

Improving lamb survival



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The information in this booklet was compiled by AHDB and Dr Liz Genever, independent sheep and beef consultant.

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Introduction

Improving animal performance and increasing lamb survival are key to ensuring sheep farming is profitable.

Producers are often surprised to find out just how many lambs they lose. This is partly because many are not visualised as dead animals because either they die inside the ewe or are aborted as foetuses.

Infectious abortions continue to account for a significant percentage of losses on lowland farms. Weather is also a significant factor, as it will impact ewe condition leading up to lambing and affect lambs at birth.

Improving lamb survival takes into account various factors, including the sheep farming system, ewe body condition, nutrition, health planning and management. The target should be to optimise scanning percentage, i.e. the number of embryos created and minimise lamb losses to the point of sale.

The first step is to review and analyse farm records to understand what is happening now. Comparing scanning, lambing and rearing percentages between years and with national benchmarks, will highlight where problems occur and indicate where action is needed.

When do losses occur?



Record the reasons, not just the numbers

Recording lamb losses may be disheartening, but can provide useful information about health status and management, especially if the cause of death is noted.

The AHDB **Flock notebook**, being pocket size, is ideal for writing down any key events while on farm. For a free copy, email publications@ahdb.org.uk or call 0247 799 0069.

An example of a lamb losses record sheet can be found on page 27. You can use a wall chart, blackboard, flock notebook or EID.

It may not be possible to record the reason for every individual death, particularly in outdoor lambing flocks. However, dead lambs can be separated by probable causes, counted and recorded as a batch, e.g. two laid on, three small lambs or one big single.

Almost a third of lamb losses are ‘invisible’, occurring between scanning and lambing. The majority of lamb deaths happen within 48 hours of birth, with lower numbers lost in the weeks immediately after.

Lamb mortality is wasted money

Lambs that die in the neonatal period cost more than it may initially appear. It is calculated to be about £20–25 per lamb up to the point of lambing.

This is based on a flock that scanned at 185%, with an annual replacement cost of £14 per ewe and a ram cost per lamb scanned of £1.35. The flock used abortion and clostridial vaccines, fluke and trace element treatments. The ewes lambed indoors with straw bedding and were offered hay and concentrates.

It pays to target lamb mortality, as money is being spent to produce animals for the dead lamb bin. So, can you afford not to monitor and investigate lamb mortality?

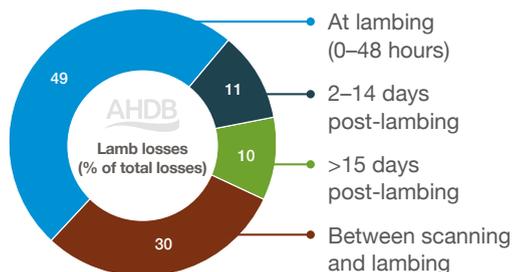


Figure 1. When lamb losses occur (% of total losses)

Source: HCC Lambing project 2010/11

Why do losses occur?

Recording events at and around lambing offers clues to why losses are happening. Five key measures will indicate where the problems lie.

- A Empty ewes at scanning** – number of empty ewes at scanning / the total number of ewes/ewe lambs put to the tup x 100
- B Lambs scanned** – calculated from the results of pregnancy scanning. Scanning percentage = (number of lambs scanned/number of ewes put to the tup) x 100
- C Lambing percentage (lambs born alive)** – when compared with lambs scanned, this indicates how many lambs have been lost during pregnancy through absorption or abortion. When compared with the number of lambs born dead, it can highlight health problems such as underlying infectious abortion or nutritional deficiencies
- D Lambs turned out** – when compared with lambs born, shows how many lambs are lost during the first few days of life. A fall in numbers could indicate underlying health problems, hygiene issues or problems with colostrum intake
- E Rearing percentage** – comparing rearing percentage, or lambs weaned/sold, to lambs turned out gives an indication of mortality during the lambs' first few months. These are more likely to be related to health problems, such as inadequate control of worms and infectious diseases. Rearing percentage = (number of lambs reared/number of ewes put to the tup) x 100

Where ewes give birth outdoors, lambing percentage and lambs turned out may be replaced by a figure for lambs tailed. This is generally done after lambing, but is still an important measure. The target for tailing could be based on the lambs turned out figure.

The key performance indicators in Table 1 can be used to your compare performance with previous years. They can also be used as part of a flock health plan. The KPI calculator can calculate these percentages for you. The calculator is available at ahdb.org.uk/tools

Table 1. Industry targets for lamb losses

Key Performance Indicator (KPI)	Industry Target
% empty ewes at scanning (A)	<2%
Lamb losses from scanning to birth (B-C)	<5%
Lamb losses from birth to turnout (C-D)	<5%
Lamb losses from turnout to weaning (D-E)	<3%
Lamb losses from scanning to rearing (B-E)	<13%

Choice of production system

Indoor lambing



Pros

- Protects the sheep and staff from the weather at this stressful time
- Gives pasture a chance to recover/grow
- Increased supervision

Cons

- Higher cost as more labour required, which has to be justified by higher output
- Increased risk of infectious disease
- Risk of mis-mothering

Best practice

- Employ one experienced lamber for every 250 ewes
 - Keep group pens freshly bedded (clean and dry)
 - Offer adequate lying area in each pen. For a 60–90 kg ewe: 1.2–1.4 m² during pregnancy and 2.0–2.2 m² with lambs (reduce by 10% for shorn sheep)
 - Allow one individual pen for a maximum of eight to ten ewes
 - Spread dry disinfectant or lime before re-bedding individual pens between ewes. Ensure walls and floors are also treated
 - Provide small group pens for ewes to mother-up – especially important for weak and fostered lambs
 - Provide one adopter pen and one isolation pen per 50 ewes
 - Supply adequate fresh, clean water for ewes – they can drink 7–10 litres a day when lambed
 - Organise lambing equipment well in advance, including spare colostrum supplies and lamb warming box
 - Employ good hygiene standards – treat navels, use disposable gloves and wash hands regularly
 - Provide hot and cold water for lambers
 - Ensure enough power points are available
- If housing is limited, give priority to older ewes, first crop ewes, ewes expecting multiple lambs and ewes with below target body condition score (BCS).

Outdoor lambing



Pros

- Can reduce feed and labour costs
- Less interference for the ewes
- Reduced risk of infectious disease

Cons

- Can be more difficult to collect data and tag at birth
- Less supervision and more difficult to foster, if required
- Higher losses may occur, especially if weather is poor

Best practice

- Employ one experienced lamber for 600–1,000 ewes
- Select sheltered fields
- Manage grazing to ensure pasture is available to freshly lambed ewes. Aim for 6 cm sward height or a cover of 1,800 kg DM/ha to avoid mis-mothering and abandonment
- Some individual pens should be available for any problems
- Supply adequate fresh clean water
- Organise lambing equipment well in advance, including spare colostrum supplies and lamb warming box

- Employ good hygiene standards if assisting ewes – use disposable gloves and wash hands regularly

Consult the vet to discuss any issues throughout the production year but especially at lambing. Often, early intervention helps save ewes and lambs.

Match sheep to the system

Ewes

Outdoor lambing ensures a strong selection pressure for ewes able to lamb with little intervention.

Reducing the labour requirement should also be a goal for producers lambing indoors.

Identifying ewes for poor mothering behaviour or problems, such as low colostrum yield, will help cull undesirable traits out of the flock.

When breeding replacements, either for indoor or outdoor lambing systems, maternal traits are extremely important.

Give each ewe and female lamb a lambing score. Using this system to cull poor mothers and select replacements can significantly improve the flock's maternal ability in future years.

Table 2. How to score ewes for material traits

Score	-1	0	+1
Lambing ease	Assisted	Minor help	No assistance
Mothering ability	Leaves lambs	Stands well back	Follows whatever
Lamb vigour	Needs help to suck	Slow to suck	Up and sucks

Ram

Different rams will produce different types of lambs in terms of their 'get-up-and-go' at birth. Purchase or select sires for ability to lamb without assistance. Rams that were born without help are more likely to produce offspring that do not need help at lambing.

Table 3. Time to stand and suckle

	Typical lowland breed	Easier management goal
Time to stand (minutes)	50	25
Time to suck successfully (minutes)	100	30

The faster a lamb is up and sucking, the less need there will be for human intervention.

If breeding ram lambs, use lambing scores to assess which to keep for breeding. Castrate any with a negative score.

Estimated Breeding Values (EBVs) for lamb vigour, lambing ease and birth weight are available for certain breeds. They can be used to select rams to produce ewes that are more likely to lamb without any assistance.



Improving output potential

There are non-infectious issues to consider before lambing which can improve ewe and lamb survival.

Body condition

Management of body condition is the driver for every sheep enterprise. Ensuring ewes are on target at various stages of the production year makes certain they are fit and robust, which will help reduce lamb losses.

Stress can increase losses, especially during early and mid-pregnancy, so handle ewes quietly. Prolonged cold weather or limited grazing can also stress ewes at this critical time and cause embryo death.

Table 4. Body condition score (BCS) targets

	Hill ewes	Upland ewes	Lowland ewes
At weaning	2	2	2.5
At tupping	2.5	3	3.5
Mid-pregnancy	2.5	3	3.5
At lambing	2	2.5	3

Nutrition

The size of the lamb, either too big or too small, can be the reason for a loss. This problem can be reduced through careful feeding pre-lambing.

Use BCS and the results of scanning at around 70 days to group ewes into similar batches. Pay special attention to ewes with triplets, which require supplementary feeding sooner than those carrying twins or singles.

It is essential to analyse winter forages and ensure rations are balanced to stop problems arising. Aim for a tight lambing period so more ewes will have a similar feed requirement at the same time.

Overfeeding concentrates adds cost, reduces forage intake and can cause acidosis, which damages the rumen lining.

Underfeeding pregnant ewes can lead to them giving birth to light or sickly lambs. It can also reduce their milk yield, reducing lamb growth rates and increasing the risk of mastitis, as hungry lambs can cause teat and udder damage.

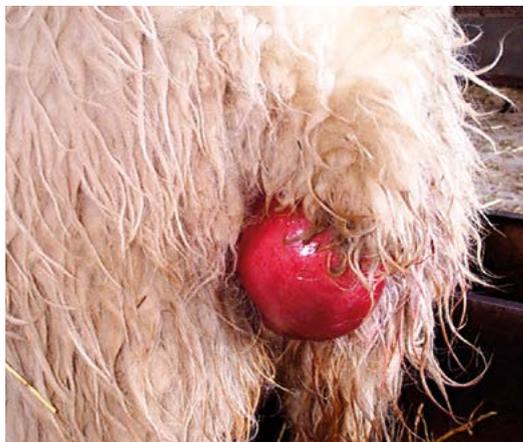
It may be worth asking the vet to blood test a group of 10–12 ewes, three to four weeks before lambing and ideally, four hours after the last supplementary feed. The vet will look for levels of beta-hydroxybutyrate (BOHB) and urea.

BOHB is produced when ewes mobilise body reserves in the absence of sufficient dietary energy. The Moredun Research Institute regards BOHB levels of 1.1 mmol/litre or higher, as a sign that additional feed energy may be needed to guard against twin lamb disease.

Blood urea is a by-product of dietary protein broken down in the liver. Levels of less than 2–3 mmol/litre suggests the diet is lacking in protein.

For more information, see **Improving ewe nutrition**, available in hard copy to order or online at ahdb.org.uk

Other ewe issues



Prolapse

Prolapse occurs in late pregnancy and is a major cause of ewe deaths at lambing. It results in mild to extreme damage to the cervix.

Close observation of ewes is essential to intervene at the earliest opportunity. Affected ewes need a restraining harness or possibly veterinary treatment. Those carrying multiple litters are more prone to prolapse but overfeeding in late pregnancy will also increase the incidence.

Mark and cull any ewes that prolapse.

Pregnancy toxæmia (Twin lamb disease)

A metabolic disorder that occurs in the last four to six weeks of pregnancy. Twin lamb disease can affect any ewe, but those with low or high BCS or carrying multiples are most at risk. It occurs due to a lack of energy intake and decreased blood glucose levels.

The ewe isolates herself, looks dull, will not eat, might appear blind and lies down. She will require glucose treatment as soon as she goes off her food, to give the best chance of survival for both the ewe and the lambs.

Hypocalcaemia

A metabolic disorder that normally occurs in the last four weeks of pregnancy due to the lamb's demand for calcium being greater than the diet is providing. Affected ewes are unsteady, lie down, gradually become comatose and die.

Treat by giving a calcium injection (50–80 ml) under the skin. Within an hour, the ewe should look brighter. Check the diet if a number of ewes are affected.

Feeding ewes lambing outdoors

For outdoor lambing flocks, aim to maintain ewes at BCS 3 and match lambing date to a time when pasture growth picks up in spring. Ensure there is 6 cm of sward height when the ewes have started lambing. Do not feed concentrates in troughs, as this disturbs grazing and lambing behaviour. However, supplementary feeds provided in buckets or blocks can improve colostrum quality and lamb survival.



Problems such as parasitic gastroenteritis (internal worms) and liver fluke will lower the body condition of ewes. This will be made worse for ewes with large litter sizes. If not corrected, they are likely to give birth to small lambs and have poor colostrum supply.

For more information, see **Worm control in sheep** and the **Sheep diseases directory**.

Reducing the risk of abortion

Three types of infectious abortion are responsible for 86% of all sheep abortions.

Enzootic abortion (EAE) (52%)

Caused by the bacteria *Chlamydia abortus*. Results in full-term stillborn or weak lambs. It can affect litter mates to different degrees, e.g. one lamb can be dead and one alive.

Transmission: From sheep to sheep, only at lambing time, as pasture/bedding is contaminated by aborted/infected lambs. Infected sheep and lambs will be carriers.

Action: Do not keep infected sheep or their lambs for replacements. Isolate aborted sheep for at least three to four weeks. Vaccinate all sheep at least four weeks before tupping. Have a vaccination programme for all replacements as part of the flock health plan.

Toxoplasmosis (25%)

Caused by a protozoan parasite *Toxoplasma gondii*. If infection occurs in early pregnancy, the embryo dies and is reabsorbed. In mid-pregnancy, the foetus dies and is mummified. Infection in late pregnancy produces full-term stillborn or weak lambs.

Transmission: Cats to sheep, perhaps through feed, water or pasture contaminated with cat faeces. Young cats become infected when they start to hunt. Older cats have immunity.

Action: Isolate aborted sheep from pregnant ewes, but they can be kept with sheep that have lambed. Keep cats away from feed. Vaccinate all sheep at least four weeks before tupping. Have a vaccination programme for all replacements as part of the flock health plan.

Campylobacter (9%)

Caused by the bacteria *Campylobacter fetus*. Results in full-term stillborn or weak lambs.

Transmission: Sheep to sheep, but infection can be carried by birds.

Action: Isolate aborted sheep from pregnant ewes, but they can be kept with lambed sheep. This deliberate spread of infection will raise the immunity, as no vaccine is available.

Standard procedure for aborted sheep

1. Isolate and permanently mark affected ewes.
2. Adhere to strict biosecurity procedures including disinfection when inspecting aborted ewes or dealing with infected materials.
3. Collect samples of the foetus/lamb and afterbirth. Arrange test with the vet.
4. Dispose of bedding and other infected materials carefully.
5. Reduce stocking rate to lower the risk of infection.
6. Once cause is identified, consult with the vet for best treatment and control.
7. Vaccinate flock, if vaccine is available.

Actions to prevent future infections

- Determine prevalence and cause of lamb losses
- Aim to reduce abortions to less than 2% and barren rate to less than 5%
- Establish a health plan with the vet, which may include a vaccination programme
- Follow a strict biosecurity protocol for dealing with aborted ewes
- Check health status when purchasing replacement ewes

Give lambs the best start in life

Normal lambing behaviour

Ewes exhibit certain types of behaviour when they are about to lamb, including:

- Pawing at the ground
- Alternate standing and lying
- Walking in circles
- Vocalisation/bleating

Labour is usually short but varies with litter size. The time between lambs arriving is normally about 20 minutes. Assistance should be given if labour for one lamb has lasted longer than one hour in experienced ewes, and over two hours in ewe lambs.



A long labour is associated with a large lamb, incorrect positioning, e.g. legs or head back, breach, or under-nutrition during pregnancy.

Table 5. Labour times for ewes with different litter sizes

Litter size	Time taken (minutes) from the start of intense straining to birth of all lambs
Single	65
Twins	90
Triplets	120
Quads	160

Source: Lynch, Hinch and Adams, 1992

Assistance at lambing

Most ewes will lamb without difficulty, but it is important to observe the ewes quietly to detect any problems that arise. If a ewe needs assistance, always have the following to hand:

- Disposable gloves (to reduce picking up any diseases and prevent spreading infections between ewes)
- Disinfectant
- Lubricant
- Antibiotic treatment (as prescribed by the vet)
- Pain relief/anti-inflammatory medication (as prescribed by the vet)

Hygiene

- Keep all lambing equipment as clean as possible, disinfecting between births
- Wash hands before touching another sheep
- Wear disposable gloves to assist ewes
- Bed lambing areas well with clean straw
- Treat the lambs' navels with strong iodine solution, preferably alcohol-based, within 15 minutes of birth. Repeat at least once, two to four hours later



Poor hygiene standards can increase the risk of infections in lambs, such as watery mouth, joint ill, navel ill, and mastitis and metritis (uterus infection) in ewes. Strategic use of disinfectants can help reduce the incidence of these diseases.

Lamb survival

It is important to have all the equipment ready that might be required to optimise lamb survival.

The lambing kit should contain:

- Lambing snare or lambing ropes
- Prolapse harnesses
- Strong iodine solution
- Sterile needles and syringes
- Thermometer
- Stomach tubes and syringes
- Michel's entropion clips to uncurl rolled up eyelids
- 40% glucose (dextrose) solution for injection
- Calcium borogluconate solution
- Twin lamb oral supplement for ewes
- Colostrum supply – ideally, ewe colostrum, artificial ewe colostrum substitute, or pooled colostrum from Clostridial-vaccinated cows
- Electrolyte sachets
- Sterilising solution for feeding bottles and stomach tubes
- Medicines as directed by the vet: anti-inflammatory drugs (reduce inflammation and pain) and antibiotics
- Disinfectant for floors and surfaces
- Reliable and readily available source of hot water
- Warming box
- Notebook, chart or other recording system for recording lamb and ewe losses, medication given and notes about ewes
- Phone number of the vet

There should be facilities on the farm where sick lambs or ewes can be isolated and treated.



How to secure a lambing snare

Step 1.



Ensure the ropes are over the joint.

Step 2.



Gently slide the snare over the head

Step 3.



Place snare over the ears; then move it up into the mouth of the lamb

Step 4.



The dotted line shows the position of the snare. It is now behind the ears and secure in the mouth to aid lambing

Housing design for lambing

A well-designed and managed system at lambing contributes to successful lambing. The layout of facilities should consider all the daily tasks of checking, feeding, watering, bedding and cleaning. Labour is a valuable resource, and there is potential to improve efficiency within the design process.

Whether you are designing a new building or utilising an existing building, make the layout of your lambing space work for you.

Consider what options you have for pen layout:

- What will provide ease of access for people?
- Ease of sheep movements between pre- and post-lambing pens
- Floor slopes will dictate where drainage channels might be needed
- How will pens be cleaned and space requirements for equipment access
- Location of water and power sources
- Lighting for inspection and lambing assistance
- Space for group and individual pens
- Space for hospital facilities and isolation pens
- Storage requirements for concentrates, forage, bedding and colostrum/milk powder
- Feed preparation and hand wash area
- Storage area/cupboard for gloves, syringes, feeding tubes, etc. (see lambing kit page 13)

Lambing sheds should be clean, well-drained and well-ventilated but free from draughts. Effective ventilation of buildings is essential, avoiding high humidity, condensation and draughts, as sheep are particularly susceptible to respiratory diseases. There should be free circulation of air above sheep height with

draughts avoided at sheep level. Pens set up on a well-drained site, or with drainage channels at the front of and outside pens, will help to remove water and urine and reduce straw costs. To aid in keeping bedded areas dry, avoid locating water troughs and buckets over bedding. Ensure that small lambs cannot get into these and drown. Lambing ewes will distance themselves from other sheep, so group pens need to be of sufficient size to enable ewes to distance themselves. There should be sufficient trough space to allow all animals to feed at the same time without competition.

Sheep housed indoors will require both a light and dark period over 24 hours. Where natural lighting is insufficient, artificial light must be provided. Lighting that provides uniform illumination is ideal as sheep are fearful of harsh lighting contrasts and dramatic shadows. Fixed or portable lighting must be available so they can be thoroughly inspected at any time.

A hospital area and isolation pens, sited away from main lambing area, with access to hot water and power provides protection from the spread of infectious disease. Healthy lambs should not be kept in this area. The ideal positioning of an isolation pen is downwind of healthy lambs but upwind of adult sheep. The isolation pen should be outside any shared pen, easy to clean with drainage taking all liquid away from healthy animals. Isolation pens should have dedicated equipment, e.g. stomach tubes that are clearly marked.

Further guidance on housing sheep can be found in the Code of Recommendations for the Welfare of Livestock: Sheep (2003) assets.publishing.service.gov.uk/media/63d298018fa8f53fead8ee8c/Code_of_recommendations_for_the_welfare_of_livestock_-_sheep.pdf

Reducing very young lamb deaths

Birth weight

Careful feeding of ewes will ensure optimum lamb birth weights, i.e. not too light and not too heavy.

Here are some example lamb birth weights optimum for ewes weighing 70–85 kg tupped with a terminal sire.

- Single 4.5–6.0 kg
- Twin 3.5–4.5 kg
- Triplet – greater than 3.5 kg

Birth weights more than 1 kg lighter than these suggest undernutrition of the ewe during late pregnancy. If birth weights are more than 1 kg higher, there is a risk of lambing problems, due to the large size of the lamb and risk of higher losses.

Hill breeds will have lambs with birth weights 1.0–1.5 kg lighter than the figures above.

Small or weak lambs often fail to take in sufficient colostrum and subsequently die from a variety of causes, including starvation, hypothermia, watery mouth and being laid on.

Stillbirths are the biggest loss recorded at lambing. These can be due to infectious diseases but many occur from difficult lambings through injuries, trauma, or lack of oxygen.

Ensure ewes are fed according to litter size and avoid underfeeding or overfeeding.

Lambing problems

Poorly presented lambs can become stuck inside the ewe and ‘drown’ before they make it out. High birth weights and disturbance levels increase the risk, as do high litter size and low supervision levels.

Mis-mothering

Mothering ability varies, but ewes in good condition, that are well fed and not disturbed in labour or just after giving birth, tend to be good mothers.

If ewes are disturbed, they may leave their newborn lambs. Young ewes especially can become alarmed and may need to be penned to help them bond with their offspring. Helping their lambs to start suckling may make them more accepting.



Colostrum intake

Make sure lambs receive 50 ml/kg of colostrum within the first four to six hours of life and continue to consume it during the first 24 hours of life.

In 24 hours, a newborn lamb must receive the equivalent of 200 ml/kg bodyweight in colostrum. For example, a 5 kg lamb needs 1 litre of colostrum in the first day of life.

Taking in sufficient colostrum is vital to provide the lamb with essential immunoglobulins and to protect against clostridial and other diseases, depending on the ewe’s vaccination status.

Colostrum also provides energy, proteins, vitamins and minerals. It is nutritionally complete and a natural laxative.

Studies show that many lambs, particularly triplets and small lambs, do not receive sufficient colostrum during the first hours of life.

If extra supplies are needed, colostrum from another ewe in the flock is ideal. Frozen cows' colostrum can be used but discuss the risks of anaemia with the vet.

Do not overheat when thawing out frozen colostrum, as this destroys the vital antibodies.

Turned out too quickly

Lambs born indoors should only be turned out if:

- Dry
- Suckling well
- Well-bonded to their mothers
- The weather is not cold, wet or windy
- The ewe has plenty of milk

Turn out small groups at a time, allowing mothers and lambs to pair up.

Turning out weak lambs and mis-mothering can lead to high losses. Ensure field boundaries are secure so lambs cannot be mixed up. This will also prevent predators such as foxes gaining access.

Closely observe ewes and their lambs for the first few days. Ensure there is shelter from the weather. Provide trailers or bales if no hedges are available. Make sure the ewes have plenty of feed to maintain milk supply. Supplement with conserved forage or concentrates if grass growth is poor.

Exposure and starvation

The biggest causes of young lambs dying are exposure and starvation.

Exposure leads to hypothermia, which is caused when the lamb cannot produce heat as quickly as it loses it, e.g. when an



unlicked, abandoned, wet lamb is left to shiver in cold weather. Starvation also leads to hypothermia – in essence, a shortage of blood glucose in lambs over 12 hours old, which have none of the brown fat they were born with remaining and no colostrum in their stomach.

This can often occur when lambs are mis-mothered, even if the weather is fine.

Look out for lambs with dirty necks, as it can indicate stealing milk from other ewes.

Take a lamb's temperature

- Insert thermometer into rectum to 4 cm
- Read temperature after 30 seconds
- More than 40°C (104°F) – fever or overheating due to too much warming
- 39–40°C (102–104°F) – normal
- 37–39°C (99–102°F) – moderate hypothermia
- Less than 37°C (99°F) – severe hypothermia

Consider the age of the lamb. If it is more than five hours old, it is unlikely to have significant stores of brown fat left.

Therefore, it is important not to warm it without providing glucose or milk first (see flow chart page 20).



Warming a lamb

- Dry with a towel first
- Use warming boxes (at least 1.5 m² and 1 m high) with warm air fans. Aim for 35–37°C (95–99°F)
- Avoid infrared lamps as overheating can easily occur
- Retake temperature every 30 minutes. When over 37°C (99°F), remove lamb from box and give milk via stomach tube



Feeding a lamb with a stomach tube

Lambs should be given extra colostrum if the ewe is lacking milk or it is of poor quality.

- Do not tube very weak or unconscious lambs

- Feed lambs with colostrum four to five times in the first 24 hours
- Prepare colostrum or, if the lamb is older than 24 hours, milk to blood temperature, but not in a microwave, as it destroys the antibodies
- Sit on a bale with the lamb on your lap
- Gently introduce a clean stomach tube via the left side of the mouth
- Do not force the tube down. Softening plastic tubes in warm water helps
- The tube should only reach to just below the lamb's shoulder. In small lambs, measure the length of the tube from tip of nose to behind the shoulder before inserting, to check it does not go in too far (see below)
- If the lamb shows signs of distress, remove and try again
- When the tube is in place, the lamb should show no sign of distress
- Attach syringe of colostrum/milk and depress plunger slowly for 20 seconds
- Leave the tube in place and repeat until all feed is given
- Remove the tube and syringe
- Wash and sterilise tube and syringes. Leave in hypochlorite solution such as a baby bottle sterilising solution until required again



Giving a glucose injection

Ask the vet for a demonstration.

Use a sterile syringe and new needle each time.

Do not give to scouring lambs or those with watery mouth.

1. Prepare 10 ml of 20% glucose solution per 1 kg of body weight immediately before use. To make up a 20% solution, draw up 10 ml dextrose 40% or 40% glucose solution and add 10 ml recently boiled water – ensure this is at blood temperature, i.e. warm but not a very hot solution.
2. Hold the lamb by front legs and allow body to hang down.
3. Spray injection site – approximately 2.5 cm (1 inch) to the side and 2.5 cm (1 inch) below the navel – with iodine spray/antibacterial spray.

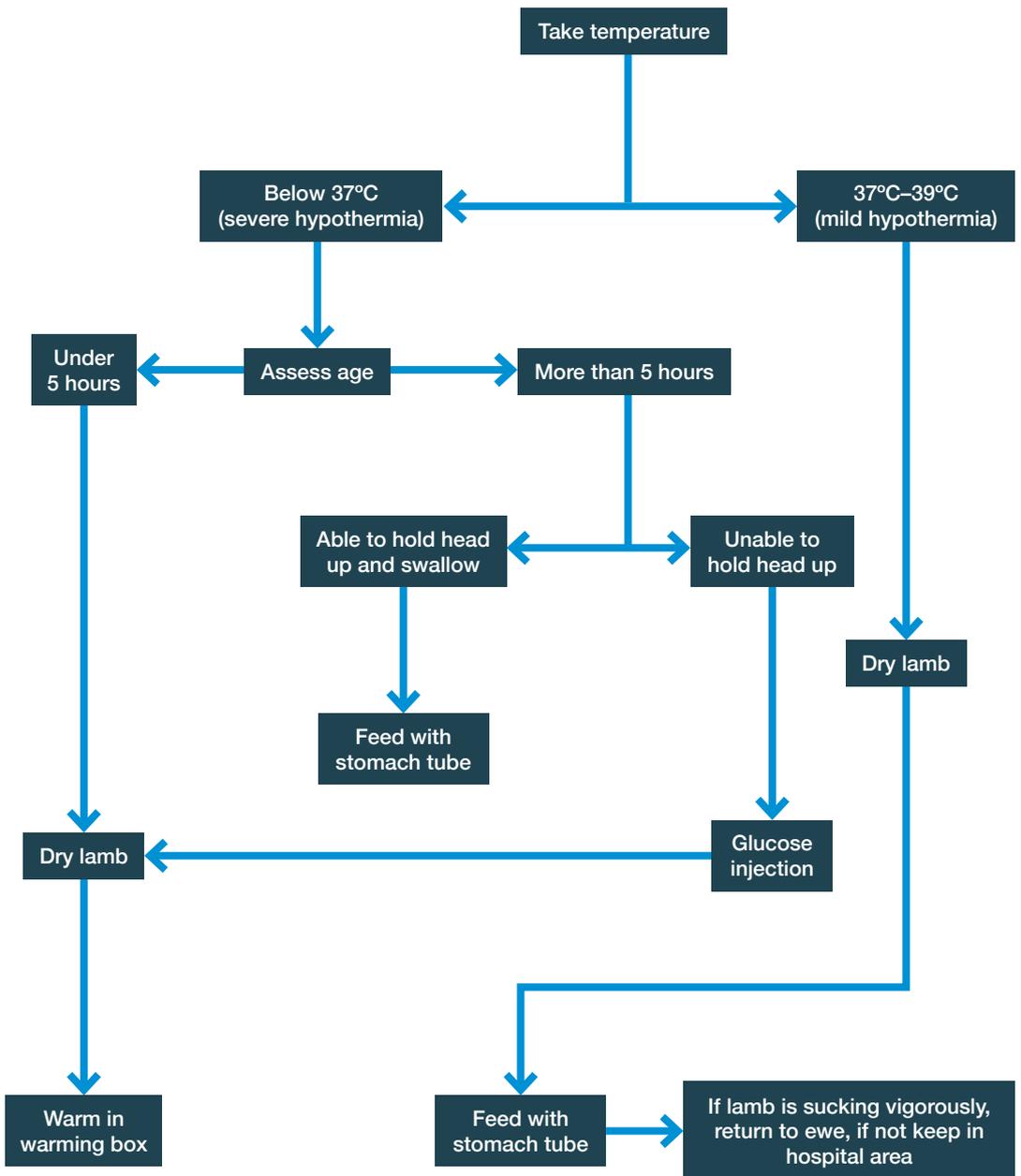
4. Use a 19 gauge 2.5 cm (1 inch) long needle.
5. Insert needle into the abdominal cavity at a 45° angle, so needle is aimed towards the lamb's rump. Insert needle to the hub.
6. Draw back slightly with syringe to check that no blood, urine or milk appear in syringe. If this happens, detach needle and syringe and start again using a fresh needle and fresh solution.
7. Empty syringe and carefully withdraw.
8. Dispose of needle and disinfect syringe.

The vet may recommend a precautionary injection of long-acting antibiotic.

After the lamb has received glucose, warm up first and then give colostrum feed.



Lamb survival flow chart



Lamb post-mortem examination

Lamb survival is key to maximising rearing percentage, so it is worth spending time investigating the cause of any lamb deaths.

It is important to consult your veterinary surgeon for post-mortem examinations and further investigations. However, learning to open up young lambs three days old or less, to rule out common issues such as starvation, cold or difficult lambing is useful. It can help identify problems and inform changes in management or possible solutions. This is particularly useful for those lambs that may have been laid on and not been seen sucking or standing.

Caution



Due to zoonotic risks (diseases transmitted from sheep to humans), never open up lambs that are suspected abortion cases or have abnormalities – always consult the vet on these cases.

Look at the coat, feet, navel, head and body for obvious signs of damage or abnormalities. Also look at the fat reserves and for any blood clots in the abdomen or chest. Check for milk clots in the stomach or intestines, then inspect the lungs and thyroid glands.

Collect information on the age, sex and whether there was any intervention at birth or treatments given, such as a stomach tube or antibiotics.

Simply weighing the lamb can provide useful information. Under 3 kg suggests undernutrition and lack of body reserves. Heavier than 6 kg would have increased the risk of lambing problems. Meconium staining (when the coat is yellow), indicates stress during delivery.



Lamb post-mortem on-farm investigation example

Table 6. Lamb post-mortem on-farm investigation example

Did the lamb die from starvation?		
Has the lamb been licked?	Yes	
Has the lamb walked?	Yes	The membranes (slippers) are no longer on its hooves
Is the navel normal?	Yes	No swelling. Starting to dry
Is the head normal?	Yes	No swelling
Is the body normal?	Yes	No swelling. No meconium (yellow) staining on fleece
Are the brown fat reserves still around the kidneys and heart?	No	The lamb used up its first energy reserves (generally within hours of birth)
Are there any blood clots in chest or abdomen?	No	If present, it suggests birth difficulties
Is there any milk in the stomach or intestines?	No	No milk in the stomach or intestines suggests the lamb did not suckle
Did the lamb breathe?	Yes	Place a small piece of lung in water to see if it floats Un-inflated lungs sink, which means the lamb never breathed
Any sign of iodine deficiency (enlarged thyroid glands)?	No	
Yes: the lamb died of starvation		

If a lamb has died from starvation, it is worth checking, if:

- Both the ewe's teats are clear and producing milk
- Colostrum supply is good enough
- Ewes are mis-mothering their lambs to look for feed
- Stocking density was too high, so ewes and lambs lost each other
- Lambs were checked for whether they have sucked within six hours
- Lamb was one of a triplet
- Lambing site is exposed
- Weather has been unfavourable

A **Post-mortem worksheet** is available to download and print from ahdb.org.uk/knowledge-library/lamb-post-mortem

Infectious diseases and other issues

Entropion (in-turned lower eyelids)

A common problem in some flocks, this condition is where the lower eyelids are rolled up and eyelashes constantly rub against the surface of the eye. This is very uncomfortable and makes the lamb's eyes runny and the cornea cloudy.

It can be easily corrected if detected early, by pulling out the skin of the eyelid and pinching it slightly. Repeat, if necessary, until it stays in place. If not spotted at birth, it has to be corrected by injecting antibiotics into the bottom lid or by using Michel clips.



Joint ill

Joint ill is caused by infection, which can be ingested or may enter the body through open wounds such as the navel in very young lambs or through tagging, docking or castration wounds in slightly older lambs.

Affected lambs are usually dull, with one or more swollen, painful joints. Infection can also occur in the spine, resulting in paralysis of either the hind limbs only, or all four legs.

These lambs require treatment as soon as possible. Consult the vet for the most appropriate treatment.

Navel infection

When ewes lamb outdoors, navel infections are rare unless the field is overcrowded or muddy. The risk with indoor lambing is much higher, so it is important to treat navels with strong iodine (10%) to encourage them to shrivel up and dry.

Wet navels can easily become infected with bacteria from the lambing environment. There is a danger that infections that start in the navel will track up the cord to the liver. Often, lambs do not respond to treatment.

Keep the lambing environment as clean as possible and the lying areas well bedded.



Physical deformities

Lambs can be born with no opening to the rectum on the outside. The lamb appears normal until it cannot pass faeces. Its stomach becomes swollen and it stops suckling. There is little that can be done successfully to alleviate the problem and euthanasia is the kindest course of action.



Scouring

There are many causes of diarrhoea in lambs – nutritional changes (often seen in artificially reared lambs), bacteria (e.g. *E.coli*, *salmonellosis*, *clostridia*), virus infections (e.g. *rotavirus*) or protozoa (e.g. *cryptosporidiosis*). Scouring lambs do not thrive. If they are scouring due to an infection, they will look ill.

Trace element deficiencies

Copper, selenium and iodine deficiencies can all lead to problems in young lambs.

Copper is a difficult element to correct; too much is toxic and too little can cause swayback – causing incoordination and a tendency to sway on their back legs. Some breeds are more susceptible than others.

Ewes that suffer from selenium deficiency can give birth to weak lambs. In older lambs up to six months old, this manifests as White Muscle disease (stiff lamb disease).

If these issues arise, discuss them with the vet to find the best solution for the farm.

For more detailed information on trace elements and minerals, see the BRP+ document **Trace element supplementation of beef cattle and sheep** and the **Improving ewe nutrition** manual at ahdb.org.uk

Watery mouth

A common problem in many flocks, watery mouth is caused by lambs swallowing bacteria from the environment. The bacteria produces toxins which, when absorbed by the lamb, cause drooling and swelling of the abdomen.

Affected lambs usually stop feeding, show signs of abdominal pain and are wet around the mouth. Lambs need to be treated rapidly with antibiotics and anti-inflammatory drugs or they will quickly die.

E.coli is commonly isolated from cases. However, inadequate colostrum intake is usually the underlying cause. Discuss control and prevention with the vet and check that ewe nutrition, body condition and hygiene practices at lambing time are all optimal.



Ewe problems that affect lamb survival

Mastitis

Acute mastitis in ewes is rare and is usually seen in the first weeks after lambing. The ewe may stop her lambs suckling because her udder may become hot, swollen and painful. An infected ewe may not have milk in the affected half of her udder, but instead a watery liquid that may contain pus or blood. The amount of milk available to the lambs is significantly reduced.

Most cases of mastitis are subclinical udder infections carried over from the previous lambing, or chronic mastitis, which usually occurs at weaning. The ewe may not look ill but overall milk yield will be reduced. Mark and cull affected ewes.



Ewe with metritis



Metritis

This is an infection in the uterus caused by an infectious abortion or after unhygienic interference for a difficult or assisted lambing. It can also be common following replacement of a uterine prolapse.

The ewe looks depressed, will not eat, or show interest in her lambs and she will often have a swollen vulva with a smelly discharge. Milk yield will be reduced. She will require antibiotics and anti-inflammatory treatment.

Listeriosis

This can occur at any time of the year but is most common when ewes are fed silage, so must be considered if ewes are ill in late pregnancy. During this time, their immune system is less effective so they are more susceptible to disease.

The bacteria that cause listeriosis are found in the soil. If this is incorporated into the silage – if the grass was cut too low or there were a lot of molehills, the bacteria multiply, especially if air is present.

Ewes look dull, show slight paralysis and can circle. If caught early, the vet can treat with intravenous antibiotics but, if far progressed, treatment often does not work. Best practice silage making will reduce the risk of disease.

Health issues causing losses in older lambs

Coccidiosis

This disease strikes lambs at four to six weeks old and is prevalent in intensive systems. Infection is caused by a small protozoan parasite, which invades the intestinal cells of lambs.

Mortality can be high and animals that recover are permanently damaged.

Risk factors include the use of nursery paddocks, poor colostrum intake, mixed age groups and high stocking rates.

Risk can be reduced by managing lambs of different ages in separate groups, or introducing a coccidiostat into the creep feed. Discuss targeted drench treatments with the vet.

Liver fluke

Liver fluke disease is caused by a parasite living in the bile ducts of sheep. Incidence is increasing in the UK due to milder winters and wetter summers, which favour populations of the mud snail – the essential intermediate host of the parasite.

Lambs can become infested on 'flukey farms' during summer, and growth rates suffer and they will not finish as quickly as expected. Lambs need to be treated in the autumn. Consult the vet for the best products to use.

Follow Sustainable Control of Parasites in Sheep (SCOPS) guidelines to reduce the risk of resistance of liver fluke to wormers. See scops.org.uk

You can find more about Liver fluke in AHDB's **Liver fluke in grazing livestock** manual.

Nematodirus

This worm infestation usually affects lambs in spring (April/May) and is worse when warm weather follows a cold snap.

Unlike other worms, nematodirus passes from lamb to lamb. It usually takes a year

to complete its life cycle, so risk is highest in pastures that carried lambs the previous spring.

Regional warnings are given by organisations such as SCOPS, the National Animal Diseases Information Service (NADIS), or consult the vet.

Do not assume that scouring lambs have worms. Take faecal worm egg counts (FEC) to monitor worm burdens in lambs before treating.

Affected lambs can be treated by drenching with a white (BZ) wormer.

Orf

Orf is a highly contagious skin condition, which mainly affects young lambs. The virus causes lesions to develop on their mouths. The lambs normally manage to suckle and recover after a couple of weeks but ewes can suffer if it transfers to their udders. It can affect milk supply and there is a high risk of mastitis.

Ewes and lambs can be vaccinated on farms with a known orf problem – but this should not be used on farms that do not have a history of orf.



Lamb losses record sheet

Keep a tally using a sheet like this, wall chart or blackboard to record lamb losses. This will help identify what the diseases/main problems are. Then put management practices in place to prevent further losses now and in the future.

Examples of cause of loss

- Stillbirth – unknown
- Stillbirth – difficult lambing
- Large lamb
- Small/weak lamb
- Abnormality
- Abortion
- Bad/mis-mothering
- Disease
- Weather
- Starvation
- Predation
- Ewe died
- Hypothermia
- Lamb laid on
- Other

Example of lamb losses record sheet

	5					10					15					20				
Watery Mouth	X	X																		
Stillborn - difficult lambing	X	X	X	X	X															

Lamb losses can also be recorded using the **Flock notebook**.

Further information

Other publications from AHDB

- Sheep diseases
- Liver fluke control in grazing livestock
- Flock notebook
- Worm control guide
- Improving ewe nutrition

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