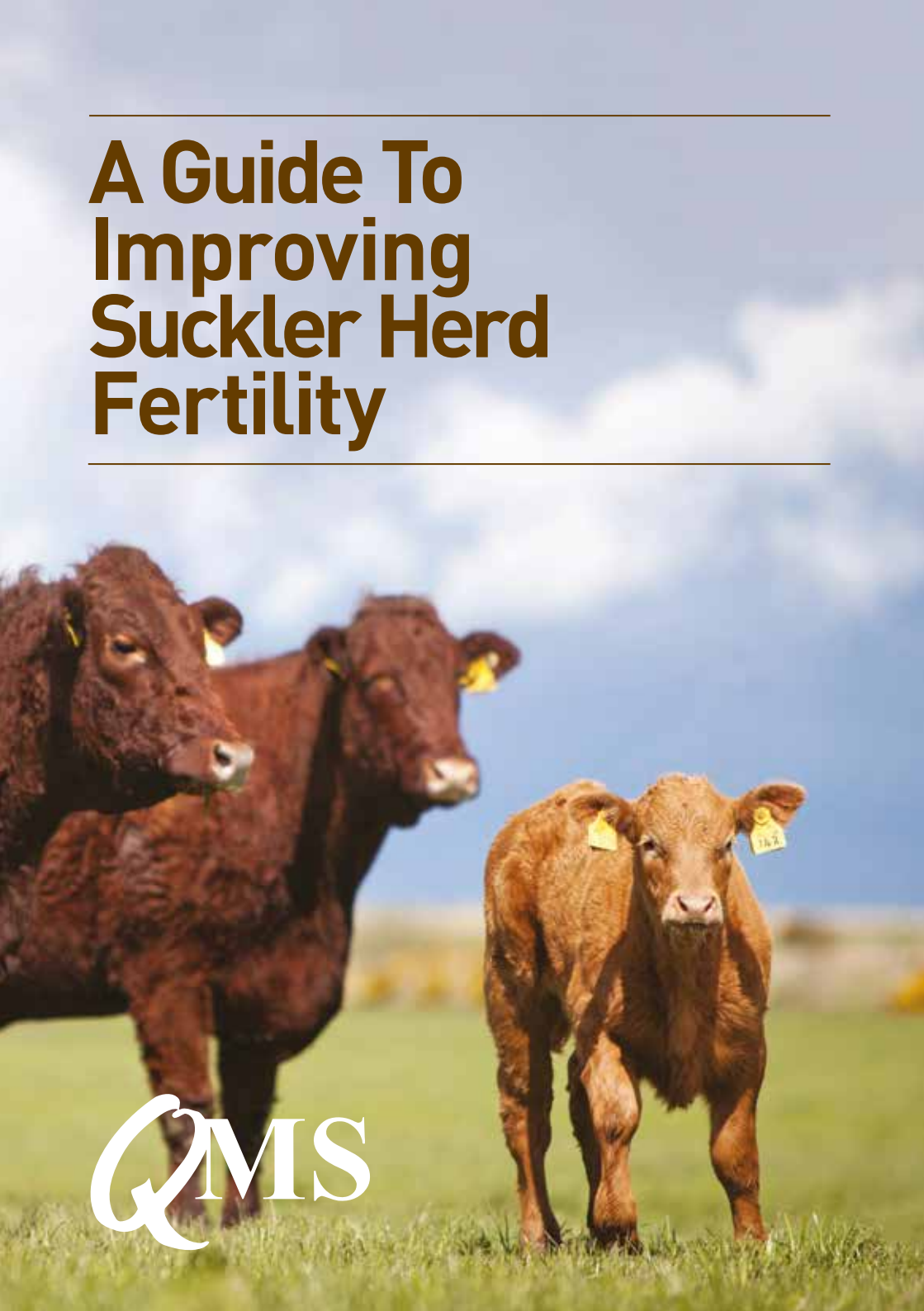
A Guide To Improving Suckler Herd Fertility



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Introduction

Suckler herd fertility

Managing and improving the fertility of your suckler herd is one of the key ways to improve cow margins and hence business profitability.

This booklet is designed to help you assess your herd's fertility and identify scope for improvement, and provides ideas you can put into practice on your farm.

Achieving optimum performance from your beef enterprise has never been more important. So challenge yourself to improve productivity by improving your herd's fertility – it is likely to improve the bottom line.

Section 1: Importance of fertility

Background to the importance of suckler herd fertility

1.1 Targets for suckler herd fertility

Industry-accepted targets for suckler herd fertility are shown below. These have been developed by SAC Consulting and are based on international data, research reviews and results from top-performing herds.

The targets:

- Calvings per cow and heifer put to the bull – 95%
- Barren cows – no more than 5%
- Cows calving in first three weeks – 65%
- Cows calving in six weeks – 90%
- Bulling periods – nine weeks for cows and six weeks for heifers
- Calf mortality birth to weaning – less than 3%
- Calves reared – 94% (calves reared to cows and heifers bulled)
- Replacement rate – less than 15%

Although these targets may appear ambitious, they are achievable by adopting the management practices described in this booklet. It can be beneficial to set interim targets for your own herd and to review performance before progressing towards the ultimate industry targets, shown above.

The financial benefit accrued from increasing numbers of calves reared and achieving a compact calving are substantial and are a significant contributor to top financial performance.

Table 1 highlights the variation in performance between the top and poorer performing herds.

- The average herd rears an extra four calves and the top third an extra seven calves compared to the bottom third
- The bottom third, average and top third herd is losing out on eleven, seven and four calves respectively when compared to our fertility target of 94% calves reared per 100 cows and heifers to the bull
- Many herds are already achieving 94% calves reared and the aim of this booklet is to provide guidance that will allow you to match this level of performance
- Valuing calves at £550, average performers could produce another seven weaned calves worth an additional £3,850 per year and the bottom third an additional 11 calves worth £6,050 per year

1.2 Fertility results for Scottish suckler herds

QMS figures for the average Scottish suckler herd show that only 87 calves are weaned for every 100 cows and heifers put to the bull. This is seven calves below target performance which could have contributed to the profitability of the business. There is a wide range of performance from those in the top third to those in the bottom third. Table 1 shows the percentage calves reared per 100 cows and heifers to the bull for upland and lowland herds over three years of QMS surveys, and highlights the variation in performance between top and bottom performing herds.

Table 1 – QMS survey averages for calves reared per 100 cows/heifers to the bull

	Calves reared per 100 cows/heifers to bull		
	Bottom 1/3	Average	Top 1/3
Calves reared per 100 cows and heifers to bull	83	87	91
Extra calves if reach 94% target	11	7	3
Extra calves value if reach 94% target	£7,425	£4,725	£2,025

*Source – Cattle and Sheep Enterprise Profitability in Scotland – 2014, 2015 and 2016. Aggregated data for non LFA, LFA selling weaned calves and LFA selling yearling calves.

*Assumption – calf value of £675 at weaning, based on weight of 300 kg and price of £2.25/kg.

The Bottom Third, average and Top Third herd is losing out on eleven, seven and three calves respectively when compared to target fertility levels of 94% calves reared per 100 cows and heifers to the bull.

Many herds are already achieving 94% calves reared, and the aim of this booklet is to provide guidance that will allow you to match this level of performance.

Valuing calves at £675, average performers could produce another seven weaned calves worth an additional £4,725 per year and the bottom third an additional 11 calves worth an extra £7,425 per year – a substantial extra contribution to herd output.

1.3 Improving calf value at weaning through compact calving

Getting cows in calf is only a rough indicator of herd fertility. A more accurate measure of fertility also includes the number that conceive over a short bulling period to achieve a tighter calving pattern.

Although more calves may be reared by extending the mating period in any one year, this is likely to lead to the retention of less fertile cows, meaning the problem of lower conception rates is spread over a longer period. Some cows will not have calved by the time mating starts. These factors can only result in more complicated herd management and increased labour requirements.

Table 2 demonstrates that herds with a short calving period wean calves that are on average older and heavier, with the best herd weaning calves at 299kg, i.e. 25kg heavier than the moderate herd and 47kg heavier than the poor herd.

Table 2 – The performance impact of an extended calving pattern

			Calving spreads		
	Assumed age at weaning (days)	Assumed weight at weaning (kg)	Calving pattern % best	Calving pattern % moderate	Calving pattern % poor
First three weeks	230	309	68	35	13
Second three weeks	209	285	21	20	15
Third three weeks	188	261	11	20	16
Fourth three weeks	167	236	0	18	38
Fifth three weeks	146	212	0	5	14
Sixth three weeks	125	188	0	2	4
Average weaning age days			220	199	180
Average weaning weight (kg)			299	274	252
Weaning value at £2.25/kg			£673	£617	£567
Difference from best (£/hd)				-£56	-£106

*Source – real herd data from Scotland's Animal Health Planning System (SAHPS) for spring-calving herds with variable calving patterns.

*Assumption – weaning at eight months from the start of the calving period, with a birthweight of 45kg and an average daily liveweight gain of 1.15kg/day.

In practice, the herd with the poor calving pattern may delay weaning for some of the smaller calves, but this lost growth will result in lighter calves at store sales or extra days to finish cattle, thus reducing beef herd profitability.

Assuming that these calves are being sold store at weaning for £2.25/kg, the farm with the best calving pattern will make £56 more for every calf it sells compared to the moderate calving pattern – this translates to £5,264 if the target 94 calves weaned per 100 cows to the bull in the herd is achieved.

A compact calving pattern pays, and there is a big financial incentive to improve this aspect of performance.

The advantages of a short calving period

Labour
- Less time supervising extended calvings
- Fewer late-calving cows reduces risk of more difficult calvings due to overfit cows/heifers
- Bigger batches of calves

Nutrition
- Easier and more accurate rationing as stock at similar stages of growth, pregnancy and lactation

Disease
- Reduced risk of disease spread from older to more vulnerable younger calves

Herd fertility
- More cows coming into season when the bull is turned out

Weaning weight
- Calves born earlier are heavier at weaning than later-born calves
- A smaller weaning check in bigger calves

Marketing
- More even batches of store cattle
- Finishing cattle sold earlier, with fewer tail-end calves

Replacement heifers
- A greater number of earlier-born calves increases the pool of heifer calves at suitable weight and maturity for bulling to calve at two years of age

1.4 The value of combining fertility and compact calving

The financial benefit accrued from increasing numbers of calves reared and achieving a compact calving is substantial.

Table 3 shows that an average herd, rearing 87% calves with a moderate calving spread, could gain an additional £44 a cow or £4,400 per year for a 100-cow herd, by rearing an extra seven calves. Rearing the extra seven calves and achieving a compact calving period, as shown in the third column of Table 3, could improve income by

£96/cow or £9,600 for the 100-cow herd.

Table 3 – The effect of rearing percentage

	Rear 87% calves Moderate calving pattern	Rear 94% calves Moderate calving pattern	Rear 94% calves Compact calving pattern
Calves reared %	87	94	94
Ave weight per calf weaned (kg)	274	274	299
Ave calf wt weaned per cow/heifer (kg)	238	258	281
Average price (p/kg)	225	225	225
Output per cow (£)	536	580	632
Change in output (£)		44	96
Change per 100 cow herd (£)		4,400	9,600

Note: Compact calving is achieving the target set on Page 5, with 90% of cows calving in a six-week period.

1.5 Understanding the reproductive cycle

Cows undergo a period of physiological recovery after calving before fertility resumes, i.e. coming into bulling. The uterus recovers from being stretched by a calf, the membranes and protective fluids. This takes around 40 days for cows, slightly longer for heifers, and is likely to take substantially longer if there were calving difficulties or uterine infections. The target is to ensure that most cows are bulling by 50 days after calving.

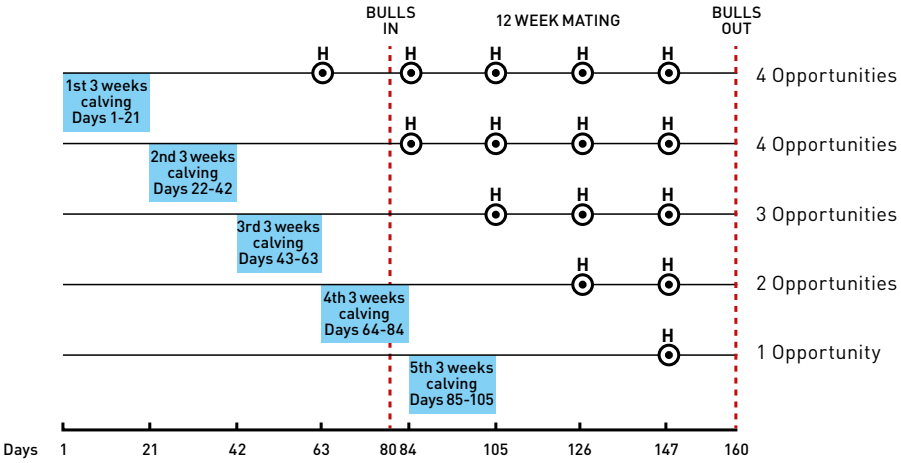
Causes of delayed return to oestrus and poorer herd fertility are:

- Calving difficulties
- Poor body condition at calving
- Poor nutrition, e.g. late grass growth
- Size – underestimating the maintenance requirement of larger cows
- Underestimating the nutritional requirements of first (and second) calvers which are still growing

Graph 1 below shows the number of heats (H) and mating opportunities for cows calving at different times in the calving period, over a 12-week mating period. The chart is based on the assumption that cows in condition score 2.5 should have their first fertile heat 50 days post-calving. Those calving in the first six weeks may have four opportunities to be mated, while those calving at the end of the 15th week might have only one proper mating opportunity, which is likely to reduce the pregnancy rate.

The graph illustrates the benefits of compact calving, which allows cows more recovery time and more mating opportunities, within a defined bulling period.

Graph 1 – Mating opportunities for cows calving at different times of the calving period



Case study 1

Good fertility is achievable – Rob, Kath and Iain Livesey, The Firth, Lilliesleaf, Borders

Borders farmers Rob, Kath and son Iain Livesey run a herd of 90 pure-bred Salers cows. From 2014 to 2016, no more than one cow each year has not been in calf. Cows run with the bull for nine to ten weeks while the heifers get six weeks. They regularly achieve 60–70% cows calving in the first three weeks of the calving period, and over 90% inside six weeks. In 2016, cows calving to the first turn (three weeks) were 65%, second turn was 32%.

So how did they do it? Much is down to good management, but this is helped by having a maternal cow type, in their case Salers. The cows' fertility, calving ease and milkiness is impressive. Other maternal breeds achieve similar results. The key maternal characteristics are good fertility, early sexual maturity, good fleshing ability, milkiness, longevity and easy calving. Calf growth rates of 1.1kg/day are achieved with minimal creep feed, as the calves have an ability to gain condition at grass.

Compact calving allows a large proportion of heifers to achieve target bulling weight of over 400kg at 14–15 months old.

The Liveseys get great satisfaction from running their herd, which demands little hands-on management. The cows pretty much look after themselves and having a compact calving allows even batches of stores to be marketed, simplifying management.

Each year seven to eight bulls are bred for sale, but with demand increasing more may be kept entire. Steers are sold at approximately 540kg at 17 months, while heifers are either retained for the herd or sold privately. Demand for breeding heifers is also dramatically increasing.

Case study 2

Achieving a compact calving period – Alex and Ross King, Wolfstar, East Lothian

Alex and Ross King run 150 late spring calving suckler cows and 40 pedigree Simmentals on areas of permanent pasture on their mainly arable unit at Wolfstar, Ormiston, East Lothian.

The beef herd is managed to fit in with arable work, having a tight nine-week bulling period leading to an equally compact calving in late April/May/June. Cows are crosses of Simmental and Aberdeen Angus, with Simmental and Aberdeen Angus bulls crisscrossed to provide replacements. Surplus heifers are sold for breeding, and steers are finished at 13-14 months of age on an ad lib concentrate diet.

What are the secrets of their success?

- Use of breeds with good maternal characteristics
- Selection of bulls for growth rate and muscle but also for maternal traits
- Selecting heaviest heifers for breeding at turnout, with a 10-month target weight of 380kg and a target gain of 0.9kg/day in first winter
- Heifers weigh 450kg at bulling, hitting the target of 65% of mature cow weight
- Hybrid vigour – Ross comments that fertility improved on moving away from 7/8 and 15/16 crosses
- Management of cow condition – grouping according to condition or age, and control of diets to avoid overfit or over thin cows from weaning to calving
- Preferential treatment of first calvers – housed along with leaner cows to provide an opportunity to grow and maintain condition
- Bull MOTs – all bulls examined and semen tested each year reducing the risk of a sub-fertile bull wrecking the calving pattern
- Culling problem animals – no second chances for cows that fail to carry a calf.
- Herd health monitoring through a CHeCS (Cattle Health Certification Standards) scheme and buying in stock based on herd health records
- Outdoor calving in May and June (weather permitting) – whereby physically fitter cows calve more easily, with less risk of disease spread from calf to calf. Only heifers are calved indoors

This is a classic example of good heifer selection and management leading to a compact heifer calving pattern, with tight cow and bull management maintaining the calving pattern year on year.

Section 2: Calculating fertility

2.1 Benchmarking herd fertility

Benchmarking fertility in your herd against interim herd targets set by yourself, against industry targets or with other similar herds, can identify strengths and weaknesses in your production system. Please refer to page 3 for industry targets.

Benchmarking, however, is only of use if action is taken on the findings.

Getting together in groups of like-minded producers with broadly similar systems, comparing results and discussing changes will drive your business and the industry forward.

Funded by the Scottish Government, SAC Consulting developed Scotland's Animal Health Planning System (SAHPS) – this includes online Suckler Herd Health and

Fertility Benchmarking, to allow comparisons and identification of areas for improvement. The programme uses information that is readily available to herd managers and provides clear reports that can be used by farmers, their vets or consultants.

The following information is required:

- Number of animals to the bull
- Date bulls in and date bulls out, or first and last AI date
- Calving dates from the calving book
- Records of deaths

Genetic and management information such as dam, sire, calving ease and temperament can also be a valuable source of data recorded in your calving book and also captured as part of the Scottish Beef Efficiency Scheme (BES).

For further information please go to about BES please visit **www.ruralpayments.org**.

2.2 Comparing and interpreting results

A considerable range of performance is illustrated in the farm examples in Table 4.

Table 4 – Calving results, selected from SAHPS

Farm	Target	A	B	C	D
% calves reared	94%	91%	77%	94%	86%
% cows calving	95%	96%	81%	97%	82%
% cows barren	<5%	4%	18%	3%	14%
% cows/heifers calving in first three weeks	65%	51%	16%	79%	57%
Length of calving (weeks)	10	13	30	11	13
% calves born alive	95%	91%	83%	94%	88%
% total calf deaths inc stillborn	3%	9%	6%	3%	3%

- Farm A reared 91% calves per cow and heifer to the bull born over a period of 13 weeks. However, only half of them calved in first three weeks. All of the losses were stillborn. Could difficult calvings have caused the problem? The manager of this herd should consider investigating sire EBVs and cow nutrition
- Calves on Farm A will be considerably heavier at weaning than those from Farm B, which has a protracted calving pattern. Farm A will also have a larger selection of heifers to choose from when calving at two years of age
- Farm B has a low number of calves reared and a prolonged calving period.
- Farm C has achieved a high number of cows calving, calves reared and cows calving in the first three weeks. The target rearing percentage of 94% has been achieved
- Farm D (like farm B) has a problem with barren cows (14%). Barren cows' records should be assessed for age (older cows, or younger cows struggling to grow, rear a calf and maintain body condition), whether they required assistance at their last calving, when they calved in the last calving period (late-calved cows have less chance to recover and hold to the bull at mating) and approximate condition score at their last calving

Case study 3

Reviewing suckler herd fertility – James and John Thomson, Hilton of Beath, Fife

James and John Thomson run 175 spring-calving and 100 backend-calving cows on their 1,450 acre beef and arable unit at Hilton of Beath, Kelty, Fife.

A review of their herd's performance and production system by a specialist beef consultant revealed that James and John were managing their herd well and producing well-conformed calves. The recommendations were to fine-tune the system rather than make any big changes. Calves reared were running close to the QMS average at 86%, and there was potential to increase this by reducing calf losses. The majority of the losses were calves born dead or dying within two days of birth, which would normally be related to difficult calvings.

The bull EBVs were checked for calving ease and these were all satisfactory. However, the cows were fitter than desirable in mid-winter, with their prospects of slimming down before calving reduced by the feeding of an ad lib silage diet fed through ring feeders. This is a common issue in spring-calving herds.

Recommendation – calculate the weekly dietary requirements and reduce the energy content of the diet by alternating feeds of bales of straw with bales of silage.

Result – cows calved in leaner condition with fewer difficult calvings, leading to a higher percentage of calves reared.

James and John commented: "We found the review to be of value, and it was very useful to have a fresh pair of eyes look at our system. We changed the way we fed our spring calvers and found calving a lot easier than in the previous few years."

Section 3: Improving herd fertility

3.1 The five key principles to improve herd fertility

The five main areas for improving fertility in a herd are through:

1) Management of bulling heifers.
2) Targeting cow condition throughout the year.
3) Avoiding difficult calvings.
4) Bulls – selection, soundness and fertility.
5) Maintaining a satisfactory herd health status.

3.2 Management of bulling heifers

Correct management of bulling heifers is key to achieving excellent herd fertility.

Key points

- Ensure that heifers reach target weights for bulling
- Sexual maturity is related to weight rather than age
- Heifers born earlier in the calving period are likely to be heavier at bulling and genetically more fertile
- Heifers selected for maternal characteristics tend to be more fertile
- Early maturing breeds reach sexual maturity at lower weights than late maturing breeds
- A restricted heifer mating period will lead to compact calving as cows
- Give preferential treatment to first and second calvers, especially when calving at two years old

Selecting replacement heifers

Breeding or selecting replacement heifers is the most important decision you will make, as they provide half of their calves' genetics and their management will have a big influence on fertility.

Breed replacement heifers from bulls with good maternal EBVs. The EBVs are available from either ABRI Breedplan or Signet Beefbreeder. EBVs can be checked via breed society websites.

Table 5 opposite identifies maternal traits measured by each of the two systems.

Table 5 – Key maternal EBVs and terminology used

	Beefbreeder (SIGNET)	BreedPlan (ABRI)
Calving ease	√ Maternal calving ease	√ Calving ease daughters
200 day milk	√	√
Age at first calving	√	
Scrotal size	√	√
Fertility	√ 'calving interval'	√ 'days to calving'
Size		√ 'mature cow weight'
Longevity	√	

Reference SAC Technical Note TN641: Utilising Maternal Trait EBVs of Beef Bulls – funded by QMS

Target weights for bulling heifers

Providing heifers have reached target bulling weight and are healthy, they should be ready to breed successfully. Heifers that fail to hold to the bull after a six-week mating period are less fertile than their herdmates and are more likely to slip further in future breeding seasons, so should not be retained in the herd.

Target mating weights are 65% of mature weight for bulling heifers, 85% for the second mating and 95% by the third. If heifers are below target weight at first bulling, a greater number should be put to the bull so that the appropriate target number of replacements required is reached.

Regular weighing of replacement heifers helps to ensure heifers are meeting target growth rate of 0.8kg/head/day for the heifer to be bulled at 390kg and 0.9kg/day for the one being bulled at 455kg. Mature weight is reached at around five to six years of age.

Cattle weights are often under-estimated by eye, so it is important to weigh cows and growing heifers destined for breeding. Checking cull cow weights at sale also gives a rough guide of mature cow weights. See examples in Table 6.

Table 6– Heifer mating targets relative to mature cow weights

	Targets as % of mature weight		
Mature cow weight (kg)	First mating	Second mating	Third mating
	65%	85%	95%
600	390	510	570
700	455	595	665

Heifers may struggle to hold to the bull after first or second calving unless they are managed separately. They have higher energy demands due to the need to produce milk to raise a calf, get back into calf, continue to grow and maintain body condition.

- Heifers need to grow at an average liveweight gain of 0.80–1.0kg/day from birth, to hit targets for calving at two years of age. The bigger the mature weight, the higher the gain needed to first bulling
- First and second calvers, which calved around two years of age, need preferential treatment – both at grass and when housed – if they are to hit bulling weight targets
- Most herds can calve heifers at two years of age unless under harsh environmental conditions
- Cost of maintaining heifers to calve at three rather than two can be 50% higher
- The cow is programmed to look after its calf as its first priority, and will sacrifice its own body condition – lean cows often become barren cows

Heifer breeding guidelines

Natural service

- Use an easy calving bull (a bull with good calving ease EBVs)
- Bull for a six-week period

AI

- Two turns of AI
- Synchronisation can help tighten up the heifer calving particularly for herds breeding replacements at two years of age
- Sexed semen can be used to produce smaller heifer calves to reduce the risk of bad calvings

If first calvers are treated preferentially, they will start bulling as soon as the older cows. Replacements, whether calving at around two years of age or older, should be bulled at the same time as the rest of the herd. Tight heifer mating leads to a compact calving pattern for the rest of their herd life.

3.3 Managing cow condition and nutrition

Key points:

- Poor body condition is one of the major causes of poor fertility
- Manage cows to achieve target body condition scores at calving
- Manage to prevent weight loss from calving to conception through ensuring adequate nutrition including at grazing
- Give thin cows and first calvers preferential treatment
- Big cows need more feed
- Outwintered cows may have a higher energy/protein requirement
- Review rations and forage quality each year, as every year forage quality may be different
- Mineral deficiencies are an unusual cause of infertility, but specific supplementation may be required in certain situations
- Health issues, e.g. liver fluke and Johne's disease, can have a detrimental effect on cows' condition

Condition scoring is a method of evaluating body fat reserves in animals by assessing the level of subcutaneous fat just below the hide of the animal. See section 4 on how to condition score.

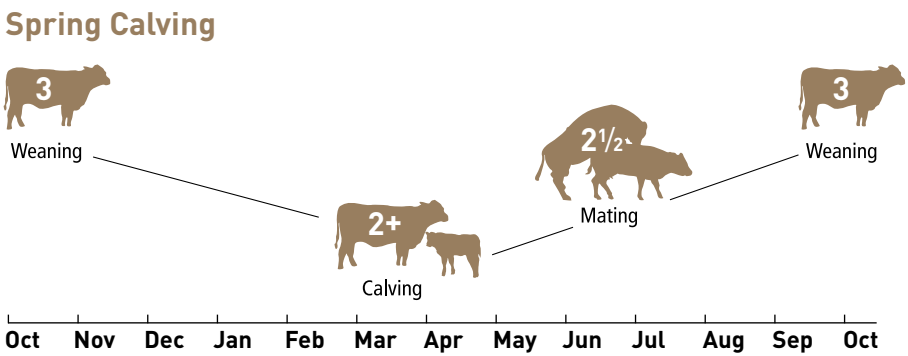
Body fat reserves are important because:

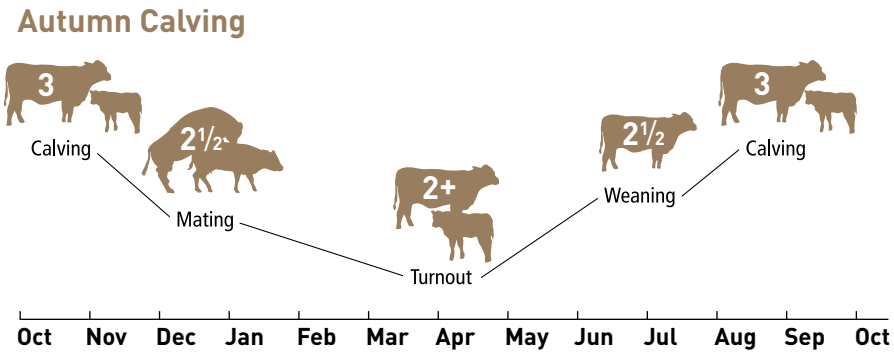
- They are the main energy reserves of the body that the cow can use to maintain her production with lower feed intakes. Losing one unit of condition (e.g. from a score of three in the autumn to two in the spring) provides a 750kg cow with the same energy as one tonne of silage or a quarter tonne of barley. Utilising cow condition over the winter allows feed levels to be reduced, cutting expensive feed costs
- As cows become fatter they have more difficulty calving, increasing the risk of caesareans or even calf mortality
- Cows with very low levels of body fat reserves can lack energy at calving. They are also more at risk of being slow to (or stop) coming into season and be barren unless fed well to improve their condition

Cow condition must be managed on a year-round basis to achieve target condition scores. It is important to handle some cows to get your "eye in". Thereafter, assessing cow condition by eye alone will be adequate to split cows into groups, e.g. fat, target and thin groups, and decide if rations need to be adjusted.

Target condition scores at calving are 2+ and 3 for spring and autumn-calving cows respectively. See the charts below.

Graph 2 – Condition scores for spring calving cows





Graph 3 – Condition scores for autumn calving cows

Using nutrition to adjust cow condition

Nutrition is key to managing cow condition throughout the production cycle. Use forage energy and protein values, together with cow requirements (based on their weight and condition score), to work out forage allocations and supplementary feed requirements. Cows do not require to be fed the same forage diet every day, and feeds can be alternated. For example, dry spring calvers fed silage may need to be fed straw to restrict energy intake. This can be achieved by calculating the cows' daily requirement, assessing the quantities of silage and straw required per week, and alternating silage and straw to provide the weekly requirement.

Where straw is expensive, the alternative is to delay weaning (saving creep feed) and to force the cow to lose condition. The protein content of silage can be highly variable between cuts and years, and feed straw is also low in protein. It is vital to assess silage quality in advance of wintering and to ensure appropriate levels of protein are fed.

Requirement for minerals and trace elements

A mineral and vitamin supplement may not be required when cows are grazing, apart from supplying extra magnesium to avoid tetany. However, in some geographical areas there are known deficiencies of specific trace elements (e.g. cobalt, selenium, copper and iodine), and these should be addressed, for example, by giving the cows a bolus containing the appropriate trace element(s).

Consult with your vet to assess whether supplementation is required. Unnecessary supplementation is costly and can have a detrimental effect on the health and fertility of the herd.

Winter rations should always contain a mineral and vitamin supplement to cover any possible deficiencies. In particular, straw-based rations require supplementation with selenium and vitamin E.

The supplement can be sprinkled on or mixed with silage or mixed into the concentrate but must be uniformly applied along the trough so that all cows get their share. Special attention should be given to the supply of iodine, copper and selenium where cows are out-wintered on diets containing brassicas.

Using a nutritionist or beef consultant to plan winter diets for cows can help make best use of available forage in years of tight supply and minimise the number of over-fit animals if forage quality is good. Group animals according to condition score and feed accordingly, e.g. divide spring calvers into fit, target, and lean groups after weaning. First-calved heifers should either be housed separately or with the lean group.

3.4 Avoiding difficult calvings

Difficult calvings increase calf losses, reduce fertility and cost money.

Key Points:

- Over-fat cows are slow to calve and have more difficult calvings than cows calving at the target condition score. Fatter cows have more fat around the birth canal, increasing calving difficulty. Late summer and autumn-calving cows should be grazed tightly to control condition and avoid calving difficulty
- Use EBVs to select bulls with low calf birth weight, short gestation length and good calving ease direct traits. Long gestation normally leads to increased birth weight, which increases the risk of difficult calvings. Use of EBVs and good management practices can help minimise the number of difficult calvings
- If breeding homebred replacements, check maternal calving ease figures for bulls being used to breed replacements, as these EBVs indicate how easily a bull's daughters will calve

Some farmers, falsely, believe that you have to accept a number of difficult calvings, and even caesareans, to rear quality calves with good growth rate and conformation.

Difficult calvings are one of the main reasons for poor fertility, as they:

- Result in reduced colostrum intake
- Substantially increase the risk of the calf dying in the first week of life
- Reduce the number of calves available for sale
- Increase the stress level of the producer
- Reduce the likelihood of the cow getting back into calf quickly

3.5 Bull selection, soundness and fertility

Bull selection

Many producers buy a bull on looks alone. While this does provide useful information about his scale, length, correctness, soundness and condition, judging by eye cannot provide critical information on how his calves are likely to perform, such as:

- How easily will they be born?
- How fast will they grow?
- Will they be lean or fat?
- How milky will his daughters be?
- How fertile his daughters will be?

These characteristics are determined by his genetics, and the tools to measure this have long been available in the form of Estimated Breeding Values (EBVs). Please refer to the QMS booklet "A Guide to Bull Selection and Management" for more detailed information. Download a copy from **www.qmscotland.co.uk** or order a hard copy by contacting QMS on 0131 472 4040.

Bull soundness and fertility

Key points:

- Bulls must be able to maintain body condition, repeatedly mount and serve cows in oestrus, have a good libido and produce fertile semen for a nine-week (or longer) breeding season
- Bull selection must focus on the appropriate EBVs plus scrotal circumference, feet, legs, etc. to allow successful mating
- More than one fifth of all working bulls are sub-fertile or infertile
- Annual pre-breeding checks allow sub-fertile bulls to be identified and excluded from the bull stud
- Mature bulls that have passed a breeding soundness examination can run with 50 cows for nine weeks and achieve the 95% conception target. The number of cows run to the bull may be limited by field size, and the norm of 30–40 per bulling group can be safely increased where bulls have passed examination and a larger bulling group is a practical option
- Bulls should have a long, productive, working life. Overfeeding young bulls pre-sale is likely to reduce working life

To achieve performance targets, bulls must get more than 95% of females they are run with pregnant within nine weeks, and at least 65% of those in the first three weeks of the breeding season. However, studies from around the world have consistently shown that more than a quarter of bulls have defects that will prevent them reaching desired performance levels.

A survey of bull breeding soundness examination in the south-east of Scotland found that only two thirds of bulls were judged to have characteristics that would lead to acceptable levels of fertility. Reference: A survey of breeding soundness evaluations in the south-east of Scotland (Eppink, Cattle Practice (2005) 13:205).

Annual pre-breeding examinations carried out by your vet will identify the sub-fertile bulls. Vets can use electro-ejaculation to collect a reliable semen sample. This is an easy way to identify both sub-fertile bulls and potential high performers, and the bulling group size is then adjusted accordingly.

A veterinary assessment of libido and ability to mount and serve properly requires a cow in oestrus to be restrained and bulls observed mating. Alternatively, stockmen can carefully observe that bulls are showing libido and mating properly in the first week of bulling. Vets can instruct how this observation should be carried out.

Table 7 – Bull examination timetable

Two to three months before mating	Check that all bulls are physically sound and any feet that require attention are treated
One month before mating	Bull soundness examination carried out by your vet
First few days of breeding	Bulls observed carefully to ensure they are mating properly
21 days after bulls turned out with cows	Check cows for returns

Traditionally, many farmers run bulls in mating groups of around 30 cows and rotate bulls after three weeks to cover for sub-fertile and infertile bulls. This underutilises bull power, leaving the sub-fertile bull unidentified, and is unnecessary if their fertility has been checked. As a secondary check, observe cow bulling activity and any potential returns to service.

These measures minimise the need to handle bulls that can be dangerous.

3.6 Maintaining herd health

Infectious disease can reduce bull and cow fertility, increase abortions and impact on calf mortality and growth rate.

Key points

- Several infectious diseases can impact on productivity year after year, but BVD, leptospirosis, venereal campylobacter infection and Johne's disease are the most important diseases. These diseases can reduce bull fertility and the ability of the cow to conceive. They also increase the losses through death or damage of the developing calf, leading to abortions, stillbirths, and damaged calves that are more likely to die in the first few weeks of life. Johne's disease significantly increases the replacement rate
- Infectious disease can cause numerous problems – including poor conception rates, increased abortions and stillbirths, increased calf mortality and increased wastage of breeding animals
- Carrier animals which appear healthy are the most common way of introducing these infections to the herd
- Effective biosecurity systems can keep these diseases out of your herd and prevent the re-introduction of infection once you have eradicated them
- Herd health planning highlights the risks for your herd and provides a programme to manage these risks
- Purchase animals on the basis of health status, giving preference to those from accredited herds
- Infected animals should be culled rather than sold to others for breeding

Be aware of the risks

With BVD, leptospirosis and venereal infections, the ongoing annual cost of these diseases can be £2,000 to £5,000 per year. However, in the first year where herds experience a BVD or campylobacter outbreak then the losses can be spectacular, with some as high as £20,000 per year.
Purchase of infected carrier animals is the most common way that these infections arrive in the herd.

A risk table for these diseases and replacement strategies is shown in Table 8.

Table 8 – Risk assessment guidelines for common replacement policies in relation to BVD, leptospirosis, Campylobacter and Johne's disease

Common replacement policies	Level of risk that each policy holds for each disease			
	BVD	Leptospirosis	Campylobacter	Johne's disease
Purchase virgin bulling heifers from accredited herds	Negligible	Negligible	Negligible	Negligible
Purchase virgin bulling heifers from herds of unknown status	Moderate	Moderate	Negligible	Moderate
Purchase in-calf heifers from herds of unknown status	Moderate to high	Moderate	Moderate	Moderate
Purchase of cows with calves at foot	Moderate to high	Moderate	Moderate	Moderate
Purchase young bulls that have not mated from accredited herds	Negligible	Negligible	Negligible	Negligible
Purchase, hire or share bulls that have been used in other herds	Moderate	Moderate	High	Moderate
Buy calf to set-on (calf finished and not retained for breeding)	High	Low	Negligible	Negligible

Health accreditation programmes allow the sale of assured breeding replacements. These are standardised programmes, and the operators are licensed by Cattle Health Certification Standards (CHeCS). Individual animals may also be screened immediately before purchase or when in isolation after purchase. The BVD eradication scheme in Scotland gives purchasers the opportunity to source stock which are not BVD-virus carriers and are not likely to give birth to persistently infected calves. Many markets will promote the status at point of sale, and information is also available from ScotEid. Vaccines can also help to control and to minimise the impact of the disease should it be introduced.

Case study 4

Reducing the need for assisted calvings – Douglas Stewart, The Fans, Earlston

Douglas and his father Graham have a herd of 400 commercially run pure Angus cows and heifers. They have made a real effort to reduce the impact of difficult calvings over the last few years, with the result that over the last five years (2012– 2016) only 3.2% (approximately 13) of the cows have needed assistance at calving. For heifers calving at two years, the average has been 14.8% assistance over the same time period.

In 2016, the vet was not required for any calving and the Stewarts had no extremely difficult calvings.

Bull selection is based on purchasing bulls from regular vendors, being aware of their performance and breeding, and taking into account the required EBVs of calving ease, milk and growth.

The Stewarts keep records of all difficult calvings to help with cow management and bull selection decisions. Table 9 below is an example of the simple assisted calving record kept.

Table 9 – Example calving record

Cow/heifer number	Date	Calving jack	Vet	Reason	Sire
270	29/03/16	Yes	No	Heifer stopped pushing	Orvin

Table 10 – Calving results for 2016

	Vet assists		Stockman assists	
	Number	%	Number	%
Cows	0	0	9	2.8%
Heifers	0	0	13	16%

Table 10 above shows the calving results at Fans from 2016. In 2016, the vet was not required at any point for 400 females and was only needed for one caesarian on a heifer in 2015.

Calving assistance from the stockman on cows is minimal at 2.8%, although slightly higher at 16% for the heifers. Heifers calve at two years, and Douglas feels that in some cases assistance should be kept to a minimum to minimise stress on the heifer.

This reduction in assisted calvings has had a marked effect on fertility, with barren cows dropping from an average of 12% (2001–2003) to 6% in 2015.

The ten-year average for barren cows is 7.8% based on the bulls being in for eight to nine weeks for both cows and heifers.

Fertility is well proven, with 72.8% calving in the first cycle (target 65%) followed by 20% and 7% for the next two turns.

Success is based on many factors including selection of bulls, use of EBVs, semen testing, health status and most importantly good management.

Case study 5

Pre-breeding soundness checks – Graeme Richardson, Thrums Veterinary Group, Kirriemuir

A Pre-Breeding Soundness (PBS) check for bulls has become a regular feature on many farms. Ideally performed a month or two before the breeding season begins, the examination is intended to identify bull problems that might otherwise go undetected until pregnancy diagnosis or even calving time. In recent years, as farms have eradicated diseases such as BVD, and managed nutrition and parasitic problems better, the relative incidence of bull-related productivity problems has increased.

Generally, Graeme finds that around one in every five bulls tested is sub-fertile, but his sample contains a high proportion of suspect bulls. For farms testing all bulls annually the sub-fertile rate drops to one in seven.

A PBS examination involves:

1. Checking the bull's general health (but not his health status, with regard to BVD, IBR, Johne's Disease etc.).
2. An examination of both external and internal genitalia.
3. Collecting and evaluating a semen sample.

Semen may be collected with the aid of an artificial vagina and an oestrus cow, or by electro-ejaculation. The latter technique does not allow for assessment of a bull's libido or confirm his ability to serve but is quicker, easier, safer and more predictable, which has allowed Thrums Veterinary Group to offer a cost-effective service to farmers.

Some farmers test all bulls every year (recommended) whilst others test only bulls that are either new, ageing or have aroused suspicion.

It is rare to find a bull that is totally infertile, and more common to identify those that are sub-fertile. The subfertility may be due to testicular size, sperm quality or locomotion problems, but the end results are the same: a reduction in conception rate leading to more empty cows and a more protracted calving period. It is important to remember that even tested bulls can underperform if they contract an infection, become lame or have a libido problem, and monitoring groups of cows for returns to service remains useful.

As the use of PBS checks increases, often prompted by a bad experience, Graeme has seen a definite improvement in herd fertility and profitability. As well as identifying sub-fertile bulls, it helps to highlight bulls with exceptional potential, which can be useful when allocating bulls to differing sized groups of cows. Some bulls achieve excellent results with up to 55 cows.

At Mains of Balmadies, Forfar, annual PBS checks have helped identify sub-fertile bulls, giving owner James Osborne and stockman Gordon Smith the information to make alternative bulling arrangements and to ensure a compact calving.

Calving over 250 cows and heifers every spring in a 10-week period, the herd consistently achieves 60% of the cows calving to the first turn of the bull. This helps with management and calf health, and ensures even, well-grown calves when it comes to marketing.

Section 4: How and when to condition score

Body condition scoring is an invaluable technique in managing cow wintering costs, calving ease and subsequent fertility. It should be noted that condition can change rapidly, reflecting nutritional energy demands, potential health issues and general management. Monitoring cow condition prevents problems arising.

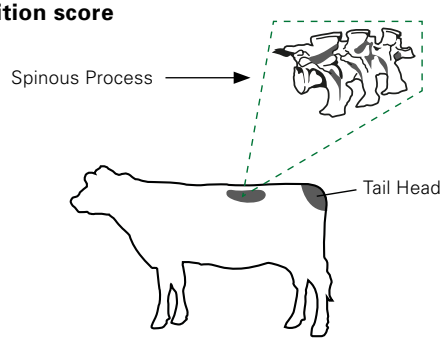
Condition scoring is based on a five-point scale (Table 11).

Table 11 – Condition score, description and potential consequences

Condition Score		Expected Performance
0	Emaciated and near to death	0
1	Very lean	Infertile or downer cow if pregnant
2	Commercial working range	
3		
4	Very fat	Infertile or extreme calving difficulty
5	Excessively fat and near to death from heart/kidney failure	

The normal "working" range for beef cows is between a condition score of 2 – 3½ .

How to condition score



Cows are scored by handling the animal on the left side over the loin area. In this area, three bones stick out sideways either side of the backbone. The score of the animal is decided on how easily the ends of these bones can be felt.

The key reference point is condition score 3, where the ends of these spinal processes can only just be identified even with firm pressure. The condition around the tail head can be used as a visual indicator, but it is the last area where fat is laid down, and the first area from which fat is mobilised.

- Well-conformed cows may look in better condition than they actually are
- Body condition score change over time can be as important as the score itself

A video on condition scoring is available – see the QMS website

When to condition score

Key timings for condition scoring for all herds are listed in Table 12.

Table 12 – When to condition score

When to condition score	Why	Action
Autumn/housing	**All herds** To assess how much condition cows can lose over the winter	• Group cows on their condition • Adjust rations accordingly i.e. more to lean group, less to fat group
Mid winter (January)	**Spring calvers** To check cows are on course to achieve target condition score at calving **Autumn calvers** To assess how much condition can be lost post mating	• Regroup cows if necessary • Adjust rations if required
Turnout	**Spring calvers** To maximise fertility **Autumn calvers** To ensure target calving score achieved in the autumn	• Put leanest cows on best pastures • Consider weaning leanest autumn calvers at turnout
Weaning	**Autumn calvers** To ensure target calving score achieved	• Group cows on condition • Tighten grazing or house very fat cows

Section 5: Checklist for improving suckler herd fertility

Review results for previous calving season to identify areas for improvement

- Compare your results with other herds in the QMS survey or other databases
- Consider asking your consultant or vet to assist with this review
- Review reasons for cows failing to conceive or calve e.g. barren cows
- Review causes of calf deaths

Management of bulling heifers

- Breed replacement heifers from bulls with good maternal EBVs – check these figures on the ABRI Breedplan or Signet Beefbreeder websites
- Ensure that heifers reach target weights for bulling – minimum 65% of mature weight
- Use an easy-calving bull on heifers with a positive calving ease direct EBV
- Aim for a compact heifer mating with a target of six weeks or two turns of AI
- Consider synchronisation to tighten up heifer mating
- Manage heifers and first calvers in separate groups from the main herd, and provide preferential treatment for grazing and winter feeding

Managing cow condition and nutrition

- Manage cows to achieve correct body condition score throughout the production cycle, particularly for calving, mating and weaning
- Calve in correct condition and prevent weight loss until conception has been confirmed
- Handle a number of cows in the crush and use the five-point scale to assess condition score – thereafter you can judge condition score by eye
- Divide cows into overfit, satisfactory and lean groups at weaning/housing and ration accordingly
- Feed thin spring calvers well after weaning to regain condition score and reduce the risk of over-thin cows
- Analyse forages and feeds, and have winter diets calculated
- Check that you are feeding the correct mineral and vitamin supplements
- Manage pasture and cow/heifer groups to ensure that cows are in correct condition score at grazing – particularly to avoid overfit autumn-calving cows

- Manipulate cow condition by adjusting weaning time – earlier to improve cow condition and later to reduce cow condition
- Discuss health planning with your vet to avoid loss of condition due to health issues, e.g. liver fluke policy

Reducing assisted calvings

- Manage cow condition score to avoid having overfit cows at calving
- Select bulls with low calf birth weight, shorter gestation length and good calving ease direct EBVs
- Keep a simple record of the need for calving assistance in your calving book
- Review this record to identify number of assists and vet interventions and assess whether this is linked to particular bulls or cow condition
- Review diets and feeding systems if you have overfit cows at calving

Bull selection, soundness and fertility

- Select bulls on both looks (scale, length, correctness, soundness and condition) and EBVs
- Consider whether you are selecting a terminal sire, a bull for breeding replacement heifers or a bull for use on heifers – and check the relevant EBVs
- After-sales service – speak to the breeder and ensure a gradual transition from pre-sale diet to your farm diet
- Check bull soundness two to three months before mating
- Bull soundness examination by vet one to two months before mating, including general health, examination of genitalia and collecting and evaluating a semen sample
- Observe that bulls are mating properly in the first few days of breeding and continue to monitor bulling activity

Maintaining herd health

- Prepare a herd health plan with your vet to minimise the risk of infectious diseases causing herd fertility problems or calf deaths
- Purchase animals on the basis of health status, giving preference to those from accredited herds
- Ensure that you have effective biosecurity systems to keep diseases out of your herd, e.g. quarantine procedures and separation from neighbouring herds
- Investigate all cases of abortion
- Investigate the causes of stillborn calves or calf deaths by arranging a post-mortem examination with your vet

Notes

Notes

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