Solving the Problem of Heat Stress in Sheep

Crown Copyright - This document is subject to Crown copyright protection & has been reproduced under licence from the controller of HMSO. The user may not supply copies to third parties nor publish / sell this material to others without written consent of the Controller.

The ADLib Version - This document has been reproduced in full & the technical content is the same as the original. Presentation may vary from the original. Links in this document may take the user to publications other than those produced by government departments & agencies. Where this is the case the background colour of the document will change to white.

Contents

- Introduction 2
- What is heat stress? 3
- When does heat stress occur in sheep? 4
- How to avoid heat stress 7
- Further advice and information on farm animal welfare 9
Introduction

This booklet is intended to describe the main causes of heat stress in sheep and to outline some of the common sense management measures that will help to prevent it.

Heat stress is not a problem under normal conditions in the British climate but it can pose a significant risk to the welfare of sheep under some circumstances. For example, heat stress can occur when sheep are housed, when they are driven excessively in hot conditions and when they are confined on road transporters. When it does occur it causes suffering to the animals involved and renders them more susceptible to other disease conditions. Not only is there a welfare cost to the sheep but there is also a reduction in flock productivity and profitability.

This booklet discusses some of the key principles involved in preventing heat stress in sheep. Whilst it embodies much of the latest advice and the best current husbandry practices, it cannot be exhaustive and is not intended as a substitute for expert advice. If in doubt about a problem, expert advice should be sought.
What is heat stress?

The body temperature of sheep must remain within narrow limits otherwise they will show signs of distress. There has to be a balance between body heat production and body heat loss. If sheep are unable to achieve this balance and are unable to lose sufficient heat, their body temperature will rise and they will become heat stressed.

The main indicator of heat stress is continued panting, even when the animal is standing still. If the animal's body temperature continues to rise it will eventually collapse and die.
When does heat stress occur in sheep?

Under normal circumstances outdoors, sheep can maintain their body temperature within a safe range, known as the thermoneutral zone, without any problems. The fleece insulates the sheep's body, helping to maintain a constant body temperature by providing protection from the extremes of cold in winter and heat in summer.

The role of the fleece in the development of heat stress cannot be overstated. A sheep with a thick fleece is relatively immune to changes in ambient temperature due to the thick insulating layer surrounding its body. However, if body heat production is suddenly increased (for example, due to muscle activity when the animal is driven) it can have difficulty in losing sufficient heat to maintain a constant body temperature and may become heat stressed.

Conversely, a sheep which has been shorn is susceptible to extremes of climatic temperature and can easily become either cold stressed or heat stressed if exposed to extreme weather conditions.

Management plays an important in safeguarding the welfare of sheep in these differing circumstances. The imposition of management procedures on to the flock, such as shearing, gathering, housing or transport can increase vulnerability to heat stress. These are discussed in the following paragraphs.

Housed Pregnant Ewes

Outdoors the ewe is able to move to find shelter from either cold or hot conditions. Her fleece is an excellent insulator, which means that she is rarely cold, providing she stays dry. Conversely, when housed she is no longer in control and is unable to choose the most comfortable environment. We must therefore provide the correct conditions for housed ewes. This includes good ventilation without draughts, adequate space allowance per ewe and dry bedding to avoid excessive humidity.

Ewes which are housed in winter in full fleece are frequently under some heat stress, evident from their increased respiration rate. The results can be quite serious:

- Reduced voluntary food intake - ewes under heat stress are lethargic and have a reduced appetite. In late pregnancy any reduction in feed intake below the optimum can quickly result in pregnancy toxaemia and / or hypocalcaemia. This is particularly true when there are rapid changes in weather conditions from cold and windy to still, warm, muggy days during January and February.
- Increased lamb mortality - where ewes are under moderate heat stress for prolonged periods the result may include a reduction in lamb birth weights and milk yields, both of which contribute to increased peri-natal mortality.
- Respiratory disease - heat stress in pregnant ewes can not only cause direct mortality, but may also increase the risk of pneumonia.

Recently, it has become more common to shear housed ewes in winter. This allows higher stocking rates and has shown to lead to increased birth weights of lambs. However, it is important to remember that shearing deprives the ewe of the insulation provided by the fleece and whilst reducing the risk of heat stress will make the ewe more susceptible to cold stress and energy deficiency in adverse conditions. It is important that winter-shorn ewes are not exposed to draughts or rain. They should not be turned out within two months of
shearing, and even then only in suitable weather conditions and where there is adequate shelter.

Housed Store Lambs

Store lambs are often housed for finishing around the turn of the year, having been outdoors on roots, beet tops or other fodder crops which involve wet conditions and minimal shelter. When suddenly rounded up, wormed and housed, they can be put under considerable stress, some of which will be due to overheating. Research has demonstrated that shearing lambs at housing increases feed intakes, daily liveweight gain and feed conversion efficiency and reduces vulnerability to heat stress. Lambs shorn at housing should, however, be sold on a dead-weight basis (a small deduction will be made for lack of fleece). This is because the cold stress associated with a live market may result in suffering and buyers appear to be prejudiced against shorn animals.

Providing adequate space allowance per ewe is sound management and will reduce the risk of heat stress.

Gathering

Severe heat stress can occur when sheep are driven long distances, for example, from high communal grazing for purposes such as vaccination, dipping and shearing. The flock should be moved at a reasonably gentle pace particularly if the ground is rough. The stress of movement from high to low ground often gives rise to outbreaks of disease such as pasteurolosis and heat stress is undoubtedly a contributory factor in the summer months.

Shearing

Always remember that the fleece protects sheep from extremes of temperature, both hot and cold.
Early-lambing ewes which are shorn in November at housing need shelter in the summer and may even need to be shorn again in May or June to avoid heat stress over the summer months, particularly if there is a need to gather them frequently. Not only does heat stress cause suffering but it may significantly reduce conception rates at tupping which takes place in July in these flocks.

In very hot weather in early May, ewes waiting to be shorn at the normal time may also become heat stressed if moved and it is essential that shade is available. When shearing in hot weather, ewes should be brought into the shearing area in small batches, allowing a period of rest before shearing. Considerable stress, including heat stress, may be imposed on sheep when driven from the pasture to the collection area. This can predispose them to disease such as pasteurellosis which sometimes breaks out one to two days after shearing.

Newly shorn sheep must have access to shade as they no longer have the protection of the fleece.

**Rams Outdoors**

Rams can be heat stressed during the summer months. They should always be shorn in the early summer and provided with shade and water. Heat stress reduces libido and can cause sperm damage, reducing fertility which will affect flock production.

This can be a particular problem in synchronised, early-lambing flocks where rams are expected to serve large numbers of ewes over a short time. In these circumstances, remove excess wool from the scrotum at least 6 weeks before mating begins; always provide shade and consider housing the rams during the hottest part of the day so that peak mating activity is in the early morning and / or evening.

**Transport**

Heat stress during transit is common and deaths sometimes occur. The single most important factor is ventilation. The transporter should have adequate ventilation inlets and the animals should have plenty of space above their heads to allow free circulation of air throughout the body of the vehicle.

Remember that the stationary vehicle poses a particular risk to the animals. The internal temperature will quickly rise once the air flow, due to vehicle movement, ceases. A stationary vehicle should never be left in direct sunlight for more than a few minutes.
How to avoid heat stress

In Buildings

- Check that the ventilation in sheep buildings can cope with all conditions, but particularly mild, still days. Allow for extra inlets if necessary, but these must be of draught-free design.
- Do not over-stock. Allow 1.0m² minimum floor area for a half-bred ewe. Keep group size to 30 - 50 ewes. Store lambs (25 - 35 kg) require 0.6 - 0.7 m².
- Provide fresh, clean water at all times, allowing one bowl per pen with a capacity of 5 litres per ewe, per day. Pipes must be well lagged to prevent freezing and bowls sited to avoid soiling with bedding.
- If the building is prone to heating, consider winter shearing or reduce the stocking rate. However, sheep should not be shorn if they are to be housed for less than 8 weeks or if they are to be turned out before late March (lowland) or later in upland areas.
- Feeding housed ewes outdoors should be avoided because some days they will get wet leading to high humidity in the building. Do not house wet sheep. Ensure adequate drainage and bedding to keep the lying area dry.
- When sheep are brought home for housing, allow plenty of time so that they are not stressed and panting when put into their pens. Do not house wet, muddy store lambs straight off roots or similar crops. Allow them to dry off and settle first.
- Consider shearing indoor store lambs if heat stress becomes a problem but remember that there may be a penalty when marketing.

Outdoors

- Provide shade (but watch for fly problems) and an easily accessible water supply for ewes during the summer. Handle them as little as possible. If it is necessary to move the flock during periods of hot weather, only do so in the early morning or evening and do not drive hard.
- Make sure rams working during the summer are shorn and have shade and water. Consider resting them indoors during the hottest part of the day.
Transport

- Only load animals at the cooler times of day. Do not overstock and ensure adequate head room.
- Keep the vehicle moving as much as possible and do not park in direct sunlight.
Further Advice and Information on Animal Welfare

For general advice on all veterinary matters, consult your private veterinary surgeon.

**Heats Stress:**
Further general advice on heat stress may be obtained from:
- The State Veterinary Service (local Animal Health Office - address and telephone number in your local telephone directory)
- Your local ADAS advisor or other expert consultants, equipment manufacturers or suppliers.

A list of publications on animal welfare from Defra is available on their Internet site at www.defra.gov.uk.

If you would like any further information or advice relating to this code please contact DEFRAs Animal Welfare Division on 020 7904 6512.

DEFRA (Department of Environment, Food and Rural Affairs). Further copies of this publication are available from: Defra Publications, Admail 6000, London, SW1A 2XX, Tel: 0845 955 600.

(C) Crown Copyright ~2000 PB2111
Reproduced for ADLib under Licence Feb 2004.