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(Animals (Scientific Procedures) Act 1986)

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Code of practice for the housing and care of animals used in scientific procedures



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PART 1: 3. Animal care and health

3.1. Animals living within an animal house are totally dependent on humans for their health and well-being. Their physical and psychological state will be influenced by their surroundings, food, water and the care and attention provided by the animal house staff.

3.2. The aim is to maintain animals in good health and physical condition; behaving in a manner normal for the species and strain and with a reasonably full expression of their behavioural repertoire; amenable to handling; and suitable for the scientific procedures for which they are kept.

3.3. **The general well-being of all animals must be checked at least once daily.** More detailed examinations should be carried out with sufficient frequency to ensure that the health and well-being of the animals is maintained. Animals which are undergoing scientific procedures must be inspected at a frequency commensurate with the severity of the procedure.

Responsibility for animals

3.4. Responsibility for the care of laboratory animals which are involved in or held for scientific procedures falls to:

- (i) the **personal licence holder** who is responsible for all animals submitted to procedures under the terms of his or her licence;
- (ii) the **animal technician**;
- (iii) the **person named as responsible for the day to day care** of the animals;
- (iv) the **named veterinary surgeon** (or, in exceptional circumstances, another suitably qualified person) who monitors and advises on the health and welfare of the animals;
- (v) the **project licence holder**;
- (vi) the **holder of the certificate of designation**.

Sources of animals

3.5. Under section 10(3) of the Act, unless an exemption has been issued by the Secretary of State, the following species named in Schedule 2: mouse, rat, guinea-pig, hamster, rabbit and primate-must be obtained from designated breeding or supplying establishments: dogs and cats must be bred at and obtained from designated breeding establishments.

3.6. The importation of animals from overseas is controlled by the Animal Health Act 1981 and, for some species, by the Endangered Species (Import and Export) Act 1976. Details about licences, health certificates, rabies and other quarantine requirements should be obtained from the Animal Health Division, MAFF, or the Department of Agriculture for Scotland (DAFS) and from the Wildlife and Conservation Licensing Section, Department of the Environment (DoE), Bristol. In Northern Ireland, importation is controlled by the Department of Agriculture.

3.7. Many wild animals, including birds, reptiles and amphibians, are protected by

the Wildlife and Countryside Act 1981 (in Northern Ireland by the Wildlife (NI) Order 1985). There is additional statutory protection for badgers, seals, deer and fish. The Dangerous Wild Animals Act 1976 (which does not apply in Northern Ireland) controls the keeping of some animals, including some primates: further information may be obtained from DoE, Bristol.

3.8. Trapping methods (49, 63) must be humane and should be undertaken only by competent people. Any animal that is injured should be given first aid and, if necessary, examined as soon as possible by a veterinary surgeon. If pharmacological restraint is necessary, it should be done under the supervision of a veterinary surgeon or other authorised person. The permission of MAFF may be required.

3.9. If it is necessary to use an anaesthetic or immobilising agent in the capture of large animals, this should be administered by a veterinary surgeon or other authorised person.

3.10. Tranquillising weapons, including blowpipes, are classed as prohibited weapons under the Firearms Act 1968 and may be acquired only on the authority of the Home Office and with a permit from the local Chief Constable. The tranquillising agent may itself be subject to additional control under the Misuse of Drugs Act 1971 (32, 43).

TRANSPORT

3.11. Stress during transport should be minimised by making animals as comfortable as possible in their containers and, if confinement is to be prolonged, by providing food and water. Time in transit should be kept to a minimum (17, 67). Animals that are incompatible should not be transported together.

3.12. The sender should ensure that the animals to be transported are in good health and that their containers are adequately labelled. Sick or injured animals should be transported only for purposes of treatment, diagnosis, or emergency slaughter.

3.13. Pregnant animals need special care. Farm animals should not normally be transported during the last week of pregnancy and small animals in the last fifth of pregnancy.

3.14. Where animals are subject to control under the Act, it is necessary to consult the Inspector about authority to transfer them to other designated premises. Where laboratory animals are to be exported or imported advice should be sought from the Home Office and the local Divisional Veterinary Office of MAFF.

3.15. The advice of the DoE should be sought about the transport of wild animals. Special considerations apply to the transport of fish (31). Farm animal transport is regulated by various orders under the Animal Health Act 1981 and details should be obtained from MAFF.

Reception

3.16. Animals should be removed from their transport containers with the least possible delay. After inspection, the animals should be transferred to clean cages or pens and be supplied with food and water as appropriate. Animals that are sick, injured or otherwise out of condition must be kept under close observation, housed separately and examined by a veterinary surgeon (or other competent person) as

soon as possible.

3.17. A record should be made of animals received, their source and date of arrival as required by section 10(6)(b). Animals should be identified by cage labelling in the case of rodents and other small laboratory animals. In the case of dogs, cats, equidae, primates, farm animals and adult birds, each animal accommodated in the establishment must be readily identifiable. In the case of dogs, cats and primates each animal will need to be identifiable by a method of permanent marking approved by the Secretary of State. If permanent marking is not practicable, e.g. in marmosets, the animal should be fitted with a collar or necklace bearing its number or other identifier.

Acclimatisation and quarantine

3.18. Acclimatisation is necessary for an animal to overcome the stress imposed by transport and subsequent exposure to a new environment with different diet, microflora and a change of human contacts, before subjecting it to scientific procedures. The period of time required will vary according to circumstances and should be determined by the user in consultation with the senior animal technician (28, 35, 56, 58) or named veterinary surgeon.

3.19. Imported animals are subject to statutory control by licences issued by MAFF. A period of quarantine may be given as a condition of the licence and details of the requirements can be obtained from local veterinary officers. The Rabies (Importation of Dogs, Cats and Other Mammals) Order 1974, as amended, specifies a period of quarantine for some animals. Wild-caught animals should be housed separately from laboratory-bred ones to prevent transmission of infection. An acclimatisation period of up to 3 months may be necessary if animals are to be used for breeding.

CARE OF ANIMALS

Animal accommodation

3.20. Building and environmental control have been dealt with in Section 2. This section deals with the space required for each animal. Laboratories should always consult their Inspector before committing themselves to a programme of work to comply with the recommendations contained in this Code as it may be that simple innovations produced in their workshops will prove preferable to new caging in terms of both animal welfare and cost.

3.21. Size, shape and fittings of pens and cages should be designed to meet the physiological and behavioural needs of the animals. The shape of the cage and the furniture provided may be as important to the animal as the overall size of the cage. Social relationships are as important as stocking densities and room must be allowed for growth of the animals. Some animals continue to grow into old age although they may become less active.

3.22. Cage and pen dimensions based on those recommended in the RS/UFAW guidelines (46) are given in Part 2. The height and area recommended are internal, not overall, dimensions. The sizes suggested are broadly in line with the recommendations of the European Convention (20). Where they differ, this is to take account of current British practice.

3.23. The sizes are intended to be used with discretion and indicate standards that

users should seek to achieve and cages below the tabled heights and floor areas may be accepted temporarily at the discretion of the Home Office provided that the welfare of animals is not impaired. However, all new purpose-built housing should at least comply with the stated dimensions from the outset.

3.24. The pens or cages should be made of material that is not detrimental to the health of the animals and which is resistant to cleaning agents and techniques. They should be designed to minimise risk of injury with comfortable floors that permit easy removal of excreta. Floors, walls and doors should have surfaces which are resistant to wear and tear caused by the animals or by cleaning procedures.

3.25. Animals should be housed so that they can be easily inspected: animals should not be held in cages which are stacked so high that they cannot be inspected without removing them from the rack.

3.26. Pens for larger animals should have stable, non-slip floors. If slatted floors are used, design and finish must allow the animals to lie comfortably without injury to legs, feet or udders. Cows housed on slatted floors should have a separate solid floored area with straw or bedding material (38). Farm animals may be kept for scientific procedures in paddocks, yards, etc., which have been designated for the purpose.

3.27. Post-operative recovery pens and cages may be smaller than the sizes suggested. Some procedures may require a more restrictive system of housing to cater for special requirements imposed by experimental procedures, for example, the need to collect excreta or expired air, or the use of radioactive isotopes. Such housing should be used for the minimum time only.

Bedding and nesting material

3.28. Bedding and nesting material should be provided, unless it is clearly inappropriate. It should be comfortable for the particular species, dry, absorbent, dust free, non-toxic and free from infectious agents, vermin and other forms of contamination. Sawdust or shavings should not be derived from hardwoods or wood that has been treated chemically. Nesting materials should provide insulation but cause no hazard to the young or adult animals (65). Where large animals are housed on concrete, cattle mats should be used to protect pressure points.

Food

3.29. Diet should be formulated to satisfy the nutritional requirements of the animals (12). In the selection, production and preparation of food, precautions should be taken to avoid chemical, physical and microbiological contamination. Food should, when appropriate, be packed in sealed bags that are stamped with the production date and, when applicable, the expiry date. Packing, transport and storage should be such as to avoid contamination, deterioration or destruction of food. Perishable foods should be stored in cold rooms, refrigerators or freezers.

3.30. Diets for disease-free animals should be treated to destroy vegetative organisms, parasites, pests and spores. Diets for germ-free or gnotobiotic animals must be sterilised by autoclaving or irradiation (18). Where special diets containing chemicals for testing have been used, the nutritional consequences of the preparation and storage of the diet should be considered. Special considerations apply to the feeding of fish (28).

3.31. All food hoppers and utensils should be cleaned regularly and their sterilisation considered. If moist food is used or if the food is easily contaminated, daily cleaning is essential.

3.32. Where animals are held in groups, care should be taken to ensure that subordinate animals have adequate access to food and water. Consideration should be given to the avoidance of obesity by controlling food intake (23, 62). Where 'withholding of food' is necessary for experimental or safety reasons, such as prior to anaesthesia, care should be taken that 'deprived' animals are not stressed by exclusion from food whilst other animals around them are fed. This may necessitate removal to another cage or room.

Water

3.33. Clean drinking water must normally be available to all animals at all times. It is usually provided in water bottles or other containers or by an automatic system. During transport, it is acceptable in some cases to provide water in the form of a moist diet (39).

3.34. Water is a vehicle for micro-organisms and the method of supply should minimise this hazard, for example by acidification or chlorification. When bottles are used, they should be sterilisable and sufficiently transparent to enable their contents to be observed. They should be wide-mouthed for easy cleaning. If plastic material is used, it should be resistant to leaching and suitable for sterilisation. Caps, stoppers and pipes should also be sterilisable and easy to clean. All bottles and accessories should be dismantled, cleaned and sterilised at intervals. Bottles should be replaced by clean, full ones rather than being topped up in the animal rooms. Water containers should not tip or spill easily.

3.35. The operation of automatic systems should be checked daily. They should be properly serviced and cleaned regularly to avoid malfunction and the risk of spread of infection. The water should be monitored for quality and purity to avoid bacterial contamination. If solid-bottomed cages are used, precautions should be taken to avoid flooding. Emergency supplies should be available in case pipes freeze or supplies otherwise fail.

Water for aquaria

3.36. The successful keeping of fish in the laboratory depends upon maintaining water quality within the range that will allow survival and growth. Uneaten food debris and excretory products must be removed from the tanks. The dissolved oxygen concentration for fish native to Britain should be maintained at least at 5mg/l. When preparing water for salt water aquaria, the specifications are critical (1,3,31,57).

3.37. The tolerance of fish, amphibians and reptiles to changes in pH, chlorine and other chemicals differs widely from species to species. Water quality in aquaria and tanks must take account of these differing needs and tolerance limits.

Exercise

3.38. All animals must be allowed to exercise. For the smaller species, this should usually be achieved by providing adequately sized cages or pens and sometimes play objects. Indoor exercise may be acceptable provided adequate space and time are

made available and it does not disturb other animals. For larger species, special arrangements will usually be required for social contact as well as exercise.

Handling

3.39. The behaviour of an animal during a procedure depends on the confidence it has in its handler. This confidence is developed through regular human contact and, once established, should be preserved. Where appropriate, time should be set aside for handling and grooming. All staff, both scientific and technical, should be sympathetic, gentle and firm when dealing with the animals.

Cleaning

3.40. Regular cleaning and maintenance and a high standard of hygiene are essential for good husbandry. Routines should be established for cleaning, washing, decontaminating or sterilising cages and accessories.

SPECIAL CONSIDERATIONS

Wild animals

3.41. It is important that licence holders are aware of general advice on the care and use of wild animals (9, 49). Animals caught in the wild or being prepared for release back into the wild should be kept in conditions which conform as nearly as possible to their natural habitat in such respects as light intensities, food etc. Treatment for ectoparasites is usually necessary but care should be taken to choose an insecticide and method of application that does not harm the animal or interfere with experimental results.

3.42. The progeny of wild-caught animals may be kept under normal laboratory conditions and fed pelleted diets.

Non-human primates

3.43. The Order *Primates* includes both the 60g mouse lemur and the 200kg gorilla and encompasses a wide range of lifestyles. In considering the provision of a suitable laboratory environment for such a widely diverse group, it is best to work from a thorough understanding of the biological, psychological and behavioural needs of the individual species. Primates have high intelligence, most have arboreal habits and all need complex, stimulating environments.

3.44. The Home Secretary has set out a number of aspects of current policy towards primates in his response to the FRAME/CRAE report, "The Use of Non-Human Primates as Laboratory Animals" (29).

3.45. Housing should be secure and present the minimum hazard to the handlers and to the animals. Within this constraint, it should provide adequate space, complexity (e.g. varied diets, cage furniture) and opportunities for social interaction. Food items such as nuts, grain etc. may with benefit be added to bedding to encourage foraging behaviour and reduce boredom.

3.46. The use of space by primates means that cage volume is important. Virtually all show a vertical flight reaction. Cage height should allow for this and should permit the animals to stand erect, jump and climb, and to sit on a perch without head or tail

touching the cage . Perches and swings may be chewed and will need periodic replacement. No monkey should be housed in a cage which has any dimension shorter than twice its crown/rump length. Cages should have adequate floor space for the more terrestrial species.

3.47. Most species are highly sociable and benefit from being housed with companions and should be so housed that they have opportunity for social interaction. This can be achieved by careful design of single housing, paired or gang-caging systems with access to exercise or play areas whenever possible.

3.48. Single housing should be avoided wherever possible but care should be taken to ensure that animals which are housed together are compatible. Harmonious social groups can often be established even with animals which have been single-housed for many years. In some cases, same-sex strangers or adult/infant pairs are compatible, while in others only opposite-sex strangers can be housed together although this may not be acceptable where breeding is not desired.

3.49. Wherever possible, caging systems should have the flexibility of removable walls to give access to adjacent units. If animals cannot be kept together, cages should be so placed that the animals can see each other for at least some of the time. Intermittent social contact is better than none at all.

3.50. The least distressing method of handling is to train the animal to co-operate in routine procedures. Advantage should be taken of the animal's ability to learn. Young captive-bred well-socialised animals which are familiar with their handlers are the most satisfactory.

3.51. The RS/UFAW guidelines (46) gave examples of cage sizes for the monkeys most commonly kept in laboratories and these are the basis for para 5.5 . The dimensions specified may however need to be adapted to individual requirements. In addition, UFAW, with the support of the Association of British Pharmaceutical Industries, has published a study of the housing and welfare of cynomolgus macaques and baboons (30). Other considerations for the common types are set out below.

3.52. **Arboreal monogamous monkeys** (e.g. common marmoset). A breeding pair will produce twins or triplets every five months and the group should be permitted to increase to 6 to 8 in number. Eldest twins or triplets should be kept together to 15-18 months of age before being paired with unfamiliar partners. New pairs should not be housed in proximity to members of the same family group as this may inhibit breeding. Isolation of more than a few days should be avoided for non-breeding animals, preferably by keeping them in same-sex sibling groups .

3.53. Unfamiliar same-sex animals (even juveniles) should not be put in the same cage as they may fight.

3.54. Cages should include wooden perches, a swing, a wooden nest box, a shelf for feeding and sufficient wood shavings to allow foraging. The animals should have space to jump horizontally from one perch to another.

3.55. **Arboreal polygamous monkeys** (e.g. squirrel-monkeys). A breeding group may consist of two compatible males and 6-8 females. The cage should have two compartments so that the sexes can be kept apart and females giving birth should be able to withdraw from the rest of the group. Sub-adult young can be removed

and kept in gang cages in same-sex groups.

3.56. Non-breeding animals can be kept in same-sex groups. Cage inclusions should be the same as for marmosets.

3.57. **Semi-terrestrial polygamous/promiscuous cercopithecoids** (e.g. macaque and baboon). A recommended breeding group is one male and 1-12 females. Females should have adequate space or means of escape should the male harass them. There should be several entrances to sleeping quarters. Groups should be monitored to check whether any individuals are being intimidated. Several food and water dispensers should be available.

3.58. Non-breeding females can be kept together. Males are highly aggressive and competitive and compatibility should be assured before housing them together.

3.59 Any animal housed individually should be assessed periodically to re-evaluate its social and environmental needs, including whether it has enough space for its size. Special arrangements should be agreed with the Inspector for animals over 9kg.

Rats and mice

3.60. Rats and mice should be group-housed (36) unless a particular experiment requires otherwise (69).

Hamsters and guinea-pigs

3.61. Guinea-pigs do well in floor pens provided care is taken to avoid draughts and plenty of bedding material is supplied. The climbing behaviour of hamsters should be taken into consideration when designing cages.

Rabbits

3.62. Where rabbits are to be held in floor pens, attention should be given to the avoidance of draughts. Floors should be so constructed as to minimise damage to feet and hocks. The entry in para 5.6 is based upon dwarf breeds (under 2kg), Dutch and New Zealand White (up to 6kg) and Flemish Giant (over 6kg). The area recommended is based on cages of up to 50cm deep to allow the animal to lie at full stretch crosswise. Wherever practicable rabbits should be group-housed.

Ferrets

3.63. Ferrets do well when group-housed in escape-proof floor pens provided care is taken to avoid draughts. A small inner compartment to provide animals with darkness and security may be appropriate.

Cats

3.64. Wherever practicable, cats should be housed in social groups. Where they must be housed singly, they should be let out for exercise at least once a day where this does not interfere with the procedure. Cat pens should be equipped with dirt trays, which should be changed at regular intervals. There should also be ample shelf room for resting as well as objects suitable for climbing and claw trimming.

Dogs

3.65. Dogs with permanent access to outside runs should have a sheltered place to find protection against unfavourable weather conditions. Grid floors should not be used unless a procedure requires it. Partitions between pens should be such as to minimise the risk of dogs injuring themselves or each other. All pens should have adequate drainage.

3.66. The minimum floor area for a dog pen should be 4.5 sq m. Two or more dogs may be housed in this area depending on weight. Where one dog is confined in part of this area, it should not be confined for longer than the normal overnight period.

3.67. Compatible dogs may be kept in pairs. Where they cannot be kept in pairs, their pens should be placed so that they can see one another, but there may be a requirement to be able to prevent this for procedural reasons.

3.68. There is always the need for dogs to have regular human contact. Dogs should have access to adequate exercise areas and be able to exercise with other dogs. Staff time should be allocated to encouraging activity during such periods.

Farm animals and equidae

3.69. Where practicable, these animals should be housed within sight of each other. Where horned cattle are housed in groups, more space will be required. Horned and dehorned cattle should not be mixed in the same pen. Pens should be rectangular rather than square. The width of the pen should be not less than the length of the animal from nose to root of tail.

Birds

3.70. Mesh size in grid floors should not be greater than 10 x 10 mm for young chicks, and 25 x 25 mm for growers and adults. The wire thickness should be at least 2 mm. The sloping gradient should not exceed 14% (8 degrees). Water troughs should be of the same length as the feed troughs. If nipples or cups are provided, each bird should have access to two. Cages should be fitted with perches and allow birds in single cages to see each other. Pigeons and finches should be housed in large aviaries wherever possible.

3.71. Special care should be taken when housing chickens and quail in groups to prevent feather pecking. Where large mature birds are housed, the cages should be high enough so that the birds do not touch the top of the cage with their heads.

ANIMAL HEALTH

3.72. Healthy animals are an essential prerequisite for good science. Intercurrent infection in the animal population may call in question the validity of information obtained from scientific procedures and make interpretation of results impossible.

3.73. It is essential that, in consultation with the named veterinary surgeon or other suitably qualified person, plans should be prepared to prevent or deal with possible disease outbreaks. An effective health and disease recording system should be maintained and available for inspection. It should include details of arrivals, departures, treatments and deaths.

3.74. Most laboratory species are purpose-bred and healthy animals of known

microbiological status can be acquired for experimental procedures. Animals from less controlled sources, such as from the wild, may harbour pathogens transmissible to man and other species. Where there is a danger of spreading disease, separation by barrier or quarantine management procedures should be adopted to help reduce risks.

3.75. Animals that are deliberately infected with pathogens should be held at the appropriate containment level in accordance with the recommendations described by the Advisory Committee on Dangerous Pathogens (2). Further information may be obtained from the Health and Safety Executive in Bootle.

Conventional animals

3.76. The term 'conventional' is used to describe animals that are reared with a minimum barrier system and that may carry organisms pathogenic for their own or other species. Disease control in populations of such animals may be achieved by the use of appropriate vaccines or chemotherapy. Individual animals showing signs of disease should be isolated and treated or killed.

3.77 . Animals that may harbour zoonotic agents should be caged, managed and handled in such a way as to minimise any risk of infection being transmitted.

Pathogen-free animals

3.78. Animals free from specified pathogenic organisms require to be maintained in buildings in which filtered air and treated food and water are supplied and where all caging and utensils, etc. are adequately disinfected. Personnel in such units are required to adopt standards of hygiene and wear clothing which prevent them carrying infection to the animals in their care. Access of personnel to such units should be restricted in order to minimise the possibility of introducing infection. Within such barrier-maintained units, physical isolation of separate experimental populations is recommended in order to reduce further the risk of introducing disease. Regular microbiological surveillance is necessary to ensure that the status is being maintained.

3.79. Gnotobiotic animals need complete physical separation from environmental contaminants and isolation techniques are essential (19).

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