

**Chinese University of Hong Kong's basic principles and guidelines for investigators conducting biomedical research involving animals.**

These guiding principles that follow provide a framework for more specific national or institutional provisions. They apply, not only to biomedical research but also to all uses of vertebrate animals for other biomedical purposes, including the production and testing of therapeutic, prophylactic, and diagnostic substances, the diagnosis of infections and intoxications in man and animals, and to any other procedures involving the use of intact live vertebrates.

Because of differing legal systems and cultural backgrounds there are varying approaches to the use of animals for research, testing, or training in different countries. Nonetheless, their use should be always in accord with humane practices. The varying approaches in different countries to the use of animals for biomedical purposes, and the lack of relevant legislation or of formal self-regulatory mechanisms in some, point to the need for international guiding principles elaborated as a result of international and interdisciplinary consultations.

**A. Basic Principles**

1. The advancement of biological knowledge and the development of improved means for the protection of the health and well-being both of man and of animals require recourse to experimentation on intact live animals of a wide variety of species.
2. Methods such as mathematical models, computer simulation and *in vitro* biological systems should be used wherever appropriate.
3. Animal experiments should be undertaken only after due consideration of their relevance for human or animal health and the advancement of biological knowledge. The animals selected for an experiment should be of appropriate species and quality, and the minimum number required to obtain scientifically valid results. Investigators and other personnel should never fail to treat animals as sentient, and should regard their proper care and use and the avoidance or minimization of discomfort, distress, or pain as ethical imperatives.
4. Investigators should assume that procedures that would cause pain in human beings cause pain in other vertebrate species, although more needs to be known about the perception of pain in animals.
5. Procedures with animals that may cause more than momentary or minimal pain or distress should be performed with appropriate sedation, analgesia, or anesthesia in accordance with accepted veterinary

practice. Surgical or other painful procedures should not be performed on unanaesthetised animals paralyzed by chemical agents.

6. Where waivers are required in relation to the provisions of article 7, the decisions should not rest solely with the investigators directly concerned but should be made, with due regard to the provisions of articles 4, 5, and 6, by a suitably constituted review body. Such waivers should not be made solely for the purpose of teaching or demonstration. At the end of, or when appropriate, during an experiment, animals that would otherwise suffer severe or chronic pain, distress, discomfort, or disablement that cannot be relieved should be painlessly killed. The best possible living conditions should be maintained for animals kept for biomedical purposes. Normally the care of animals should be under the supervision of veterinarians having experience in laboratory animal science. In any case, veterinary care should be available as required.
7. It is the responsibility of the director of an institute or department using animals to ensure that investigators and personnel have appropriate qualifications or experience for conducting procedures on animals. Adequate opportunities shall be provided for in-service training, including the proper and humane concern for the animals under their care.

## **B. Guidelines for investigators.**

### **General**

8. Investigators have direct and ultimate responsibility for all matters related to the welfare of their animals. They must act in accord with all requirements of the relevant legislation of the Government of the HKSAR, University by-laws and guiding principles and the HK Code of Practice: Care and Use of Animals for Experimental Purposes (the Code of Practice).
9. The responsibility of investigators extends over all facets of the care and use of animals in projects approved by the AEEC. This responsibility begins when the animal is allocated to the approved project and ends at the time of disposal of the animal.
10. Investigators are responsible for the standard of animal care and use by all other persons involved in the study. They must ensure that the extent of supervision is compatible with the level of competence of each person and the responsibilities they are given.
11. Investigators should consult other experienced scientists, veterinarians, or laboratory animal,

livestock or wildlife specialists when necessary.

12. Before any scientific or teaching activity involving the use of animals begins, investigators must obtain a License to Conducting Experiments (License) from the Department of Health and submit a proposal to the AEEC which demonstrates that the project will comply with the conditions of the relevant legislation of the Government of the HKSAR, University by-laws and guiding principles and the HK Code of Practice: Care and Use of Animals for Experimental Purposes.
13. Investigators must not begin a scientific or teaching activity involving the use of animals before a License is obtained and a written AEEC approval is obtained, and must adhere to any license conditions and requirements of the AEEC.
14. Investigators must ensure that satisfactory arrangements are made for contacting them and other responsible persons in the event of emergencies.
15. Investigators must ensure that the choice of species is appropriate for the purpose of the project. Requirements for known genetic constitution, freedom from specific diseases, documented health, nutritional and environmental histories and other relevant factors should be taken into account.
16. When the definition of the biological status of animals is necessary, investigators must ensure that the supplier can provide adequate proof of definition. Where relevant, species and individual animals should be chosen on the basis that the proposed studies will result in the least pain and distress. In making this decision, all aspects of the biological nature of the animals, including their behavioural characteristics and their cognitive development, should be taken into account.
17. Investigators must ensure that records of the use and monitoring of animals in scientific and teaching activities are maintained.
18. Investigators must inform the AEEC when an approved project is completed or discontinued.
19. The investigator should promptly notify the AEEC of any unexpected or adverse effects which occur during the period of the approved project and which impact on the welfare of the animals.

### **Planning projects**

20. In addition to the information required by the AEEC, the investigator or teacher needs to address the following questions during the planning stages of a project:
21. Is the project justified ethically and scientifically?

22. Can the aims be achieved without using animals?
23. Has the most appropriate species of animal been selected?
24. Are suitable holding facilities and competent staff available?
25. Have all staff been informed of the planned experimental and other procedures?
26. Is the biological status (genetic, nutritional, microbiological, general health) of the animals appropriate?
27. Are the environmental conditions (including caging or pen type, noise, photoperiod, temperature, humidity, ventilation, density of housing, and social structures) appropriate?
28. Are the studies designed so that statistically valid results can be obtained or the educational objectives achieved, using the minimum necessary number of animals?
29. If the scientific or teaching activity could cause the animals any pain or distress, what will be done to minimise or avoid this?
30. What arrangements will be made to monitor the animals adequately?
31. Have any of the studies been performed previously? If so, why should they be repeated?
32. Are there any permits that must be obtained for the importation, capture, use, destruction or release of the animals?

**Conduct of studies including general considerations and limiting pain and distress**

33. Pain and distress cannot be evaluated easily in animals, and therefore investigators must assume that animals experience pain in a manner similar to humans. Decisions regarding their welfare in scientific and teaching activities must be based on this assumption unless there is evidence to the contrary.
34. The investigator must anticipate and take all possible steps to avoid or minimise pain and distress, including:
  - (i) choosing the most humane method for the conduct of the study;
  - (ii) ensuring the technical skills and competence of all persons involved in animal care and use;
  - (iii) ensuring that animals are adequately monitored for evidence of pain and distress;

- (iv) acting promptly to alleviate pain or distress;
- (v) using anaesthetic, analgesic and tranquilising agents appropriate to the species and the scientific or educational aims;
- (vi) conducting studies over the shortest time practicable; and
- (vii) using appropriate methods of euthanasia.

35. The use of local or general anaesthetics, analgesics or tranquilisers must be appropriate to the species, and should at least parallel their use in current medical or veterinary practice.
36. Scientific and teaching activities which are liable to cause pain of a kind and degree for which anaesthesia would normally be used in medical or veterinary practice must be carried out under anaesthesia.
37. Distress can sometimes be avoided or minimised by non-pharmacological means. Before a study begins, animals should be appropriately conditioned to the study environment and procedures, and be familiar with handlers. During and after experimental procedures, appropriate nursing to minimise pain and distress, and to promote the well-being of the animals, must be provided.
38. The monitoring of animals must at all times be adequate to prevent the occurrence, or allow prompt alleviation, of pain or distress.
39. If animals develop signs of severe pain or distress despite the precautions outlined above, they must have the pain or distress alleviated promptly or must be killed humanely and without delay. Alleviation of such pain or distress must take precedence over continuing or finishing the study.

### **Signs of pain or distress**

40. Investigators should be familiar with the normal behaviour of the animal species chosen, be knowledgeable of signs of pain and distress specific to that species, and must monitor their animals for these signs.
41. Animals must be monitored to allow detection of deviations from normal behaviour patterns. Such deviations are often the first indications that animals are experiencing pain or distress. Assessments of change in patterns of sleeping, feeding, drinking, grooming, exploratory behaviour, performance in learning or discriminatory tasks, reproduction or social behaviour should be made.

42. Animals must be monitored appropriately for clinical signs of pain or distress. These may include one or more of the following: aggressive and/or abnormal behaviour (some species may become unduly submissive), abnormal stance or movements, abnormal sounds, altered cardiovascular and/or respiratory function, abnormal appetite, rapid decline in bodyweight, altered body temperature, vomiting and abnormal defecation or urination. Indicators of sustained pain or distress may include loss of body weight, failure to thrive, impaired reproductive ability and reduced resistance to disease.

### **Repeated use of animals in scientific and teaching activities**

43. Individual animals must not be used in more than one study either in the same or different projects, without the express approval of the AEEC. However appropriate re-use of animals may reduce the total number of animals used in a project, result in better experimental design, reduce distress or avoid pain to other animals.
44. When seeking approval for the re-use of animals, the investigator must show the AEEC that either, (i) none of the procedures cause the animals pain or distress; or (ii) the second and subsequent studies produce little or no pain or biological stress to the animals (e.g. modifying diet, taking a succession of blood samples, repeated non-invasive recording procedures) and that the animals have recovered fully from the first study before further procedures are carried out.

### **Duration of scientific and teaching activities**

45. Scientific and teaching activities, particularly those which involve any pain or distress, should be as brief as practicable. AEEC approval must be sought for the continued long-term use of individual animals. The decision to continue must be based on the clinical well-being of the animal and the absence of aversion to the experimental situation.

### **Handling and restraining animals**

46. Animals must be handled only by persons instructed and competent in methods which avoid distress and do not cause injury.
47. The use of restraint devices is sometimes necessary for the welfare of the animal and the safety of the handler. Restraint devices must be used to the minimum extent, for the minimum period required to accomplish the purpose of the study and be appropriate for the animal.
48. Tranquilisers or anaesthetics may aid restraint but may prolong recovery from the procedure. When these agents have been used, recovery of the animals must be monitored.

49. Periods of prolonged restraint should be avoided. Where animals are in prolonged restraint, consideration must be given to their biological needs, including their behavioural requirements, and they must be monitored regularly by a veterinarian or other qualified person not participating in the project. If any ill effects are shown, the animal must be removed from the restraint, or the method modified.

### **Completion of projects**

50. Upon completion of the project, animals must be returned promptly to either normal husbandry conditions or, if appropriate and permitted, to their natural habitat, or be killed humanely.
51. Where practicable investigators should share with other investigators tissue from animals being killed.

### **Humane killing of animals**

52. When it is necessary to kill an animal, humane procedures must be used. These procedures must avoid distress, be reliable, and produce rapid loss of consciousness without pain until death occurs. The procedures should also be compatible with the scientific or educational aims.
53. The procedures must be performed only by persons competent in the methods to be used, or under the direct supervision of a competent person. The appropriate means must be readily at hand.
54. Animals should be killed in a quiet, clean environment, and normally away from other animals. There should be no disposal of the carcass until death is established.
55. Dependent neonates of animals being killed must also be killed or provision made for their care.
56. When fertilised eggs are used, the method of disposal must ensure the death of the embryo.

### **Autopsy**

57. Autopsy should be performed when animals die unexpectedly.

### **Additional considerations**

58. Anaesthesia and surgery must be performed by competent staff with appropriate training and experience. Instruction in surgical or anaesthetic techniques must be under the direct and constant supervision of such persons.

## **Surgery**

59. Surgical procedures must be carried out under appropriate local or general anaesthesia. There must be adequate monitoring for the depth of anaesthesia and of side effects such as hypothermia, and cardiovascular and respiratory depression.
60. The choice and administration of anaesthetic, analgesic and tranquilising agents must be suitable for the species and appropriate for the purpose of the study.
61. When more than one surgical procedure is to be performed the animal must have recovered to good general health between each procedure. Every effort must be made to reduce the total number of procedures and the AEEC must have been informed specifically of the need for more than one.
62. When the animal is not to recover from the surgery, it must be unconscious for the whole procedure, either by continuing the administration of the general anaesthetic or by inducing brain death.
63. When the animal is to recover from the anaesthetic, surgical procedures must conform to accepted standards in human and veterinary practice. Analgesics and tranquilisers must be used when required and their use should parallel that in current medical and veterinary practice.

## **Post-operative care**

64. The comfort of animals must be promoted throughout the post-operative period. Attention should be given to warmth, hygiene, fluid and food intake, and control of infection. The use of analgesics and tranquilisers may be needed to minimise post-operative pain or distress. Care should be taken that animals recovering from anaesthesia do not injure themselves by uncoordinated movements, and that conditions are such that they are not disturbed, attacked or killed by other animals in the same enclosure.
65. Appropriate clinical records must be kept, accessible to all involved in the postoperative care of the animal.
66. Investigators must ensure that adequate monitoring, treatment and care of postoperative animals is provided. They must ensure that they are fully informed of the animals' condition.
67. The duties of all staff must be clearly defined and ways of dealing with emergencies established.
68. Any post-operative animal observed to be in a state of severe pain or distress which cannot be alleviated quickly must be killed humanely without delay.

69. Regular observation of surgical wounds is essential to check the progress of healing. Any problems must be attended to immediately.

### **Implanted devices**

70. Skilled and specialised attention is required in the care of animals following an operation in which monitoring or sampling devices have been implanted, or a fistula created. Regular observation is essential to determine signs of distress, pain or infection, which must be treated immediately.

### **Neuromuscular paralysis**

71. Neuromuscular blocking agents must not be used without adequate general anaesthesia or an appropriate surgical procedure which eliminates sensory awareness. Immobilisation of an animal solely with a neuromuscular blocking agent is not acceptable. When these agents are used with an anaesthetic, special care must be taken to ensure the maintenance of an adequate plane of anaesthesia. Since criteria such as the character of respiration and corneal and flexor withdrawal reflexes cannot be used, continuous or frequent intermittent monitoring of physiological variables such as heart rate, blood pressure, pupil size and the electroencephalogram is necessary, together with the effects on these of mild sensory stimuli. Care is required to ensure that drugs used during procedures do not interfere with this monitoring.

### **Animal models of disease**

72. The scientific validity of animal models of human diseases rests in part on how closely they resemble a particular disease. Thus the attendant pain and distress of the human diseases may also occur in the animal. Special care must be taken in selecting the appropriate species and the investigator must accept responsibility for ensuring that any pain or distress is minimised and that the AEEC is informed of the potential effects of the disease on the animals. The use of painful, distressful or lingering death as an end-point in these studies must be avoided wherever possible.

### **Modifying animal behaviour**

73. Procedures used to modify an animal's behaviour or to induce it to perform specific tasks depend on motivating the animal. The preferred inducement is positive reinforcement, but the inducement may be some form of biological stress. This stress should be as mild as possible. Severe water, food, social or sensory deprivation must not be used. Painful or noxious stimuli must be limited to those which do not distress human beings, and must be used for the minimum time necessary. Behaviour can usually

be modified using procedures that involve no more than a physiological stress, e.g. thirst within the range of the normal experience of the species.

### **Toxicological studies**

74. Investigation of the safety of agents intended for use in human beings, animals, the household or the environment, or of naturally occurring toxins, should be performed by persons with appropriate training. If suitable non-animal tests are available, they must be used. In particular, *in vitro* methods should be used as an initial screening test wherever possible.
75. The end-point of such studies must be as early as is compatible with reliable assessment of toxicity, and must minimise the extent of any pain and distress.
76. Investigators must not allow scientific activities to proceed to the painful or distressful or lingering death of animals unless no other experimental end-point is feasible and the goals of the study are the prevention, alleviation, treatment or cure of a life-threatening disease or situation in human beings or animals.
77. When death is essential as the end-point, the study must be designed to result in the deaths of as few animals as possible.

### **Scientific activities involving hazards to humans or other animals**

78. Hazards may arise from sources including viruses, bacteria, fungi, parasites, radiation, radioactivity, corrosive substances, toxins, allergens, carcinogens, recombinant DNA, anaesthetic gases and physical injuries.
79. Any potential pathogenic effects of these hazards when used in studies must be explained as far as possible to all staff. Tests before, during and after the study may be required for staff.
80. The investigator must obtain the advice of the USEO and he must show the AEEC and Director of LASEC that the advice of the institution's biohazards committee has been sought and that appropriate measures for containment, disposal and decontamination have been established.
81. Animals being administered infectious organisms cannot be used in LASEC.
82. The end-point of studies involving hazardous agents should conform to the requirements for toxicological studies.

83. Precautions, security and emergency plans to contain hazardous agents must be appropriate to a 'worst-case' situation.

#### **Animal welfare and animal health research**

84. When studying ways of improving the health or welfare of animals, investigators may need to design studies that replicate the problem such as injury, trauma, nutritional disorder, physical exertion, disease or environmental stress. Thus, the attendant pain or distress may also be replicated. When such studies are necessary, the investigator must ensure that:
- (i) the principal aim of the project is to improve animal welfare or health;
  - (ii) alternative methods are not possible, such as the use of animals already subjected to the problem;
  - (iii) all possible steps are taken to minimise any pain or distress; and
  - (iv) the end-points of studies conform to the requirements for toxicological studies.

#### **Experimental manipulation of animals' genetic material**

85. All work involving the introduction of foreign DNA into mammalian cells or whole animals must be conducted in accord with guidelines issued by the USEO and the relevant biohazards committee of the institution.
86. All proposals to manipulate the genetic material of animals, their germ cells or embryos must also be submitted to an AEEC for approval.
87. The manipulation of the genetic material of animals has the potential to affect the welfare of the animals and their offspring adversely. Investigators must inform the AEEC of the known potential adverse effects on the well-being of the animals.
88. The clinical status of animals in which the genetic material has been manipulated experimentally must be monitored for unusual or unexpected adverse effects. Investigators must report such effects to the AEEC.

#### **Experimental induction of neoplasia**

89. The site for induction of tumours (neoplasia) must be chosen carefully. Subcutaneous, intradermal and flank sites should be chosen when possible. Footpad, brain and eye sites must not be chosen unless there is no alternative.

90. Investigators must monitor their animals closely for signs of pain or distress, especially sudden changes in body weight.
91. Animals with experimentally induced tumors must be killed humanely before predictable death occurs, cachexia becomes advanced, or the tumor becomes large enough to cause ulceration or severe limiting of normal behaviour.
92. With ascitic tumors, including hybridomas, investigators must ensure that the volume of ascitic fluid does not cause gross abdominal distension, and the volumes of solid tumors and cachexia do not become distressful to the animals.
93. In tumor therapy studies, the end-points chosen must be as early as possible, compatible with reliable assessment of the therapy. Weight changes must be monitored closely. Death from the tumor must not be chosen as an experimental end-point.

#### **Lesions of the central nervous system**

94. Anatomical or chemical lesions of the central nervous system have been widely used to study its structure and function in health and disease. These studies demand special consideration when the lesion produces loss or impairment of limb or trunk movements, loss of sensibility to touch, temperature or pain, impairment of the animal's awareness of its surroundings or impairment of appetite or thirst mechanisms. Special animal care, caging, and other facilities may be needed, and the AEEC, in approving such studies, has a particular responsibility to ensure that these facilities are available and that the condition of the animals is closely monitored.

#### **Withholding food or water**

95. Studies involving the withholding or severe restriction of food or water should produce no continuing detrimental effect on the animal. In these studies, the fluid balance and/or body weight must be monitored, recorded and maintained within the limits approved by the AEEC.

#### **Fetal experimentation**

96. When fetal experimentation or surgery compromises the ability of the neonate to survive and be without pain or distress, it must be killed humanely before or immediately following birth unless such pain or distress can be relieved.
97. Unless there is specific evidence to the contrary, investigators must assume fetuses have the same

requirements for anaesthesia and analgesia as adult animals of the species.

98. During surgery of the mother, consideration must be given to any special requirements for anaesthesia of the fetus.
99. Eggs must be destroyed before hatching, unless hatching is a requirement of the study. The AEEC must approve the arrangements made for the hatchlings.

#### **Research on pain mechanisms and the relief of pain**

100. In studies in which unanaesthetised animals are to be subjected to stimuli designed to produce pain, investigators must:
  - (i) ensure that these stimuli limit pain at all times to levels comparable to those which do not distress human beings;
  - (ii) ensure that the animals are exposed to the minimum pain necessary for the purpose of the procedure; and
  - (iii) provide treatment for the relief of pain, or allow self-administration of analgesics, or escape from repetitive, painful stimuli, when possible.

### **C. Guidelines for the acquisition and care of animals in breeding and holding areas**

101. Animals should be obtained from breeding and supply facilities which maintain conditions consistent with this Code of Practice or relevant industry Code. There are a number of requirements governing the import, capture, handling and transport of animals. It is the responsibility of the investigator to consult the Director of LASEC and the relevant authorities of the Government of the HKSAR to ensure compliance with all requirements.

#### **Transport of animals**

102. Transportation can cause distress due to confinement, movement, noise and changes in the environment and personnel.
103. The extent of any distress will depend on the animals' health, temperament, species, age, sex, the number travelling together and their social relationships, the period without food or water, the duration, the mode of transport, environmental conditions, particularly extremes of temperature, and the care given during the journey.
104. The conditions and duration of the transport must ensure that the health and well-being of the animals are not unduly compromised.
105. Potential sources of distress should be identified and steps taken to avoid or minimise their effects on the animals.
106. Containers must be escape and tamper-proof, there must be adequate nesting or bedding material and animals must be protected from sudden movements and extremes of climate.
107. Food and water must be provided when necessary.
108. Transport by air should be in accord with IATA regulations and domestic transport of livestock must be in accord with the relevant Codes of Practice.
109. Both the suppliers and recipients of animals must ensure that there are satisfactory delivery procedures, with animals received by a responsible person.

#### **Admission of new animals into holding areas**

110. When new animals are being admitted into animal holding areas, they should be evaluated, treatment

instigated if required, and their suitability for the proposed studies assessed. This period should allow their acclimatisation to the holding facility and staff.

111. Animals which do not adapt satisfactorily to their new environment should not be kept.

#### **Care of animals in holding and production facilities**

112. Facilities include the buildings, yard or paddocks in which animals are kept.
113. Investigators must consult with the Director of LASEC to ensure that facilities are appropriately staffed, designed, constructed, equipped and maintained to achieve a high standard of animal care and fulfill scientific requirements. The investigator must confirm to the AEEC that these standards are being met
114. The design and management of facilities will depend on the type of animals to be kept and the studies to be undertaken. The overall condition and management of facilities must permit effective maintenance and servicing and be compatible with maintaining the animals in good health.

#### **Outdoor holding areas**

115. These must be compatible with the needs of the species, provide adequate shelter and water, protect the animals from predation and meet other species specific needs.

#### **Indoor housing**

116. Buildings should be compatible with the needs of the animals to be housed, and the studies undertaken. Facilities for free movement and group contact are especially important for some species of animals.
117. Buildings should be designed and operated to control environmental factors appropriately, to exclude vermin and to limit contamination associated with the keeping of animals, the delivery of food, water and bedding, and the entry of people and other animals.
118. Buildings must be maintained in good repair. Walls and floors should be constructed of durable materials that can be cleaned and disinfected readily.
119. Buildings must be kept clean and tidy, and operated to achieve the effective control of vermin.
120. There must be adequate storage areas for food and equipment.

121. Detergents, disinfectant, deodorants and pesticides may contaminate the animals' environment and choice of agents should be made in consultation with investigators.
122. There should be a reticulated water supply and proper facilities for drainage, if appropriate.
123. There must be adequate contingency plans to cover such emergencies as the breakdown of lighting, heating or cooling.
124. Precautions should be taken against the entry of unauthorised persons.

### **Environmental factors**

125. Animals must be provided with environmental conditions which suit their behavioural and biological needs unless otherwise approved by the AEEC for the purposes of a project.
126. Air exchange, temperature, humidity, light and noise should be maintained within limits compatible with the health and well-being of the animals.
127. Effective ventilation is essential for the comfort of animals and the control of temperature, humidity, and odours. Ventilation systems should distribute air uniformly and achieve adequate air exchange.
128. Noxious odours, particularly ammonia, must be kept to a level compatible with the health and comfort of the animals and staff. The adequacy of the ventilation system, the design, construction and placement of cages and containers, population densities both within cages and within a room, the effectiveness of the cleaning and the frequency of bedding changes, will all influence the level of noxious gases. Attention should be given to the balance between the need for cleanliness and the potential impact of cleaning procedures on the animals.
129. These environmental factors potentially affect the welfare of the animals and may affect the results of scientific and teaching activities. Investigators should be informed in advance of planned changes to the environmental conditions of their animals.

### **Food and water**

130. Animals must receive appropriate, uncontaminated and nutritionally adequate food according to accepted requirements for the species. The food should be in sufficient quantity and of appropriate composition to maintain normal growth of immature animals or normal weight of adult animals and the requirements of pregnancy or lactation. Consideration should be given to providing variety in the composition and presentation of food. Uneaten perishable food should be removed promptly unless

contrary to the needs of the species.

131. Drinking water should be constantly and reliably available, and be clean, fresh and uncontaminated.
132. Variations to these requirements as part of a study design must receive prior AEEC approval.

### **Pens, cages and containers and the immediate environments of the animals**

133. Animal accommodation should be designed and managed to meet species specific needs. Pens, cages and containers should be constructed and maintained to ensure the comfort and well-being of the animals. The following factors should be taken into account:
  - i. species-specific behavioural requirements, including the availability and design of space to enable free movement and activity, sleeping, privacy, and contact with others of the same species;
  - ii. provision of single housing for animals when it is appropriate for the species and if necessary for the purpose of the study, e.g. during recovery from surgery or collection of samples;
  - iii. species-specific environmental requirements such as lighting, temperature, air quality, appropriate day/night cycles and protection from excessive noise and vibrations;
  - iv. the need to provide ready access to food and water;
  - v. the need to clean the pen, cage or container;
  - vi. protection from spread of pests and disease;
  - vii. requirements of the study; and
  - viii. the need to observe the animals readily.
134. Pens, cages and containers must:
  - i. be constructed of durable, impervious materials;
  - ii. be kept clean;
  - iii. be maintained in good repair;
  - iv. be escape-proof;

- v. protect the animals from climatic extremes;
  - vi. not cause injury to the animals;
  - vii. be large enough to ensure the animals' well-being; and
  - viii. be compatible with the behavioural needs of the species.
135. The population density of animals within cages, pens or containers and the placement of these in rooms must be such that acceptable social and environmental conditions for the species can be maintained. Where it is necessary to individually house animals of a species which is normally kept in a social group, the conditions should be managed so as to minimise the impact of social isolation. Animals should be housed in these circumstances for the minimum time necessary.
136. Bedding and litter must be provided if appropriate to the species, and should be comfortable, absorbent, safe, non-toxic, able to be sterilised if needed, and suitable for the particular scientific or educational aims. Pregnant animals must be provided with nesting materials where appropriate.
137. The AEEC and relevant investigators should be informed in advance of planned changes to these conditions, since these may affect the welfare of the animals and the results of the scientific and teaching activities.

#### **Routine husbandry procedures**

138. Husbandry procedures which are not part of an approved project (e.g. clipping coats and nails, vaccinations) must be performed by competent personnel.
139. Routine husbandry procedures on livestock should be carried out in accord with relevant Codes of Practice and legislation.

#### **Identification of animals**

140. Animals must be identified by a method such as tattoo, neckband, individual tag, electronic numbering device, physical mark, or by a label or marking attached to the cage, container, pen, yard or paddock in which the animals are kept.
141. The person-in-charge of the facility is responsible for ensuring that animals are identified before allocation to an approved project, after which time both the person-in-charge and the investigator are responsible.

142. The method of identification should be reliable and cause the least stress possible.

### **Disposal of animal carcasses and waste**

143. Appropriate provision must be made for prompt and sanitary disposal of animal carcasses and waste material in accord with the requirements of the Government of the HKSAR and community standards.

### **Management and staff**

#### **Person-in-charge**

144. Animal acquisition, breeding and holding facilities must be supervised by persons with appropriate veterinary or animal care qualifications or experience.
145. The person-in-charge should be responsible for the management of the day-today care of the animals in holding and breeding facilities and for supervising the work of other staff in the facility, and should act as liaison between the investigator and facility staff.
146. The person-in-charge should ensure that there is reliable monitoring of the wellbeing of all animals by other staff, and be knowledgeable regarding signs of pain, distress and illness specific to each species housed. After animals are allocated to an approved project the investigator has primary responsibility for ensuring adequate monitoring of the animals' well-being.
147. The person-in-charge must ensure that ill or injured animals which are not assigned to approved projects are treated promptly and the cause of death investigated for animals which die unexpectedly.
148. The person-in-charge should contribute to the development and maintenance of the institution's animal care policies and procedures.
149. The person-in-charge must ensure that staff are provided with appropriate protective clothing, maintain high standards of personal hygiene, do not eat, drink or smoke in animal areas, and have all required vaccinations, particularly against tetanus and other zoonoses.
150. The person-in-charge must document procedures used in the management of holding and breeding facilities. These procedures should take into account the requirements of the species held, the studies being conducted, and the health and safety of the staff, and include transport, quarantine and disposal of animals, routine husbandry, prevention, diagnosis and treatment of disease, monitoring of health status and genetic constitution, and physical environmental factors. These procedures should be made

known to all staff involved in the care and use of the animals and should be reviewed regularly.

151. The person-in-charge must ensure that adequate records are maintained of:
  - i. the source, care, allocation, movement between locations, use and disposal of all animals, and any diseases developed;
  - ii. the fertility, fecundity, morbidity and mortality in breeding colonies, in order to monitor the management of the colonies, and to assist detection of the origin and spread of disease; and
  - iii. the health status, genetic constitution and the physical environment of the animals, when definition of these is required.
152. Records maintained by the person-in-charge must be made available to investigators.
153. The person-in-charge should ensure that investigators are informed of any changes to the conditions under which animals are held and which may affect the results of their studies.

#### **Staff**

154. The most important factor ensuring high standards of animal care is enough well-trained, committed staff. Personnel working with animals in a holding facility should be appropriately instructed in the care and maintenance of those animals, how they may affect the animals' well-being and how their actions may affect the outcome of scientific and teaching activities.
155. Institutions should encourage and promote formal training in animal science or technology.
156. Personnel employed in the care of animals should be instructed in how to recognise at an early stage changes in animal behaviour, performance and appearance.
157. New appointees who will care for animals must be appropriately instructed in their duties and in institutional policy.
158. Staff should be informed of the important zoonotic diseases of animals under their care and of precautions that should be taken. Regular health checks of staff who handle animals are recommended in the interests of both staff and animals.

**Sources Cited:**

- *International Guiding Principles for Biomedical Research involving Animals*

[http://www.cioms.ch/1985\\_texts\\_of\\_guidelines.htm](http://www.cioms.ch/1985_texts_of_guidelines.htm)

- *The Code of Practice: Care and Use of Animals for Experimental Purposes (the Code of Practice) published by the Animal Welfare Advisory Group:*

[http://www.afcd.gov.hk/english/publications/publicatons\\_qua/giles/code.pdf](http://www.afcd.gov.hk/english/publications/publicatons_qua/giles/code.pdf)

- *AVMA Guidelines on Euthanasia (2007)*

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