EBLEX BEEF BRP MANUAL 8

Optimising suckler herd fertility for Better Returns
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EBLEX Beef Better Returns Programme is grateful to all those who have commented and contributed to this production.

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It costs between £450 and £800 to keep a suckler cow for a year, so it is essential she produces a viable calf every 365 days, to deliver an income which will cover this expenditure and produce a profit.

In a 100-cow herd, increasing the number of calves reared per 100 cows put to the bull by just 2% could increase calf sales by £800 to £1,000 per year.

Maintaining high conception rates and keeping the calving-to-conception interval short, are key. Tools such as recording and benchmarking performance, pregnancy diagnosis and Body Condition Scoring (BCS) can help producers increase cow output.

This manual explains how these tools can be used. For example it outlines the BCS targets for each stage of the production-cycle of autumn and spring calved cows. It also shows how appropriate feeding, breeding and health management can help.

We also look at the particular requirements of heifers as they approach their first calving. Finally we review the importance of the bull, for no matter how fertile the cow, if he is not in working order she will never get in-calf.
How fertility affects profitability

The profitability of a suckler herd is directly related to the number of calves reared per cow or heifer served annually.

The total cost of production for English suckler herds is around £450–£800 per cow per year, so it is vital that as many cows as possible produce a viable calf every 365 days. A cow that is not pregnant for more than 12 weeks is a drain on resources and not earning her keep.

In a 100-cow herd, increasing the number of calves reared per 100 cows put to the bull by just 2% could increase calf sales by £800–£1,000 per year. Relatively small improvements can make a significant difference to the bottom line.

There are two main ways to improve suckler cow fertility:

Increase conception rates

If 100 cows were put to the bull and achieved 60% conception in each oestrus period, then there would be, after:
- 3 weeks – 60 in calf
- 6 weeks – 84 in calf
- 9 weeks – 93 in calf
- 12 weeks – 97 in calf.

A conception rate of 60% leaves just 3 cows empty after 12 weeks with the bull. Lower conception rates lead to far more empty cows – see graph below.

Reduce the interval between calving and conception

Cows that give birth early in the calving season will tend to conceive more easily than cows calving later, as they have longer to recover before the next service period.

Calves born early in the season usually have heavier weaning weights which will increase their value and is another good reason for getting cows in calf as quickly as possible after calving.

Farm A has a much more compact calving period than Farm B. Consequently more calves are born earlier in the season and are 22kg heavier at weaning. This additional weight could amount to more than £2,900 for a 100-cow herd achieving 94% weaned calves per female served.

Top Tip: Calculate how many calves are born in each three week period from the start of calving to see how quickly cows conceive relative to each three week oestrus cycle.
Comparing records with national benchmarks also highlights the strengths and weaknesses of any system.

**Comparing performance against standard targets**

<table>
<thead>
<tr>
<th>Target Description</th>
<th>Target</th>
<th>Your performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barren cows</td>
<td>&lt;5%</td>
<td></td>
</tr>
<tr>
<td>Calves born per 100 cows/heifers put to the bull</td>
<td>&gt;95%</td>
<td></td>
</tr>
<tr>
<td>Calves weaned per 100 cows/heifers put to the bull</td>
<td>&gt;94%</td>
<td></td>
</tr>
<tr>
<td>Cows calving within first 3 week period</td>
<td>&gt;65%</td>
<td></td>
</tr>
<tr>
<td>Cows calving within first 9 week period</td>
<td>&gt;90%</td>
<td></td>
</tr>
<tr>
<td>Adult cows with difficult calvings</td>
<td>&lt;5%</td>
<td></td>
</tr>
<tr>
<td>Calf mortality – during pregnancy</td>
<td>&lt;2%</td>
<td></td>
</tr>
<tr>
<td>Calf mortality – birth to weaning</td>
<td>&lt;3%</td>
<td></td>
</tr>
<tr>
<td>Bulling period</td>
<td>9 weeks (cows) 6 weeks (heifers)</td>
<td></td>
</tr>
<tr>
<td>Calving period</td>
<td>12 weeks</td>
<td></td>
</tr>
<tr>
<td>Replacement rate</td>
<td>&lt;15%</td>
<td></td>
</tr>
</tbody>
</table>

(Based on Fertbench; SAC Suckler Herd Fertility benchmarking service)

Recording performance

Recording individual cow and calf performance is essential for managing fertility. It reveals the animals that are most fertile and most economic to keep and those that should be culled.

It is important to achieve good performance in all areas that impact on overall herd fertility.

For example, high first three-week calving percentages produce:

- Heavier calves at weaning
- Heavier and more fertile home-bred heifers at mating
- Reduced labour requirements, as calving takes place in one batch rather than spread over several months
- Less disease spread from older to younger calves.

**Herd notebook**

The best way to capture events such as calf births and cows served, is to carry a notebook and pen.

Use this information to:

- track individual cow and calf performance
- benchmark the herd against industry standards at the end of the year.
**Maintaining a compact calving period**

To achieve a tight calving season requires discipline at serving time, and only allowing bulls to run with the herd for a defined period of time – usually nine to ten weeks.

**Benefits**
- Simpler cow and calf management
- A more even batch of calves
- Increased weaning weights
- Reduced production costs
- Greater financial returns
- Less labour requirement at calving
- Fewer calf health problems.

**Don’t be tempted to leave the bull in too long**

Options for shortening the calving period:
- Taking the bull out after nine weeks with the cows – even earlier for the heifers
- Culling 5–10% of cows calving outside the target calving period
- Selling in-calf cows or those with calves at foot that fall outside the target calving period and retaining/purchasing more heifers
- Where there is more than one calving period, bring in replacements for one period only and allow the other to gradually disappear.

**Choosing a calving period**

Given the high feed requirement of lactating cows and youngstock, it makes sense to choose a calving period when good quality cheap feed is available. Often this means matching calving date to grass growth – whilst also considering availability of labour and facilities.

This also allows cows to mobilise excess body condition during the expensive winter feeding period when she is dry. It is far more economic to let the cow preserve the grass for winter as body condition, than making and feeding silage.

**Beware the empty cow!**

In a herd where there is more than one calving season or calving is all-year-round, it is easy for an infertile cow to slip from one calving season to another; extending her calving interval to beyond the desired 365 days. Keeping these less fertile cows is not cost effective, and culling should always be the choice.

**Top Tip:** Examine calving records or BCMS herd data to identify cows with extended calving intervals.
Reasons for poor fertility includes both bull and cow factors and may include:

- Heifer and cow body condition at bulling
- Difficult calvings (consider choice of bull and better management of body condition)
- Disease in heifers, cows and bulls
- Heifer rearing and management at bulling
- Bull fertility and health
- Long calving season.

Where are problems happening?

If the number of cows and heifers producing a live calf is a concern, categorise those females that fail to do so according to:

- Barren – never got in calf
- Aborted – conceived but did not hold
- Died
- Culled
- Sold.

Identify the reasons why problems might have occurred and plan with your vet how to avoid them in future.

Pregnancy diagnosis (PD)

It is vital to know that cows are safely in calf as soon as possible after the mating period by carrying out some kind of pregnancy diagnosis.

PD methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Who</th>
<th>Timing</th>
<th>Pros and cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual palpation</td>
<td>Vet</td>
<td>From 8 weeks (better if later but &lt; 5 months)</td>
<td>No need for electric supply but not good for accurate or early calving date prediction</td>
</tr>
<tr>
<td>Ultrasound scanning</td>
<td>Vet/technician</td>
<td>From 6 weeks</td>
<td>More accurate calving date prediction which is useful for identifying problems</td>
</tr>
<tr>
<td>Observation of heats</td>
<td>Farmer</td>
<td>Any time</td>
<td>Unreliable used alone but complementary to other techniques</td>
</tr>
</tbody>
</table>

Top Tip: Analysis of reasons why breeding animals are culled from the herd can indicate where problems exist. For example, if there are many barren first calvers, was this due to difficult calvings as a result of a particular sire, or insufficient feed energy post-calving?
Body Condition Score (BCS)

Body condition scoring is a key management tool when managing suckler cow and heifer fertility.

Suckler cows can lay down fat when feed is plentiful and mobilise it again when feed is expensive or in limited supply.

In an average 600kg suckler cow, one body condition score equates to 70kg of body weight. Better returns result from using low-cost grazing wherever possible, to increase body condition reserves and use body condition loss to ‘supplement’ expensive winter feed.

### Ideal Body Condition Score

- **Spring Calvers**
  - Calving in Spring
  - Service in Summer
  - Weaning in Early Winter
  - 6 weeks Pre Calving
  - Calving in Spring

- **Autumn Calvers**
  - Calving in Autumn
  - Service in Winter
  - Turnout in Spring
  - 6 weeks Pre Calving
  - Calving in Autumn

Spring calvers should be in good body condition in late autumn, allowing planned weight loss over winter. However, excessive weight loss should be avoided as this can delay the return to oestrus after calving and reduce colostrum quality. A delay in weaning at the start of winter can have similar consequences.

For autumn calvers, excessive body condition after summer grazing can lead to calving difficulties. Restrict the cow’s access to pasture or delay weaning if this is a problem.

Thin cows lack stamina to calve unaided and produce poor quality colostrum. Ideal body condition score is between 2 and 3, ie ‘fit not fat’. Fat cows run an increased risk of calving difficulties.
How to assess Body Condition Score

Cows should be handled at the tail-head and the loin area to assess body condition.

<table>
<thead>
<tr>
<th>BCS</th>
<th>0</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
<th>3.5</th>
<th>4</th>
<th>4.5</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emaciated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grossly over-fat</td>
</tr>
</tbody>
</table>

**BCS 2**

**Tail head**
Shallow cavity but pin bones prominent; some fat under skin

**Loin**
Horizontal processes can be identified individually with ends rounded

**BCS 3**

**Tail head**
Fat cover over whole area but pelvis can be felt with firm pressure

**Loin**
End of horizontal processes can only be felt with pressure; only slight depression in loin

**BCS 4**

**Tail head**
Completely filled with fat, folds and patches of fat evident, soft to touch

**Loin**
Cannot feel processes and has completely rounded appearance

When assessing BCS, grip the outer edges of the loin with the thumb curled under the ledge formed by the horizontal processes of the spine. The ball of the thumb is used to feel the thickness of fat over the bone.

The loin is scored by feeling the horizontal and vertical projections of the vertebrae and the amount of fat between them. The ribs are scored using the flat of the hand and finger-tips to feel the amount of fat over them.

Assessment should be carried out quietly and carefully using the same hand from cow to cow. An overall visual assessment is also important.

BCS is assessed on a scale of 0–5. Consistency is crucial. Do not confuse assessment of animal condition with conformation.
The cow production calendar

Cow management, nutrition and body condition score impact on fertility and performance throughout the year, not just during the breeding season.

Wean early if cows/heifers are in poor body condition or if feed supplies are short, eg drought. Increase body condition gradually during this period for spring calvers.

- Spring calving: BCS 3–3.5
- Autumn calving: BCS 2.5

Cows should be at target BCS for calving six weeks before giving birth. Avoid changes to BCS within six weeks of calving.

- Spring calving: BCS 2.5–3
- Autumn calving: BCS 3
Thin cows will struggle to conceive. Aim to increase BCS from calving to six weeks after conception to encourage bulling activity, implantation of the embryo and reduce early losses.

Spring calving  BCS 2.5–3
Autumn calving  BCS 3

Avoid any loss of BCS during mating and for six weeks after end of service period.

Service period starts six weeks after calving. Cows need to be back in calf 12 weeks (80 days) after calving.

The average gestation length for commonly used terminal sires is 280–290 days, leaving only 80 days for the uterus to recover after calving, and the cow to start cycling again and become pregnant.

Achieving a 365-day calving interval depends on a cow being in good body condition and fit and healthy after calving.
Feeding to improve cow fertility

The hormones which control fertility and nutrition are closely linked. Under normal conditions dietary energy is the main factor limiting the reproductive performance of suckler cows.

The most critical time for cow nutrition is from six weeks before calving through to six weeks after service.

The best practical way of judging whether cows are being fed appropriately is by scoring them for body condition (see pages 6–7).

Correct body condition will minimise calving difficulties and minimise the period after the birth when cows are not cycling.

Spring calving cows should calve at BCS 2.5 and then gain body condition towards mating. Autumn calvers should calve at BCS 3 and maintain this score through mating and six weeks beyond. This will ensure egg viability and maximise embryo survival. Minimize negative energy balance in early lactation by providing high quality feeds to promote ovulation.

Weaning the suckled calf

Once the calf is 200 days old, 75% of its nutrient requirement should come from feeds other than milk.

Time of weaning provides a useful means of manipulating body condition score.

With spring calvers, be prepared to wean calves from six months of age to protect body condition for later mobilisation when low-cost feed is less available.

In autumn calved herds, delaying weaning until ten months of age can avoid cows putting on excess condition in mid to late pregnancy. Alternatively, calves can be weaned earlier and feed supply to the cow controlled.

At weaning check the condition of all cows and heifers and group according to BCS and feed accordingly. If space for separate groups is limited, keep heifers, first calvers and thin cows separately from the main herd to ensure they continue to grow and reach target liveweight for the subsequent breeding season.

Essential micro-nutrients for fertility

Copper, selenium, iodine and vitamin E are essential for optimising suckler cow fertility. Blood testing some cows may be useful to identify any deficiencies, in consultation with the vet.

EBLEX Beef BRP manual 5 – Feeding suckler cows and calves for Better Returns has more information. Email brp@eblex.org.uk or call 0870 241 8829 to request a copy.
Breeding to improve cow fertility

The genetic traits that influence reproduction tend to have low heritability, so genetic progress through selective breeding takes a long time.

There are some Estimated Breeding Values (EBVs) that can be used to enhance reproductive rate, particularly within purebred herds.

<table>
<thead>
<tr>
<th>EBV</th>
<th>Impact of sire with superior EBVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first calving</td>
<td>Heifers that are reproductively active at an early age</td>
</tr>
<tr>
<td>Scrotal circumference</td>
<td>Directly attributable to the bulls’ daughters fertility and the age they reach puberty</td>
</tr>
<tr>
<td>Calving Interval</td>
<td>Cows with short calving intervals</td>
</tr>
<tr>
<td>Longevity</td>
<td>Cows that will have a long herd life, in part due to improved fertility</td>
</tr>
</tbody>
</table>

Remember that breeding strategies to produce female replacements must take into account a range of traits including growth rate, milking ability, temperament and ease of calving.

**Capitalising on Hybrid Vigour**

Reproductive traits are greatly enhanced by crossbreeding due to hybrid vigour. Trial work in the USA shows the massive impact that crossbreeding strategies can have on productivity.

**Hybrid vigour advantage in crossbred cows**

- 10% increase in conception rate
- 10% improvement in calving ease
- 7.5% increase in number of calves raised to weaning
- 5–10% increase in milk yield.

The exploitation of the right crossbreeding strategy can increase the weight of calf weaned per cow mated by up to 15%–23%, depending on crossbreeding system.

To maximise hybrid vigour the crossbred cow should be crossed to a sire of a third breed (neither of the breeds in the cow).
Avoid difficult calvings

Calvings that require assistance greatly increase the risk of reproductive problems in the following breeding season, and also reduce calf survival.

There are three main causes of calving difficulties:

- Calves too big (due to excessive dam nutrition or poor sire choice)
- Dams poorly grown (caused by poor management of maiden heifers)
- Dams over-fat (due to a loss of control over body condition)

Choose sires with:

- Low birth weight EBVs
- Short gestation length EBVs
- Good EBVs for direct calving ease

Calving the cow

Only intervene when a calving is not proceeding normally.

Uterine infections, eg endometritis (whites) can significantly delay the onset of cycling after calving, so it is important to practice good hygiene if a cow has to be examined while she is in labour.

Always wear full length AI gloves and use lubrication to assist the smooth passage of the live calf. Disinfect any calving equipment between each calving.

Reduce stocking density in calving yards and replace bedding before each cow calves.

Avoid difficult calvings through breeding

EBVs can be used to select bulls that will reduce the incidence of calving problems.

Nutrition

Good management of cow nutrition using the Body Condition Scoring (BCS) system throughout the year can reduce problem calvings considerably. Similarly, ensuring that maiden heifers are well grown at service, and subsequently fed well enough to allow them and their calves to continue growing, will encourage easier calvings. First calvers are also still growing to their mature size as well as being pregnant so will also need preferential feeding where possible.

Do not feed excessively in late pregnancy as this will increase the birth weight of the unborn calf, leading to calving difficulties without improving the body condition of the cow.
Health issues affecting fertility

Most health problems will affect fertility; some more severely than others.

All abortions and stillbirths should be reported and investigated by a vet. Keep the cow isolated. Possible causes include infectious bovine rhinotracheitis (IBR), bovine virus diarrhoea (BVD), leptospirosis, neosporosis, salmonella and venereal campylobacter.

While Johne’s disease does not cause abortions, infected cows suffer weight loss and are hard to get back into calf.

Good general herd health is vital to optimise fertility.

Discuss with your vet:

- A herd health plan
- Vaccination policies
- Preventative treatments against internal and external parasites
- Replacement policy
- Quarantine procedures for purchased stock.

An aborted foetus at 3–4 months.

Progressive weight loss and chronic diarrhoea are the main signs of Johne’s disease.
Managing maiden heifers

Heifers bred to calve at two years old have more calves in their lifetime and are more profitable than heifers calved for the first time at three years old, if managed well.

When selecting heifer replacements the heaviest and earliest born are most likely to reach puberty and get into calf at an early age.

First-bred heifers are often served when they are below their mature weight, so they must be fed for growth and maintenance requirements as well as pregnancy. Similarly, first calvers have yet to reach their mature weight and need to be fed sufficiently well to grow and maintain their pregnancy. This is often best achieved if they are grouped separately to avoid competition from mature cows.

Liveweight targets for replacement heifers

<table>
<thead>
<tr>
<th>Stage of life</th>
<th>Target Liveweight relative to mature weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first service</td>
<td>65% e.g. 425kg at 15 months (650kg mature wt)</td>
</tr>
<tr>
<td>At start of 2nd breeding season</td>
<td>85%</td>
</tr>
<tr>
<td>At start of 3rd breeding season</td>
<td>95%</td>
</tr>
</tbody>
</table>

First calvers can take up to 30 days longer to resume cycling after calving than mature cows. It can be helpful to serve them for only the first six weeks of the service period. This ensures that only fertile heifers that conceive quickly will join the herd and gives them the longest time possible to recover after calving before the next breeding season starts.

Target liveweights for replacement heifers from birth to mature weight of 600kg
Breeding options

Whilst natural service using a stock bull has many advantages in the suckler herd, artificial insemination (AI) is also worth considering.

AI technology is now commonly used in dairy and pedigree beef herds enabling producers to hand pick the bulls used on each female. For a relatively small cost, producers can purchase semen from high genetic merit sires, speeding up the rate of genetic progress in their herd. It also avoids the need to have both terminal and maternal stock bulls for herds breeding their own replacements.

The tables below outline some of the advantages and disadvantages of AI and synchronisation. Synchronisation is a means of encouraging a batch of females to come bulling together so they can all be served at the same time. It is commonly used for females being AI’d, as it enables inseminations to be carried out over a condensed time period.

In both cases attention to detail is critical to achieve success.

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synchronisation</strong></td>
<td></td>
</tr>
<tr>
<td>Minimise labour requirement at AI and calving</td>
<td>Additional cost</td>
</tr>
<tr>
<td>Avoids need for heat detection if using fixed time insemination</td>
<td>Need to handle stock several times</td>
</tr>
<tr>
<td>Facilitates AI thus giving access to high genetic merit sires</td>
<td>Can require 20% more heifers to be mated if only given two opportunities to conceive to AI</td>
</tr>
<tr>
<td><strong>Artificial Insemination</strong></td>
<td></td>
</tr>
<tr>
<td>Access to top quality, high accuracy genetics without huge investment in a bull</td>
<td>Heat detection required unless cows are synchronised. Without synchronisation, requires time spent observing natural heats ideally 20 mins three x daily</td>
</tr>
<tr>
<td>Avoids year round cost of keeping a bull</td>
<td>Conception depends on competent technician, and are typically 60%</td>
</tr>
<tr>
<td>Wide choice of bulls</td>
<td>Additional labour and handling facilities are required</td>
</tr>
<tr>
<td>Bulls can be selected that are specifically suitable for heifers</td>
<td>Cow/heifer temperament is important</td>
</tr>
<tr>
<td>Reliable semen quality</td>
<td></td>
</tr>
<tr>
<td>Avoids disease threats of buying in stock from outside the herd</td>
<td></td>
</tr>
</tbody>
</table>
Bull fertility

Bull fertility is key to maintaining a compact calving period, maximising the value of the calf crop and overall herd profitability.

Whilst few bulls are infertile (i.e. incapable of getting a cow in calf), many are sub-fertile (produce fewer calves than a fully fertile bull).

Consider a breeding soundness examination to test semen quality, and physical soundness before the breeding season to identify sub- or infertile bulls.

Ensuring the bulls in the herd are ready for work requires forward planning, as semen production takes 60 days. The bull must be in good health and ready to work at least ten weeks before the breeding season begins.

Preparation for work

- MOT you bull ten weeks before you want him to work. Check his body condition (ideally BCS 3), and his testicles by palpating – they should feel firm and free of lumps, softness or swelling. His penis and sheath should be free of sores, cuts, scars, growths, abscesses and warts. Check his overall health
- Quarantine new bulls for four weeks after purchase for health screening and ration acclimatisation
- Avoid sudden ration changes and do not over-feed as this can reduce fertility and lead to feet problems
- Check feet and legs well in advance of serving time, as good locomotion is essential for getting cows pregnant. Take remedial action if required
- Provide exercise where possible (e.g. site feed and water at opposite ends of the field).
Whilst at work

- Watch the bull working to check he is serving cows effectively
- Rotate bulls or PD early so that an infertile or sub-fertile bull can be identified early. Even bulls that have passed a breeding soundness examination can go lame or suffer reduced fertility during the breeding season
- Record when you see a cow being mated and watch for signs of cows coming on heat repeatedly
- Don’t over work a young bull.
Other BRP publications available

**Beef BRP**
- Manual 1 – Choosing Bulls to Breed for Better Returns
- Manual 2 – Marketing Prime Beef Cattle for Better Returns
- Manual 3 – Improving Cattle Handling for Better Returns
- Manual 4 – Beef Production from the Dairy Herd
- Manual 5 – Feeding Suckler Cows and Calves for Better Returns
- Manual 6 – Improve Beef Housing for Better Returns
- Manual 7 – Feeding Growing and Finishing Cattle for Better Returns
- Manual 8 – Optimising Suckler Herd Fertility for Better Returns
- Manual 9 – Controlling Worms and Liver Fluke in Cattle for Better Returns
- Manual 10 – Better Returns from Pure Dairy-bred Male Calves

**Joint Beef and Sheep BRP**
- Manual 1 – Improving Pasture for Better Returns
- Manual 2 – Improved Costings for Better Returns
- Manual 3 – Improving Soils for Better Returns
- Manual 4 – Managing Clover for Better Returns
- Manual 5 – Making Grass Silage for Better Returns
- Manual 6 – Using Brassicas for Better Returns
- Manual 7 – Managing Nutrients for Better Returns
- Manual 8 – Planning Grazing Strategies for Better Returns
- Manual 9 – Minimising Carcase Losses for Better Returns

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