interval to first heat
+ In general, very fat or very thin cows are at greater risk of difficulties around calving
+ It is important to manage feeding throughout the year to optimise cow body condition at each stage of the production cycle
+ EBVs can be used to select bulls that produce females that are likely to calve more easily and have shorter pregnancies
+ It is important the dam is up-to-date with her vaccinations and in good health
+ Be prepared before calving begins with suitable dry, clean shelter, plus handling facilities and basic equipment on hand
+ Record birth dates and birthweights of each calf to track the reproductive efficiency of the cow and the bull
+ When faced with a cow in difficulty, be patient, think about hygiene and use plenty of lubrication
+ It is vitally important that ropes and/or pulley systems are attached correctly to prevent injury to the calf
+ Calving problems due to a relatively oversized calf are common in beef cattle
+ Leave cows and heifers undisturbed for four hours after mucus/slime is first seen at the vulva, unless the animal is clearly having powerful contractions every five minutes or so
+ It is easier to correct a malposition of the calf when the cow is standing, as it can be pushed back or manipulated
+ Colostrum contains nutrients as well as antibodies, but needs to be consumed by the calf within six hours of birth for it to acquire satisfactory passive immunity
+ Cows should pass the placenta within 12-24 hours after calving. If it has not been passed in this time, treatment is advised to prevent infection
+ To achieve a 365-day calving interval, cows have around 80 days before they need to conceive the next pregnancy

Keywords:
Difficult calving, dystocia, suckler cow calving, calving equipment, human intervention at calving, stages of calving, malpresentation of calves at birth, health problems at calving
Introduction

The birth of a calf represents a significant investment in time, effort and money and is the only annual output of a beef cow. If the calf dies, the entire annual productivity of the mother is lost.

Ideally all cows should calve on their own unassisted. They should also become pregnant again as early in the subsequent breeding season as possible.

Planning for all possible outcomes is the best way to prepare for a calving season. The aim is to have a tight calving period, with as many cows and heifers as possible giving birth to healthy offspring, with little difficulty and no human interference.

To ensure heifers are big enough at calving they should be 65% of their mature weight at first service.

Calving can be regarded as being unsuccessful when:
• Cows die as a result of calving difficulties
• Calves are born dead
• Calves are injured during birth, or do not receive sufficient colostrum which leaves them susceptible to infections resulting in poor performance or death
• Cows are barren
• Cows suffer health problems around calving, which reduces their subsequent fertility

Dystocia is the technical term for difficult calving and can be caused by:
• Calf effects, eg high birthweight or deformity
• Cow effects, eg inappropriate body condition, age, pelvic size or shape, or disease contracted just before, during or after calving
• Foetal position at birth, about 5% of calves present in an abnormal position

In the recent Fallen Stock project, around 9% of the adult cows examined died due to infections caused by damage around calving, with a further 5% of deaths being due to complications after caesareans. These losses are significant, even before the cost of the lost or orphaned calf is taken into account.

However, there are many actions farmers can take to minimise this type of loss in their suckler herd.

With thanks to David Black, XLVets and NADIS for photography.
During pregnancy

Body condition

Body Condition Score (BCS) at calving is closely related to how quickly cows will start their reproductive cycles again after they have given birth. Cows in the correct BCS at calving (2.5-3.0) tend to have a shorter interval to first heat and are likely to get back in calf more easily.

It is important to record and monitor body condition and look out for any cows unexpectedly losing, or failing to gain condition, as this could indicate an underlying health problem. Consult the vet about investigating cows with such issues.

In general, very fat or very thin cows are at greater risk of difficulties around calving.

Cows that are too fat in late pregnancy are likely to have problems due to fat deposition that narrows the birth canal. Thin cows have less body reserves and are more prone to metabolic diseases. They also produce less colostrum, often of poor quality, which can result in weak calves.

Feeding

It is important to manage feeding throughout the year to optimise body condition at each stage of the production cycle.

Body condition tends to vary throughout the year with feed supply. However it is best to avoid extremes and rapid changes in BCS. In particular, cows should not fall below BCS 2.5. If suckling cows are too thin, weaning the calves earlier than usual will enable body condition to be regained.

At winter housing, cows should be assessed, grouped and fed to achieve target BCS six weeks before calving starts. Forage should be analysed and a ration offered appropriate to the condition of each group.

Cow condition score should be monitored at all times, but especially in mid and late pregnancy, at calving, service and weaning.

Adjusting the ration can help prevent milk fever (hypocalcaemia) and staggers (hypomagnesaemia). Feeding an appropriate dry cow mineral during the latter part of pregnancy will help reduce the incidence of these metabolic diseases and ensure adequate minerals are passed onto the calf before birth.

It is important to know what the mineral status is, both of the land and the animals. There are many minerals that cattle need during pregnancy and some complex interactions between them.

It is a good idea to take forage samples and blood samples for analysis and discuss the results with the vet or nutritionist. It may be necessary to supplement the diet with mineral boluses, injections, drenches or via the water or ration. Common minerals which can affect fertility, calving, calf health and growth are molybdenum, iron, copper, selenium, vitamin E, cobalt and iodine.
Bull effects

It is vital that the bulls used to serve the cows are fertile to achieve a compact calving period. Carrying out a bull MOT and fertility tests can identify sires that are infertile or sub-fertile. This should be done in plenty of time before the start of the mating season so that, if necessary, an alternative bull can be sourced or AI can be planned.

Bulls with lower than optimum fertility may still get cows in-calf but at a lower rate, which will extend the calving period. Cows calving late are more prone to gaining condition, especially if on good quality grass, which can increase the likelihood of calving issues.

The foetus grows rapidly in the last few days of pregnancy. If the calf becomes too large in relation to the dam, an assisted calving or caesarean may be necessary. This outcome is costly and should be avoided if possible.

A cow’s gestation length is influenced by the breed of the bull she is mated to, but there is also genetic variation within bulls of the same breed. Calf birthweight and calving ease are influenced by gestation length, so choosing a bull with a relatively short gestation length can help to avoid difficult calvings.

Estimated Breeding Values (EBVs) can be used to select bulls that produce females that have slightly shorter pregnancies, as well as those that are likely to calve more easily. They are a good tool for preventing calving problems in a herd.

It is possible to check the figures for current or prospective bulls, or of bulls being used for artificial insemination (AI), by entering the ear number into the respective breed society database.

Check the bull’s:

+ Birthweight EBV – look for figures that are lower than the average for the breed
+ Ease of calving – look for figures that are better than breed average
+ Maternal calving ease when breeding replacements – a figure higher than breed average is preferable
+ Gestation length – a negative figure means a shorter gestation, which will tend to result in a smaller calf that is born more easily

Cow health status

As well as essential nutrients, the calf receives antibodies (immunity) from its mother via colostrum. It is important that the dam is up-to-date with her vaccinations and in good health.

Colostrum quality is vital to give the calf the best possible start. If the calf does not receive enough good quality colostrum in the first few hours of life, immunity will not be passed on from the mother and her offspring will be susceptible to disease.

Herd vaccination policy should be part of the herd health plan and discussed with the vet.
Before calving

It is important to be prepared before calving begins. Suitable clean and dry shelter should be ready and available, as well as handling facilities and some basic equipment, eg:

- Clean calving ropes
- Long gloves
- Ear tags and applicator
- Tincture of iodine for dipping calf navels
- Calf-feeding bottles
- A calving aid or pulleys – if confident to use them
- Calving lubricant
- Clean needles and syringes and some basic medicines – consult the vet what is needed
- Disinfectant
- Oesophageal feeder (stomach tube)
- Torch
- Frozen colostrum

During the calving period

Provide shelter

If calving outside when the weather is cold and wet, provide a place for the calves to shelter. Keep these areas clean and dry to prevent disease.

Records

Record birth dates, birthweight of each calf and notes on calving difficulties. This valuable information can help track the reproductive efficiency of the cow and the bull and this can be used for other management purposes.

The birth process

As the calving season approaches, the cows will show signs they are about to give birth. These include:

- Udder development/bagging up
- Swelling of the vulva
- Slackening of the pelvic ligaments (the ligaments either side of the tail) which can result in the tail dropping
- Mucus/slimy discharge from the vulva
- Lack of appetite
- Isolation from the herd
- Restlessness
- Tail swishing

These changes will be slightly different from cow to cow and age is also a factor. A herdsman who knows the cows well and is checking them several times a day, will be able to spot these changes in behaviour fairly easily.

There are three stages to calving (see Table 1).
### Table 1: The three stages of calving

<table>
<thead>
<tr>
<th>Stage (preparatory)</th>
<th>Duration</th>
<th>Events</th>
<th>When to intervene</th>
</tr>
</thead>
</table>
| Stage One           | Two to eight hours | Cervix dilates  
Cow moves away from the others and is restless. May stand up then lie down several times  
Foetus positions itself ready for birth  
Foetus enters birth canal  
Cow starts to strain. At the end of Stage One this will happen every two to three minutes | This stage takes longer than six hours |
| Stage Two (delivery) | 30 minutes to four hours | Water bag appears and may burst  
Cow has contractions and strains every two to three minutes  
Foetus expelled | Water bag observed for one hour or longer and no calf, check presentation  
Straining for 30 minutes or longer and no progress made  
Stopping to rest for one hour or more and no progress made |
| Stage Three (membrane expulsion) | 30 minutes to eight hours | Placenta expelled | Placenta retained for more than 24 hours |

Source: www.progressivecattle.com

### Calving basics

Table 2 shows the impact of assisting cows to calve on the subsequent breeding season. It is clearly better to have cows calving on their own, rather than having human interference.

#### Table 2: The impact on subsequent breeding of giving assistance at calving

<table>
<thead>
<tr>
<th>Calving history</th>
<th>Number of cows</th>
<th>Subsequent breeding season success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>No assistance</td>
<td>81</td>
<td>96%</td>
</tr>
<tr>
<td>Assisted by stockperson</td>
<td>9</td>
<td>25%</td>
</tr>
<tr>
<td>Assisted by vet</td>
<td>6</td>
<td>34%</td>
</tr>
<tr>
<td>Caesarean</td>
<td>4</td>
<td>75%</td>
</tr>
</tbody>
</table>

Source: Data from NADIS - After Caldow and others (2005)

When faced with a cow in difficulty, be patient, think about hygiene and use plenty of lubrication.

### Patience

It is important to know if and when intervention is needed. Interfering too soon often does unnecessary damage.

Once calving begins, monitor progress. If nothing has happened after the cow has been straining for 30 minutes, check the calf is presented correctly.

After the water bag is first seen or has broken, heifers can be left for up to two hours and cows can be safely left alone for an hour.

If there is a problem, decide if it can be handled without veterinary assistance. But do not wait too long to call the vet, as dead calves are costly.
Hygiene
Always keep equipment and calving facilities clean and in good working order. The calving pen should be clean, dry, secure and safe for those working in it. Calving pens should be cleaned out between each calving if possible.

Lubrication
If assistance is required, apply plenty of obstetrical lubricant to help ease the calf through the birth canal. Various types are available, from gels to powders.

Technique
Always use properly designed heavy calving ropes. They should be placed on the legs with no twists, as this will damage the leg. Thin, hard ropes will also damage legs.

When attaching ropes to the calving jack, make sure the tension on each rope is equal. If this is not the case, all the force may be directed onto one leg and this is a common cause of leg injuries, or even fracture.

Ensure both legs and head are fully engaged in the birth canal before beginning to apply pressure. Using the jack as a lever by easing it down or to the side can be more effective than continuous jacking. Only one person should be controlling the jack.

Reasonable traction would be considered as two adults pulling steadily on calving ropes with no jerking. If the cow is being pulled backwards, this is too much traction.

It is worth remembering that a mechanical calving aid can apply the force of up to six people and is only for applying controlled steady traction. It is vitally important that ropes and/or pulley systems are attached correctly to prevent injury to the calf, and that the correct angles of traction are applied. Seek guidance from the vet about the right technique to use, to prevent damage to both cow and calf.

Calving protocol
Produce a plan for the calving period well in advance. This will help all staff understand what, when and how to manage all eventualities and know who to call if assistance is required.

Predicting calving
There are various tools which are available to help predict or alert to the start of calving. For example sensors can be inserted into the vagina or attached to the tail head and these can send a text message when calving is starting. Although not widely used yet, they appear to be useful as an aid and in particular may reduce the number of stillbirths caused by the start of calving being unobserved. Cameras in the calving pens can also be a useful aid to reduce workload and allow monitoring of the calves without disturbing them, thus reducing stress on the animals, especially heifers.

Potential calving problems

Leg back
This is a common presentation of calves, with the head and one foreleg presented at the vulva. The best option is to push the calf back if possible. However, if the calf is large, or the cow is pushing hard, a vet may have to give an epidural injection to prevent her from straining forcefully.

Lubricate the head and leg and push them back slowly. This will make it easier to reach the retained leg. Cup the foot with a hand to protect the uterus from sharp hoof edges and extend the leg through the pelvic canal. When both legs are at the vulva, apply calving ropes above the fetlock (wrist) joint. Slow, steady traction should be applied by two people pulling on the calving ropes from both legs, or a calving aid can be used.
**Head back**

This is a common problem and often in this presentation the calf is already dead. When the feet are both presented at the vulva this can be mistaken for a calf coming backwards. Check which way up the hooves are. Front legs have the hooves facing down and the knee joints can be felt further up, not the hocks, ie front legs have both joints flexing the same way, while the back leg has joints flexing in opposite directions.

It may not be easy to lift the calf’s head up and normally requires veterinary assistance. After giving the cow an epidural, the forelegs can be pushed back as far as possible to be able to reach the head. Then with fingers in the mouth or eye socket the head may be pulled straight and manipulated into the pelvic inlet.

If the calf is alive, it is preferable to get a head rope behind the ears and through the mouth (extreme care is needed) to help with the alignment and traction along the birth canal. If this is not possible, it may be possible to correct the misalignment of the head by pulling the nose round rather than the jaw. If the head is pulled by the jaw, great care must be taken as it can easily be damaged.

**Oversized calf**

Calving problems due to a relatively oversized calf are common in beef cattle.

When a large calf’s nose and feet are presented at the cow’s vulva, she may struggle to give birth on her own. With two people pulling and reasonable traction, it should be possible to extend the front legs so the fetlock is one hands breadth beyond the vulva, within ten minutes of traction.

Seek veterinary assistance if greater traction is required or no obvious progress is made. If the calf’s legs are crossed in the vagina or at the vulva, this can indicate that the shoulders are tight in the pelvis and veterinary assistance should definitely be sought.

If the number of oversized calves is high, or is increasing, feeding and management should be reviewed, as well as bull selection. Check the sire’s EBVs for calving ease, gestation length and birthweight. Try not to calve cows in BCS greater than 3.0. Restrict the breeding period to nine weeks in spring-calving herds, so there are no ‘stragglers’, which can get too fat on spring grass and calve when there is less supervision on hand.

**Breech (calf coming backwards)**

This another common reason for dystocia. Usually two feet are seen protruding from the vulva. It is important to confirm that these are indeed back legs (see above). It may require two strong people pulling on calving ropes slowly and steadily, or use of a calving aid to apply traction, to deliver the calf safely. If in doubt call for veterinary assistance, because if the calf gets stuck or is delivered too slowly, it may suffocate before it is born.

Possible complications from delivering a calf backwards are rib fracture and liver rupture. Prolonged delivery can also compress the chest and blood vessels including the umbilical cord, causing lack of oxygen to the brain.
Full breech

This is when only the calf’s pelvis and tail are presented, while the back feet are still within the uterus. The cow may not show signs of the second stage of labour such as straining, because the calf does not engage with the maternal pelvis. This means the problem can go undetected for a long period and the calf may die. Subsequently the cow may become very ill developing septicaemia or toxaemia.

After administering an epidural injection to block the contractions, a vet may be able to push the calf back inside. The hind feet need to be cupped and pulled towards the maternal pelvis and each joint extended in turn, before the calf is gently pulled out. There is a risk that the umbilical vessels may rupture whilst trying to bring the hind legs around. The uterine lining can also become damaged or even completely ruptured during the extraction of the calf.

Two calves coming together

If the cow is carrying twins they might try to be born together. In this case, it is necessary to identify which legs belong to which head. This can be done by tracing back along the head and down the shoulder of one twin. Put ropes on the correctly identified legs and once the other calf is pushed back inside, the first can be pulled out slowly. Only slight-moderate pressure should be required for delivering a twin, which will be smaller than a singleton.

In most calving cases it is easier to correct a malposition of the calf when the cow is standing as it can be pushed back or manipulated. Once the presentation is corrected, allowing the cow to lie down is fine, and is often the best position to deliver the calf, as the pelvis is at its maximum diameter.

Hip lock

This occurs when excessive traction has been applied to an oversized calf and the calf’s hips become lodged as they enter the cow’s pelvis. The cow will often be exhausted by this stage. Veterinary attention is essential at this point, as further traction, trying to roll the cow over or rotating the calf can cause nerve damage to the cow. If the calf has died it may have to be removed surgically.

Incomplete cervical dilation

Incomplete dilation of the cervix occurs occasionally in heifers, although the exact frequency is difficult to report, as it is often confused with early first stages of labour. Usually the opening remains no more than only 5-10cm in diameter and does not dilate over time.

Natural dilation is achieved by the contractions of the uterus pushing the intact water bag through the cervix into the vagina.

Manual pressure applied for 10-15 minutes may help dilate the cervix for animals in the early stages of first labour. In some heifers or cows the vulva may also fail to dilate, due to lack of pressure from the water bag. Veterinary attention may be required.

Human interference can disrupt the normal progression of labour. Ideally leave cows and heifers undisturbed for four hours after mucus/slime is first seen at the vulva, unless the animal is clearly having powerful contractions every five minutes or so.
Uterine inertia
This usually occurs with older beef cattle with subclinical or clinical hypocalcaemia, where labour fails to develop past the first stage.

When the cow is examined she is often fully dilated but the calf may be dead. The cow might show other signs of hypocalcaemia (difficulty standing and low body temperature) and if in the advanced stages she is likely to be down and showing the typical ‘swan neck’.

Treatment involves administration of calcium borogluconate, available in either 20% or 40% concentrations. It can be given by subcutaneous injection if detected early, or as a prevention in high risk animals. In advanced cases this may be ineffective and intravenous injection would be preferable.

In mild cases, once the hypocalcaemia is treated, it may be worth leaving the cow for a short time to allow the uterine tone to return and for her to progress naturally.

Uterine torsion
While this is a relatively common problem, the exact cause is not clear. Uterine torsion from 180° to 720° prevents the calf or fluids showing at the vulva. Often there are no signs of the first stages of labour. The cow may isolate herself but the cervix will not dilate.

Occasionally a cow will appear to start calving and then stop and return to relatively normal behaviour. On examination of the vagina, it is usually possible to feel a distinct twist, like a corkscrew. Urgent veterinary attention is needed.

It is often possible to manually correct the twist, but the uterus and cervix may be very fragile and it may be necessary to perform a caesarean to ensure delivery of a live calf and prevent injuring the cow. If left undetected, the cow usually becomes very sick due to the death of the calf and development of a severe uterine infection.

Uterine ruptures and vaginal tears
Tears during delivery can allow sub-mucosal fat to protrude or lead to a more serious ruptured artery or vein. The latter is life threatening and needs urgent veterinary attention.

Examine cows after any assisted calvings to check that there is not another calf and that there have been no vaginal tears or ruptures. Insert a clean, gloved and lubricated hand, feel for another calf, even after a large calf or twins. Then run a hand around the pelvic area to feel for tears, holes or any pulsing fluid which might indicate a tear. A ruptured vaginal or uterine artery or vein is life threatening and needs urgent veterinary attention.

This is more common when a calf has presented in the breech position. If left undetected, the cow can appear normal for a few hours, but then become very sick quickly, by which time treatment may be too late. The cow may die or have to be put down.
Calf care after calving

Immediately post-calving

A calf needs to breathe as soon as possible after it has been born. If the calf does not do so automatically, clear the mouth and nasal passages of fluids and mucus, then tickle inside the nostrils with a piece of straw. This should cause a reflex, which makes the calf snort or cough, thus expanding the lungs, allowing air to enter.

If there is a lot of mucus in the nose and airways it can help, if possible, to hang the calf up by its back legs briefly, to allow the fluid to flow out more easily.

The calf may pant after breathing is initiated, as this helps increase oxygen intake and carbon dioxide release. It is a good sign if a calf is sitting upright within 20 minutes of birth. It is then likely to stand and suckle and ingest colostrum. If the calf continues to pant for more than 20 minutes seek veterinary advice.

Colostrum

Once the calf is born it is vital that it suckles long enough to take in adequate colostrum. It is not safe to assume that a calf lying peacefully soon after birth has had a good feed of colostrum – it probably has not. If in doubt check it has a full stomach.

Calves that have had a stressful birth may need extra colostrum or electrolytes to improve their health status. Calves that have had difficult births, or that have not suckled should be helped to suckle or be hand-fed, with a calf stomach tube if necessary.

It is a good idea to have a supply of frozen colostrum on hand during the calving season. However this must be carefully warmed in warm water as the proteins in colostrum that transfer immunity can easily be destroyed by overheating. Do not use a microwave to warm colostrum.

Colostrum contains nutrients as well as antibodies, but needs to be consumed by the calf within six hours of birth for it to acquire satisfactory passive immunity. Calves require three litres or 10% of bodyweight of good quality colostrum (50g/L of immunoglobulin G, IgG) as soon as possible after birth and after six hours will require another similar size feed. This is equivalent to 20 minutes of suckling.

It is estimated that half of all calves born do not receive adequate colostrum. This is due to:

+ Delayed or insufficient intake
+ Poor/inexperienced mothers (heifers)
+ Pendulous udders and enlarged teats
+ Milk fever
+ Difficult calvings
+ Poor colostrum quality
+ Dilute colostrum from high yielding cows
+ Poor dry cow nutrition

Calves that do not receive enough colostrum are four times more likely to die, due to a lack of absorbed antibodies.
**Navel**

At birth the calf’s navel should be dipped in 10% tincture of iodine and this should be repeated two to four hours later, particularly where it has been licked excessively by its mother.

**Scours**

Segregate older calves from calves that are less than a week old. This reduces the risk of scour-causing pathogens transferring between the young animals.

**Pens**

Calves born indoors need to be in dry pens with plenty of airflow, but no draught. The air should be fresh and not stale and a human crouching at calf level should not feel any air movement.

Pens should be cleaned regularly. Try the ‘squelch test’. When jumping on the straw there should be a rustling sound. If there is a ‘squelch’, the pen needs mucking out.

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**Cow care after calving**

**Cleansing**

Cows should pass the placenta within 12-24 hours after calving. If it has not been passed in this time, treatment is needed to prevent infection.

**Nutrition**

Pay close attention to the diet of freshly calved cows. The nutrient demand of a newly calved cow is approximatively double that of a dry cow. It is important to supply plenty of energy and protein post-calving to maintain milk production and promote recovery after giving birth. The aim should be to avoid a negative energy balance post-calving. It is also important to provide fresh, clean water.

Heifers in particular, are likely to need supplementary feed, as they require energy for maintenance, growth and milk production.

**Post-natal checks**

To achieve a 365-day calving interval, cows have around 80 days before they need to conceive the next pregnancy.

During this period it is easy to focus entirely on managing the young calves and the cow’s breeding health can be forgotten. But successful calving next year, starts immediately after calving this year. To start conceiving again the cows must have clean reproductive organs and be cycling normally.

In a herd with a history of below-target re-breeding, it may be worth asking the vet to check cows are cycling and that they do not have an infection. This is particularly important for cows that have had difficult calvings. Such a check involves a manual inspection, which should take no longer than a regular Pregnancy Diagnosis (PD) test. With an estimated production cost of £450-800/cow/year depending on the system, getting one more cow back in calf will more than cover the examination cost.