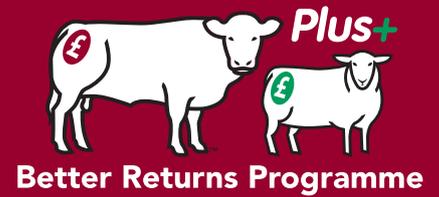


Managing cattle and sheep during extreme weather events



Information compiled by AHDB Beef & Lamb

Key messages

- + In hot conditions, fast breathing and drooling in cattle suggest animals are suffering from heat stress. In sheep continual panting suggests they are suffering
- + High temperatures will affect feed intakes, growth rates, ovulation, conception rates and bull/ram fertility
- + Farmers should draw up action plans for coping with periods of uncharacteristic weather and its aftermath
- + Providing a plentiful supply of clean water is essential for alleviating heat stress in livestock
- + In dry periods, house finishing cattle quickly to free up grass for other stock and to prevent weight-loss
- + Investigate the potential for growing drought-tolerant forages, such as chicory and cocksfoot
- + Identify areas that may flood in extreme rainfall events and establish an evacuation plan
- + During floods, livestock need food and clean water. Be aware that existing stocks and supplies may have become contaminated
- + Consider providing extra forage to stock during cooler times of the day, to help compensate for reduced feeding activity in the heat of the day
- + Make a disaster kit and place it in a central location. Let all workers know where it is and check the contents regularly

Keywords:

Extreme weather and livestock, heat stress in cattle and sheep, looking after cattle and sheep during drought, flooding on livestock farms

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Introduction

Climate change could present potential challenges to cattle and sheep producers in the future.

Extreme weather events can impact production performance, eg by adversely affecting fertility or growth and may lead to welfare issues.

The three main worries on beef and sheep farms are heat stress, drought and flooding. Forward planning is crucial to reduce cost, risk and concern in future.

Thanks to the Hereford Cattle Society and GP-Engineering for photography.

Heat stress

The threat of drier, hotter periods is likely to increase so farmers consider what they could do for their animals before, during and after a period of high temperature, with or without high humidity.

Targets

- + Identify ways to reduce impacts on performance
- + Understand how to deal with hot conditions
- + Identify fields that offer the best protection for stock

In hot conditions, fast breathing and drooling in cattle strongly suggest animals are suffering from heat stress, especially if they are relatively inactive. In sheep continual panting suggests they are suffering from heat stress, especially if they are relatively inactive.

In hot conditions, fast breathing and drooling in cattle suggest animals are suffering from heat stress. In sheep continual panting suggests they are suffering.

If nothing is done to relieve the situation and their body temperature remains high, there is a real danger they could collapse and die.

High temperatures will affect feed intakes, growth rates, ovulation, conception rates and bull/ram fertility.

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Management guidelines

- + Provide grazing stock with access to fields that have sufficient shade in the form of hedges or trees, while being alert for fly problems
- + Cattle buildings must be adequately ventilated and space allowances increased by reducing stocking densities if possible
- + House sheep if necessary, but only if the buildings are well ventilated, providing at least 1m² of floor space per ewe and 0.6-0.7m² per 25-35kg lamb
- + Maintain particularly good drainage and ventilation in areas of accommodation prone to wetting, to avoid additional heat stress caused by increasing humidity
- + Consider wetting the heads and backs of housed cattle if their breathing rate exceeds 100 breaths per minute. Do not use cold water (less than 25°C) or apply to the face or use high pressure hoses
- + Move, gather, handle or transport animals only in the cooler conditions of early morning or late evening if possible
- + Give special attention to younger calves/lambs, as they are markedly more susceptible to heat stress than older animals
- + Provide extra forage to stock during cooler times, to help compensate for reduced feeding activity in the heat of the day



Provide shade for grazing stock via trees or hedges

Provide extra forage to stock during cooler times, to help compensate for reduced feeding activity in the heat of the day.



Tipping troughs are easier to keep clean than conventional troughs

- + Ensure all water troughs are working effectively. Provide extra trough space if necessary and shade troughs where possible
- + Check housed and grazing livestock regularly and thoroughly for signs of heat stress, as well as any other health or welfare problems

Clinical signs of heat stress – in order of increasing severity

- 1 Refusal to lie down – possibly to maximise surface area
- 2 Huddling
- 3 Body splashing – attempting to wet coat by splashing head in water trough
- 4 Increased respiration rate – especially serious when accompanied by deep flank movements
- 5 High rectal temperature >41°C
- 6 Open mouth breathing, head extended, tongue protruding, profuse salivation and front legs held wide to increase lung volume. This is a sign of advanced heat stress

Water supply

Providing a plentiful supply of clean water is essential for alleviating heat stress in livestock. Troughs should be designed to supply water rapidly and provide enough space so all those that want to drink at any one time can do so.

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Consideration needs to be given to the location of emergency water supplies and the benefit of storing rainwater for future use. There will be variation in water consumption (see Table 1).

Table 1: Average consumption of water for different classes of livestock

Class of stock	Average consumption per head per day (litres)
Lactating beef cows	40-70
Beef dry cows	15-40
Growing cattle	15-50
Finishing cattle	25-75
Ewes with lambs	4-14
Weaned lambs	2-7
Dry ewes	2-9
Rams	2-10

Note: water requirements are highly dependent on the type of ration fed, ambient temperature and stage of the production cycle, particularly whether lactating.

Table 2: Factors affecting water requirements

Factor	Reasons
Water quality	Salinity, acidity, toxic substances, or algal growth can affect water consumption and increase the need for an alternative supply
Trough contamination/access	Contamination by dung or soil may reduce intake and can cause disease. Troughs should be regularly checked and cleaned if necessary Ensure trough is accessible as water consumption may reduce if access is difficult
High air temperature	As temperature increases, water requirements will increase as the animals will lose more through evaporative cooling (panting). Consumption in summer will generally be 40% higher than in winter
Water temperature	Animals prefer water at or below body temperature and avoid drinking warmer water. Cool water is preferred in hot conditions
High dry matter diets	More water is required to maintain the movement of coarse, dry or concentrated feed during digestion, as there is less water in it than forage
High feed intake	Water requirements are generally 2-4 litres per kg of dry matter intake
Salt licks	Feeding salt or salt-based licks during hot weather increases water intake. However, additional minerals will be needed if the animals urinate more, as minerals will be lost in the urine
Age and condition of stock	Young calves/lambs, pregnant and lactating cows/ewes will require more water and will visit the supply more often
Rate of gain	High performing animals will have a higher water requirement
New field	Always familiarise stock with the location of troughs and check for any problems of access
Stress	Newly arrived stock may refuse water due to differences in its palatability. Consumption will decline during periods of high activity. Illness may vary an animal's drinking pattern – increasing or reducing it
Shearing	A sheep with a thick fleece is relatively immune to changes in ambient temperature, due to the thick insulating layer surrounding its body. Note: sheep cannot cope with a rapid increase in activity as heat cannot be lost from the body A sheared sheep has increased heat load, as the insulation of the fleece has been lost so the amount of water lost through evaporative cooling (panting) increases. Newly shorn sheep must have access to shade Rams can be heat stressed during summer, so should be shorn early to allow some fleece to grow back while still allowing for heat loss. They must have access to shade and water

Drought

The threat of drought is likely to increase in the UK. Farmers should have action plans in place for before, during and after periods of low rainfall.

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Targets

- + Identify ways to reduce impacts on performance
- + Prevent heat stress from becoming an additional problem
- + Consider using drought-tolerant forage varieties

Management guidelines for cattle

During dry periods place bales of straw in fields for additional feed. If straw intake exceeds 2kg per head per day, supplementary feeding will be needed to maintain condition and performance. Monitor pasture cover during dry periods.

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Investigate the potential for growing drought-resistant forages, such as chicory and cocksfoot.

- + Be aware that hungry calves may gorge themselves if they are presented with new feedstuffs, which may lead to acidosis. Introduce additional feed slowly before extreme shortages occur
- + Investigate the potential for growing drought-resistant forages, such as chicory and cocksfoot
- + Appreciate that body condition has a major impact on fertility, so supplementary feeding will help maintain herd performance by ensuring cows are in the correct condition for service and pregnancy



Cattle grazing dry, yellow pasture

Suckler cows

- + Creep feed suckled calves of spring-calvers to reduce their grass intake, making more available for the cows to eat, while reducing milk demand
- + Minimise nutritional stress in spring-calvers for five to six weeks post-serving, to reduce potential embryo loss
- + Check the nutritional requirements of the bull are being met to ensure he is fit for working
- + In extreme conditions, wean calves early to allow the dry cows to be fed normal winter rations and for the weaned calves to be managed separately
- + Monitor autumn-calvers, as some loss of condition may be acceptable. However, too much loss may cause calving problems

Table 3: Target body condition score for cows and heifers

	Spring-calving herds	Autumn-calving herds
Calving	2.5-3.0	3.0
Service	2.5-3.0	2.5-3.0
Housing	3.0-3.5	3.0



House finishing cattle sooner to free up grass for other stock during a drought

- + Recognise that in-calf and first-calved heifers are the priority, as they are more sensitive to periods of under-feeding due to their own requirements for growth, as well as their growing calf's needs
- + Remember that when the drought ends, the resulting surge of grass may increase the risk of grass staggers (hypomagnesaemia)

Growing cattle

- + Appreciate that recently weaned calves could be sold as stores, finished intensively or moved to better grazing
- + Evaluate whether growing cattle should be moved onto finishing rations sooner than usual, which will result in a lower slaughter age/weight

Table 4: Effect of daily liveweight gain on feed costs to gain* 100kg

Daily liveweight gain (kg/day)	Total feed costs (p/d)	Days to gain 100kg	Total feed costs to gain 100kg (£)
0	66	-	-
0.4	86	250	215
0.8	124	125	155
1.0	147	100	147
1.4	189	71	134

* Based on good quality silage @ £25/t and concentrates @ £180/t

Source: Basil Lowman, SAC

House finishing cattle quickly to free up grass for other stock and to prevent weight-loss.

- + House finishing cattle quickly to free up grass for other stock and to prevent weight-loss
- + Ensure that buildings are designed to reduce the risk of heat stress, eg good ventilation and drainage. Reduce stocking density if temperature/humidity becomes a problem
- + Recognise that under-feeding heifer replacements may result in liveweight targets not being met (ie, at least 65% of mature bodyweight at first service). This may have consequences for serving age

Management guidelines for sheep

- + In extreme drought situations, wean lambs early and manage the dry ewes and weaned lambs separately. The lambs can be sold as stores, finished intensively or moved to better grazing
- + Ensure dry ewes meet body condition targets for tugging and have been flushed on a rising plane of nutrition to maintain their fertility levels

Table 5: Body condition targets for ewes at key times in the production cycle

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

- + When sward heights are below 4cm, supplementary concentrates will be needed to maintain condition and performance
- + Ensure the nutritional requirements of the rams are being met to ensure they are fit for working
- + Minimise nutritional stress during early pregnancy to reduce the risk of embryo loss and failed implantation
- + Be aware that hungry animals may gorge themselves on supplements such as cereals, which may lead to acidosis. Aim to introduce additional feed before supplies become critical
- + Evaluate all available feed stocks and the cost of weight gain before deciding whether to finish lambs intensively

Table 6: Cost of gaining one kilogram – effects of different levels of concentrate feeding and liveweight gain

Concentrates as % of diet	Daily liveweight gain (g/day)			
	50	100	200	400
0	£1.08	£0.54	£0.27	£0.14
25	£2.30	£1.15	£0.57	£0.29
50	£3.51	£1.76	£0.88	£0.44
75	£4.73	£2.36	£1.18	£0.59

Assuming 35kg lamb consuming 0.9kg of dry matter/day, grass = £60/ tonne fresh weight, concentrates = £212/tonne

- + Be aware that selling bigger lambs (5-7kg from finishing weight) as stores, will provide more grazing for other stock
- + A possible alternative for finishing lambs is to accept lower performance and rely on compensatory growth when more forage becomes available
- + When drought ends, the resulting surge of grass may increase the risk of grass staggers (hypomagnesaemia) and worm control will also be important
- + Investigate the potential of drought-resistant forages, such as chicory, cocksfoot, birdsfoot trefoil, some of which have natural anthelmintic properties

Table 7: Forages that remain productive during drought

Forage species	Analysis	Uses
Chicory	DM = 15% CP = 20% ME = 12 MJ/kg DM	High yielding, high protein crop, but needs to be rotationally grazed
Cocksfoot	DM = 26% CP = 12% ME = 10 MJ/kg DM	New variety with improved palatability is available Good grazing management is needed
Common vetch	DM = 18% CP = 18% ME = 9 MJ/kg DM	Companion fodder crop, grown with cereals or beans
Lucerne	DM = 30% CP = 21% ME = 10 MJ/kg DM	High yielding, high protein crop, which can be rotationally grazed or conserved
Red clover	DM = 30% CP = 21% ME = 10 MJ/kg DM	Can be grazed or conserved Care is needed when grazing with cattle, due to the risk of bloat
Sainfoin	DM = 33% CP = 18% ME = 8 MJ/kg DM	Sown with non-competitive grasses or cereals Mainly used for conservation, but can be grazed
White clover	DM = 30% CP = 21% ME = 10 MJ/kg DM	Variety choice is important, as drought resistance relies on deep taproot Can be grazed or conserved

Notes: Early drilled brassicas will provide forage over a period of drought, as they will not die back. Perennial ryegrass and tall fescue will survive droughts, but will not be productive in dry weather.

DM = Dry Matter, CP = Crude Protein, ME = Metabolisable Energy

Flooding

The threat of flooding is increasing and plans should be put in place to include actions that should be taken before, during and after a flood.

Targets

Identify areas that may flood in an extreme rainfall event.

- + Identify areas that may flood in an extreme rainfall event

Establish an evacuation plan.

- + Establish an evacuation plan

- + Include flood-related diseases in the herd or flock health plan

Management guidelines



Evacuate flood-prone fields early so animals do not become trapped by rising water

During floods, livestock need food and clean water. Be aware that existing stocks and supplies may have become contaminated.

- + Evacuate animals from flood-prone buildings and fields as soon as possible and move them to higher ground
- + Confining animals in a building takes away their ability to protect themselves. However, the decision should be based on the risk of the building flooding
- + The behaviour of animals during stressful events will make handling them more difficult. Well-designed and maintained handling facilities will help
- + During floods, livestock need food and clean water. Be aware that existing stocks and supplies may have become contaminated
- + Account for all stock after the flood. Identify any missing animals and inform neighbours
- + There may be a danger of infectious diseases after a flood, especially when large numbers of animals have been gathered together on wet ground, eg footrot, blackleg, leptospirosis. Ensure vaccinations are up-to-date
- + Clear debris from fields and check fences and gates before turning animals back out
- + Identify areas of grassland or forage that have been damaged by the floodwaters and if necessary, consider re-seeding
- + Clean and disinfect buildings before putting stock back in them
- + Inspect the water supply and feed stocks for contamination and do not feed anything that may be water damaged or potentially contaminated with leaked chemicals
- + Sign up for flood alerts by calling the **Floodline on 0845 988 1188**

Farm disaster kit

Make a disaster kit and place it in a central location. Let all workers know where it is and check the contents regularly.

Make a disaster kit and place it in a central location. Let all workers know where it is and check the contents regularly. This should contain:

- + Current list of all animals, their location and records of feeding and vaccination
- + Contact list – vet, emergency services, Environment Agency
- + Basic first aid kit
- + Animal handling equipment
- + Supplies for temporary identification of animals with farm details
- + Disaster equipment, eg mobile phones, radios and batteries
- + Water, feed and buckets

The leading causes of death during disasters are building collapse, dehydration, electrocution and accidents resulting from fencing failure.

Monitor cattle and sheep health after the danger is over.

Monitor cattle and sheep health after the danger is over

- + Inspect for injuries and treat immediately
- + Watch for signs of diseases, such as pneumonia, footrot, blackleg or leptospirosis
- + Isolate sick animals and seek veterinary advice
- + Make sure all vaccinations are current
- + Use insect repellent products to protect cattle and sheep from increased fly populations

Field layout

- + Look at current gate layouts and consider their effectiveness in the event of flooding, ie are they the lowest point of the field?
- + Consider the likely pattern of flooding and graze fields in the most appropriate sequence to ensure all grass is harvested, eg flood meadows first
- + Fields which incorporate high ground should be as large as possible to allow many animals to gather and allowing them to avoid other hazards, eg floating debris
- + Maintain ditches to ensure rapid run-off after flooding, as excess soil moisture is as damaging as surface water
- + Consider the location of overhead power lines or poles

Watch points for fields post-flooding

- + The damage done by floodwaters will depend on the type of crop, its growth stage, the duration of the flood and the temperature
- + Flooded soil is rapidly depleted of oxygen, which is needed for plant growth and development
- + It is likely there will be changes in the flooded soil's nutritional status, due to leaching and soils being removed or deposited. This may change its texture, pH and the amount of organic matter present. Soil tests will be needed to find out more
- + If the water drains from a field after one or two days there is an increased chance of plant survival. However if it lasts for more than four days, permanent damage is likely

If the water drains from a field after one or two days there is an increased chance of plant survival. However if it lasts for more than four days, permanent damage is likely.



Damaged reseed due to wet conditions

- + Look at the new growth three to five days after the water has drained and compare with a similar un-flooded crop to evaluate the degree of damage
- + If silt deposits are greater than 5cm deep, the need for re-seeding becomes more likely as the existing plants will be weakened. However it may be possible to just re-seed the silted areas rather than the entire field
- + Even if there is little or no sediment, cultivation may still be needed to speed up drying-out and aeration. Note: there is an increased risk of compaction when soils are wet
- + The choice of varieties for re-seeding will depend on the need for feed supply – short or long-term and whether a cover crop is needed first to help improve the soil
- + It is likely that weeds will take advantage of weakened crops caused by flooding, in the year of the flood and in subsequent years

For more information:

For more information contact: Better Returns Programme

AHDB Beef & Lamb
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel: 024 7647 8834

**Email: brp@ahdb.org.uk
beefandlamb.ahdb.org.uk**

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Any enquiries related to this publication should be sent to us at AHDB Beef & Lamb, Stoneleigh Park, Kenilworth, Warwickshire CV8 2TL.



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