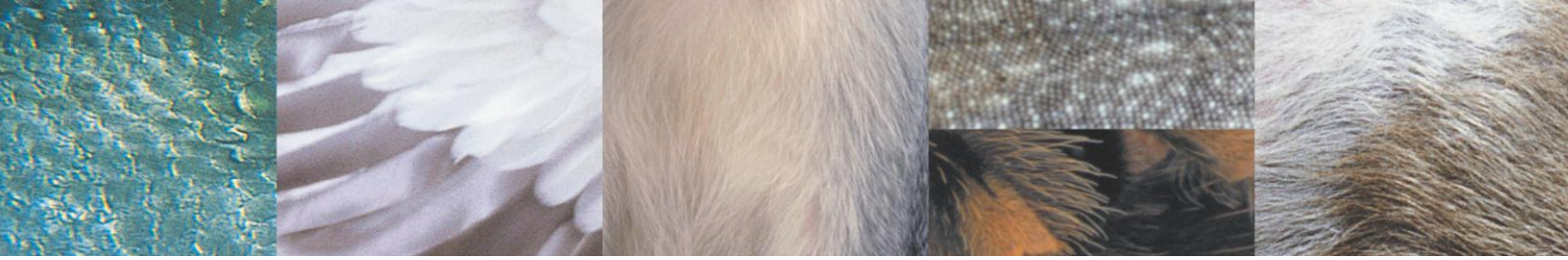

Supplementary resources for members of local ethical review processes

Sheep: Good practice for housing and care

Research Animals Department, RSPCA

4th edition - August 2011

Before using these guidance notes, please read the introductory sheet that accompanies this series:
Supplementary resources for lay members: an introduction

Natural history

Sheep have evolved to live in a varied and changing environment, where they are continually on the move in order to find enough food to satisfy their nutritional requirements. Typically they spend 8 to 10 hours per day grazing, travelling several kilometres whilst doing so. As with many other prey species, they are naturally fearful and apprehensive animals and will flock together at any sign of danger.

Domestic sheep (*Ovis aries*) live and feed in social groups, establishing well defined and stable relationships with other group members. There is a hierarchy within the group, with dominance determined by age, sex, and size. Individuals have established roles within the group; for example, when moving from place to place, certain animals will take the lead with the remainder of the flock following behind. Faces have a particular emotional significance for sheep - showing animals pictures of sheep faces when they are isolated has been shown to reduce stress. They are able to recognise (and remember) at least 50 different individual sheep faces.

Free ranging individuals will always attempt to maintain constant visual contact with at least one other member of the flock. This safeguards the unity of the flock and ensures a fast reaction to predators or any other fear-provoking stimuli.

What sheep need

The most species-appropriate 'housing' for sheep is a well-managed field. However, research programmes may necessitate the housing of sheep indoors and in such instances, the method of both housing and handling must take into account the animals' social, yet wary, nature.

The following list of sheep needs and preferences has been defined on the basis of published studies on sheep behaviour and welfare. The basic needs of all sheep are the same but different breeds may differ in their exact preferences. More information on welfare and suitable environmental conditions can be found in the references listed at the end of this document. The UFAW handbook chapter on sheep is particularly good [1].

- **Social housing**

Sheep are gregarious animals and separation is so stressful that individual animals show both altered physiology and stereotypic behaviours when isolated from others. Female and juvenile animals should therefore always be kept in groups, so that if one animal is removed for any reason, the remaining animals are not left alone.

There can be problems keeping rams together in confined areas, because they can be aggressive to each other. However, they can sometimes be group-housed if they have been together since they were juveniles and they are known to be compatible. They will need sufficient space to minimise aggressive interactions and their behaviour should be closely monitored. During the breeding season, rams may become distressed if housed so that they can see or smell ewes, so housing arrangements should take this into consideration.

Lambing ewes and their offspring should be kept in lambing pens with plenty of comfortable bedding until the lamb-ewe bond is established. Lambing ewes prefer to distance themselves from other sheep, and so pens should be of sufficient size to allow them to get away from each other.

If there is compelling scientific or veterinary justification for single housing, then this should be for the minimum possible period and animals should be able to see, hear and smell other sheep (although note the above comment about rams). If this is not possible, they should at least be able to see pictures of sheep faces as there is evidence that this may relieve stress [2].

- **Pens of adequate size and complexity**

Free-ranging sheep cover a daily range of up to 40 hectares and so the ability to move about is important. Indoor enclosures should be spacious enough to allow free movement and provide sufficient room for subordinate individuals to distance themselves from dominant ones if necessary. Any temporary individual housing should provide, as a minimum, enough room for the animal to turn around, take at least a few steps in any direction and lie down comfortably.

Providing physical barriers (*e.g.* straw bales) makes pens more complex and provides refuges which facilitates group-housing. Straw bales also enable lambs to climb and jump.

- **Suitable floor with litter material**

Sheep require access to a comfortable, dry resting area with sufficient space for all animals to lie down at the same time. The floor should be solid rather than slatted, and comfortable litter should be provided in the form of straw or coarse sawdust/wood shavings. Litter should be topped up regularly to ensure animals remain dry and so prevent discomfort and the development of foot problems. Where a solid floor is impractical, a perforated floor with a small bore for drainage is acceptable, if sufficient straw bedding is provided on top.

- **A stable diet that provides sufficient fibre**

Sheep need to ruminate, which requires a diet of sufficiently bulky food with an overall fibre content of at least 40%. Offering supplementary hay with pre-formulated feed should ensure adequate fibre intake. Too little fibre, or fibre of an inappropriate form (*e.g.* chopped too short) may result in digestive problems as well as stereotypic behaviours such as bar chewing and wool pulling.

Sheep will only sample new food items cautiously and may well refuse to eat an unfamiliar food in any quantity. Sudden changes in diet, arising from either changes in management or for scientific purposes, can make them reluctant to eat and may also result in clinical problems like bloat and acidosis that are related to the effect of dietary changes on gut bacteria. Any dietary changes should therefore be introduced gradually.

Sheep naturally spend a significant proportion of their time foraging in a varied environment, eating a range of different foods, and it is important to provide environmental enrichment that allows expression of this natural behaviour. Where animals are housed indoors, natural feeding behaviours can be encouraged by placing root vegetables in straw litter.

- **Well designed feed troughs**

Unless feed is available on an unrestricted basis, there should be sufficient trough space to allow all animals to feed at the same time without competition. Feed troughs should not have any sharp edges or corners, and should be shallow enough to allow animals to maintain visual contact with each other whilst eating.

- **Appropriate lighting**

Sheep housed indoors need periods of light and dark over a 24-hour period to reflect natural light rhythms. They are fearful of sharp lighting contrasts and are reluctant to move from bright to dark areas and vice versa. Consequently a light source that produces uniform illumination without the production of dramatic shadows is preferred.

- **Acclimatisation to new environments**

Novelty is an acute source of stress for sheep and any significant change in their surroundings can make them apprehensive and fearful. In particular, a transition from an outdoor field environment to laboratory conditions is potentially extremely stressful. The transition process needs to be well managed, for example, pre-feeding the laboratory diet in the field, training the animals for confinement (*e.g.* in pens), and separating them into their anticipated social groups. Animals will then require an appropriate period of acclimatisation, coupled with positive and sympathetic handling, prior to any procedures.

- **Human interaction**

Humans can be seen as predators by sheep and this can elicit particularly strong fear responses that may be expressed by a range of behaviours including foot stamping. In addition, sheep have an excellent memory for aversive experiences and do not readily overcome their fears if they are reinforced by any procedure that causes pain or distress. This can only be overcome by regular contact with knowledgeable and patient personnel, who provide compassionate conditioning through firm but gentle handling and familiarisation.

The animals' natural behaviour can be used to help with routine tasks. For example, sheep naturally 'follow the leader' and stress can be reduced by handling them in their own preferred social order, rather than in, say, a numerical order. Handling pens should be properly designed and located to encourage animals to move through the system without force.

As with other species, Positive Reinforcement Training techniques (*e.g.* offering a food reward for a required behaviour) can also help reduce potential stress from husbandry and/or scientific procedures. For example, sheep will voluntarily enter weighing crates and accept brief immobilisation for a grain reward.

Potential husbandry related welfare problems and how to resolve them

Abnormal behaviours include wool pulling and bar or wall licking or chewing. Wool pulling can result in the denuding of subordinate individuals if left unchecked, and may spread to other members of the group. It can be avoided by providing sheep with adequate pen space and complexity, opportunities to escape from dominant animals and by the provision of additional roughage - hay is recommended but straw may also help.

Foot infections such as scald and foot rot are contagious diseases of sheep that can cause severe lameness. Keeping sheep on damp bedding predisposes them to infection. The risk of infection can be minimised by ensuring that feet are regularly inspected, and trimmed if necessary by competent personnel using appropriate equipment, and that animals are housed on dry bedding. Quarantine and treatment of infected individuals is essential to avoid the spread of disease.

Sheep housing and care: ERP aide-memoire

- ❖ Social housing in stable groups appropriate to the sex and age of the animal ❑
- ❖ Provision for any animal housed individually to see, smell and hear other sheep ❑
- ❖ Pens of adequate size and complexity with physical barriers to provide refuges ❑
- ❖ Solid floor with suitable litter and a comfortable, dry resting area ❑
- ❖ A stable diet that provides sufficient fibre and a variety of familiar foods ❑
- ❖ Natural feeding behaviours encouraged by placing food in the litter ❑
- ❖ Well designed feed troughs with sufficient space for all animals to feed simultaneously ❑
- ❖ Uniform lighting which reflects natural light rhythms ❑
- ❖ Appropriate period of acclimatisation to new environments with good management of the transition process ❑
- ❖ Human interaction and handling that takes account of the animal's natural behaviour (e.g. 'follow the leader') with Positive Reinforcement Training techniques incorporated where appropriate ❑

Notes

Recommended references

1. Gilbert CL & Kendrick KM (2010) Sheep and goats. Chapter 34 in: *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*, 8th edn, pp 510-524. Wiley-Blackwell.

2. da Costa AP, Leigh AE, Man AS & Kendrick KM (2004) Face pictures reduce behavioural, autonomic, endocrine and neural indices of stress and fear in sheep. *Proc Biol Sci.* **271**: 2077-2084.

3. Monash University & Animal Welfare Science Centre (2005) Policy on the care and use of sheep for scientific purposes based on good practice. *Sheep Workshop Proceedings, Clayton Victoria, Australia* www.animalwelfare.net.au/comm/download/sheepcare.pdf

4. Reinhardt V & Reinhardt A (2002) Comfortable quarters for sheep in research institutions. In: *Comfortable Quarters for Laboratory Animals*, 9th edn (V & A Reinhardt eds), pp 83-88. Washington DC: Animal Welfare Institute, www.awionline.org
NOTE: the 10th edition of *Comfortable Quarters* is under production at the time of writing.

5. RSPCA (2010) *Welfare Standards for Sheep*. Download at www.rspca.org.uk/sciencegroup/farmanimals/standards/sheep

6. Miller S, Soriano A, Perry B & Wood J (2011) Sheep enrichment. *The Enrichment Record* **8** (July 2011): 12-15. Download at http://enrichmentrecord.com/

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