

Healthy calf rearing system checklist



This checklist aims to provide a structured approach to assess a calf rearing system.

It encourages producers to think about the key factors determining the health of calves in the system, which can then be used to draw up a plan of action to make improvements, if any are needed.

Assess and prevent

Cattle succumb when the disease pressure overcomes their immune system, which could be caused by a range of factors such as poor nutrition or environment stressors.

There are a number of areas of management that can affect the incidence of disease on farm.

This checklist provides guidance on identifying problem areas.

This checklist should be completed every 6 months, preferably with a vet.

Do not underestimate the impact of the environment; if the housing is poor, even high levels of immunity will not prevent infection.



NUTRITION

Calves actively helped to take in sufficient colostrum soon after birth

Feed three litres within two hours of birth, followed up by a similar sized feed within 6–12 hours of birth. Blood test bought-in calves to make sure they have received adequate amounts of colostrum.

For further information, see the 3 Q's of colostrum management available on the AHDB Dairy website.

Concentrates offered from birth

Feed a good-quality starter feed (18% crude protein fresh weight, 12MJ ME/kg DM) to promote rumen development. This needs to be free from dust and mould and offered in clean troughs.

Used good-quality milk replacers

Milk replacers should contain 20–26% crude protein and 18–20% fat to achieve optimal growth rates. Calves less than 2 or 3 weeks of age are better able to digest powders with milk-based proteins (eg dried skimmed milk, dried whey, delactosed whey, casein) than egg-based or plant-based powders (soya, wheat gluten, pea). Generally higher quality ingredients are more expensive.

For further information, see Calf milk replacer available on the AHDB Dairy website.

Consistent feeding regime

Calves should be fed at the same time each day at the same temperature, at the same concentration and with the same product to avoid digestive upsets.

Milk replacer or whole milk fed between 37–39°C

When preparing milk powder, it should be made up with warm water. Water used to mix milk replacer should always be below 50°C to avoid damaging the proteins which are essential to calf performance. Milk should be fed between 37–39°C to stimulate a strong oesophageal groove reflex, which helps prevent milk entering the rumen.

Calves fed at least two milk feeds per day until four weeks of age

Feed a minimum of 750g/day of milk replacer. It is a legal requirement to feed calves under 28 days old at least two liquid feeds per day.

Fresh, clean water available at all times from birth

All calves must be provided with fresh, clean water from birth. For each 1kg of dry feed, a calf requires five litres of water.

Fresh straw available in racks

Chopped straw should be offered from three days of age. Hay and silage can lead to calves having a potbellied appearance.

Bought calves given two litres of electrolytes on arrival

Calves frequently become dehydrated during transport.



HEALTH

Herd health plan reviewed each year with vet

A herd health plan is a continuous process which can be used to improve animal health and welfare.

Bought-in calves have a known disease status

Disease in the early stages of life can affect long-term performance of the animal. Test for BVD to ensure calves are not persistently infected (PI) with the virus.

For further information on BVD and the BVDFree scheme visit the BVDFree website at www.bvdfree.org.uk/the-disease/ or read the AHDB Dairy Cattle purchasing checklist.



Sick calves isolated from the rest of the youngstock

Sick pens ensure that there is no physical contact between the diseased calf and the rest of the herd. The sick pen should be very clean, warm, have clean water available at all times and provide no additional stress to the calf. Isolated calves should be fed last to minimise disease spread.

Vaccination programme in use

Vaccination protocols are an essential part of herd health planning and should be developed by the farmer and vet together.

For further information, see [Using medicines for Better Returns manual available on the AHDB Beef & Lamb website.](#)

Medicines stored correctly

Check vaccines are stored in the fridge at 2–8°C or according to medicine instructions. Check medicine cupboard for out of date medicines and dispose via your vet.



Cases of disease recorded and levels tracked to drive continual improvements

TARGET: Less than 15 cases of pneumonia per 100 calves reared to weaning

TARGET: Less than 10 cases of scour per 100 calves reared to weaning

TARGET: Less than two calves die per 100 calves reared to weaning

Use of antibiotics

Therapeutic use only

Antibiotics used to treat calves showing signs of ill health

Metaphylaxis

Treatment of animals in contact with sick animal

Prophylactic

Treatment of healthy animals before exposure/stressful event

HOUSING

Ventilation – air space is just as important as floor space. Ventilation is the removal of stale, exhaled air to provide a supply of fresh air

Airy, pleasant atmosphere when entering the calf shed

Airflow should be above calf level to minimise chills. Ammonia smells in the calf shed are a sign of poor air quality.

When smoke bombs are activated, the smoke travels up and out of outlet areas and clears within 30–45 seconds

Slow movement of the smoke throughout the building indicates a high risk of pathogen transfer from one affected animal to an entire group due to poor air flow.



Figure 1. Use of a smoke test to show the flow of air within the building

Top Tip: smoke bombs are available from most plumbing centres.

For further information, watch the [AHDB Beef & Lamb video Assessing calf buildings](#) which explains techniques used to remove excess heat, vapour and viruses while providing an even distribution of air flow and speed.

Draughts minimised

Even in cold weather, calf housing needs plenty of fresh air, however it is important that draughts at calf level are avoided. Draughts can impact on growth rates in cold weather as calves start using energy to keep warm instead of to grow.

Solid barriers that extend from the floor to above calf level can offer protection from draughts. If calves are housed in an exposed or tall building, consider making lower covered areas where they can keep warm.

Table 1. Air speed at calf level

Air speed	Affect of air speed on environment
<0.5m/s	Stale air – increases bacterial survival and pneumonia
0.2m/s	Draught free – ideal
>0.3m/s	Draught on calf – calf will become chilled

Notes: m/s = metres per second

No evidence of cobwebs, dust build up or condensation on the inside of the roof

These are signs of poor ventilation.

Use of mechanical ventilation

Most calf houses would benefit from mechanical ventilation with a fan which draws air in from outside and distributes it down the length of the building through a duct.

For further information, see the BRP+ document [Better cattle housing design](#), available on the [AHDB Beef & Lamb website](#).

Humidity – high moisture levels in calf sheds promote the survival of harmful bacteria

Calf shed feels dry, no condensation

Wet floors or sweat and dirt on calf coats are signs of high humidity. Relative humidity levels should be below 75%. This is key to reducing the spread of disease and reducing pneumonia pathogen survival time.

Assess drainage and storage facilities in feed preparation area

Moisture from the feed preparation area, including equipment washing facilities, can cause excess moisture in the calf house.

No evidence of rusting or stained roof structures

These are signs of condensation which can often occur with corrugated iron roofs.

Gutters and drains working and clean

Effective drainage is key to ensuring calf pens remain dry. Pen floor gradients need to be at least one in 20. Ideally, igloos and hutches should be placed on a gravel bed to allow good drainage. Ensure water drinkers are not leaking.

Stocking density adequate

Table 2. Stocking density

Weight of calf	Minimum (statutory) area allowance per calf for grouped calves (m ²)	Recommended area allowance per calf (m ²)
<45kg	1.5	2
46–99kg	1.5	3
100–149kg	1.5	4
150–199kg	2.0	5

Source: Red Tractor Standards, 2016

Calves housed with other calves of similar age

Calves must be group housed from 8 weeks of age, as this increases social development and growth rates.

Bedding – provides thermal comfort for calves

Bedding is dry and clean

The bedding should not be wet or make a noticeable squelch when a boot is lifted up. Barley straw is more absorbent than wheat.

When nesting, the calf's legs are not visible

Deep bedding provides a method for the calf to reduce heat loss. Studies have shown that the incidence of pneumonia is reduced when the animal is allowed to nest. This is because the calf is able to use its energy to maintain its immune system rather than to keep warm.



Figure 2. Well-nested calves

Temperature – in cold weather calves require more energy to keep warm

Temperature monitored daily in the calf shed to assess if the lower critical temperature (LCT) has been reached

LCT is the temperature at which a calf needs extra energy to keep warm.

Table 3. Lower critical temperature (LCT) for calves

Calf age	Lower critical temperature (°C)
Newborn – 3 weeks	10–15
3 weeks +	6–10



Table 4. Additional milk replacer or whole milk given when lower critical temperature drops

Environmental temperature (°C)	grams/day of additional milk powder*		litres/day of additional whole milk+	
	Birth to 3 weeks	3 weeks to weaning	Birth to 3 weeks	>3 weeks
20	0	0	0	0
15	0	0	0	0
10	50	0	0.33	0
5	100	50	0.67	0.33
0	150	100	1.0	0.67
-5	200	150	1.33	1.01
-10	250	200	1.67	1.33

Notes: * = Based on a basic diet of 6 litres (900g) of milk replacer with 18% fat and 22% protein containing 18.5MJ/kg of ME mixed at a rate of 150g made up to 1 litre with water. + = Based on a basic diet of 6 litres of whole milk containing 4.03% fat and 3.28% protein, 22.3MJ/kg of ME on a DM basis

For further information, see [Managing calves in cold weather available on the AHDB Dairy website](#).

Calf jackets used when temperatures fall below 15°C for calves less than three weeks of age

When temperatures fall below 15°C, calf jackets, coats or blankets can be used to help keep calves less than three weeks of age dry and healthy. Before investing in these products ensure your calves are receiving sufficient energy and have dry bedding to keep warm.

For further information, see [Calf jackets available on the AHDB Dairy website](#).

- Calves monitored for signs of heat stress including sweating, panting, drinking excessively and rectal temperatures above 39.4°C**

At environmental temperatures above 25°C calves become heat stressed.

For further information, see read [Monitoring calves in warm/hot weather](#) available on the [AHDB Dairy website](#).

HYGIENE – poor hygiene in the calving area and calf shed has an adverse effect on calf health and performance

- Clean clothes worn and boots dipped when entering the calf shed**

Ensure there is a boot dipping station with fresh disinfectant at the correct concentration. Remember disinfectant cannot penetrate dirty boots.

- Calving area cleaned out as regularly as possible and kept well bedded**

When a calf is born it has no immunity, therefore, cleanliness in the calving shed is a necessity.

- Calving ropes cleaned, disinfected and well maintained**

Ensure hands are either washed or gloved before assisting in any calvings.

- Navels dipped to prevent infection**

Navels dipped as soon as possible after birth, using a clean dip cup and 7% iodine solution. This aids the drying and closure of this potential infection route. Studies have shown that calves with undipped navels have an 11% higher mortality rate than those with dipped navels.

- Pens steamed cleaned using an appropriate disinfectant and have a resting time between batches of calves**

Appropriate disinfectants can be found by searching Defra disinfectants on your search engine.

- Feeding equipment cleaned and disinfected between feeds**



For further information, watch the [Calf house hygiene video](#) available on the [AHDB Dairy YouTube channel](#)

- Disbudding carried out when calves are less than two months of age**

At this age calves still have immunity from their mother's colostrum and the horn is not fully developed. Never disbud at stressful times such as weaning or movement as this can reduce the animal's immune system.

MONITORING

- Calves bought in are no younger than seven days old and weigh at least 50kg at two weeks of age
- Calf growth monitored using a weigh scale or weigh band
- Calves gaining on average 0.7kg/day from birth to weaning



Growth rates higher than 1.3kg/day indicate increased susceptibility to pneumonia. Note that fast growing double-muscled cattle tend to be more susceptible to pneumonia than less muscular cattle.

- Calves gaining on average 1.0kg/day post 12 weeks
- Calves checked at least twice a day

Record and monitor early signs of illness, such as discharge from eyes or nose, cough, dirty hindquarters and scour. Record and analyse health problems and re-treatment rates.

For further information, see the [Better Returns from calf rearing manual](#) available on the [AHDB Beef & Lamb website](#).

It is important to act and identify problems **EARLY** to reduce the severity and duration of the health problems, helping to lower the risk of irreversible damage.

SIGNS OF PNEUMONIA INCLUDE:

- E**yes and Ears – discharge from the eyes and droopy ears
- A**ppetite – reduced appetite
- R**ectal temperature – above 39.4°C
- L**ungs – coughing, nasal discharge and laboured breathing
- Y**OUR responsibility to act quickly

For more information contact:

Better Returns Programme
AHDB Beef & Lamb
Stoneleigh Park
Warwickshire
CV8 2TL

T: 024 7647 8834
E: brp@ahdb.org.uk

beefandlamb.ahdb.org.uk

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