

## **APPENDICES**

### **Appendix I**

The Ministry of Public Health Recommendations on animal housing and management, acquisition of animals and conduct of experiment.

See also:

Guide for the Care and Use of Laboratory Animals (Institute for Laboratory Animal Research):

[http://www.nap.edu/openbook.php?record\\_id=5140](http://www.nap.edu/openbook.php?record_id=5140)

Guide to the Care and Use of Experimental Animals Volume 1 (Canadian Council on Animal Care):

[http://www.ccac.ca/en/CCAC\\_Programs/Guidelines\\_Policies/GUIDES/ENGLISH/toc\\_v1.htm](http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GUIDES/ENGLISH/toc_v1.htm)

### **Appendix II**

Terms of Reference for Animal Care Committee

#### **Laboratory Animal Research Guidelines**

#### **Appendices I and II**

**Qatar Ministry of Public Health**

**Department of Research**

### **Appendix I**

Recommendations on animal housing and management, acquisition of animals and conduct of experiments

## **TABLE OF CONTENTS**

### **1. ANIMAL HOUSING AND MANAGEMENT**

- 1.1 General
- 1.2 Indoor Housing Facilities
- 1.3 Outdoor Housing Facilities
- 1.4 Environmental Factors
- 1.5 Pens, cages and containers and the immediate environment of animals
- 1.6 Food and water
- 1.7 Identification of animals
- 1.8 Disposal of animal carcasses and waste
- 1.9 Admission of new animals

### **2. ACQUISITION OF ANIMALS**

### **3. CONDUCT OF EXPERIMENTS**

- 3.1 Detecting pain and distress
- 3.2 Limiting pain and distress
- 3.3 Repeated use of animals in experiments
- 3.4 Duration of experiments
- 3.5 Handling and restraining animals
- 3.6 Completion of Projects
- 3.7 Euthanasia
- 3.8 Post-Mortem Examination
- 3.9 Anaesthesia and surgery
- 3.10 Post-operative care
- 3.11 Implanted devices
- 3.12 Neuromuscular paralysis
- 3.13 Electro-immobilisation
- 3.14 Toxicological experiments
- 3.15 Experiments involving hazards to humans or animals
- 3.16 Experimental manipulation of animals' genetic material
- 3.17 Withholding food or water

## 1. ANIMAL HOUSING AND MANAGEMENT

### 1.1 General

In general, housing and management practices should be designed, equipped and maintained to provide a high standard of animal care, and to fulfil scientific requirements.

Housing facilities where animals are kept should be appropriately staffed. The standard of animal care shall be maintained over weekends and holidays.

Emergency veterinary care procedures shall be available at all times.

Entry should normally be restricted to authorized persons.

**TABLE (1.1)** Recommended Dry-Bulb Macroenvironmental Temperatures for Common Laboratory

Animals	Dry-Bulb Temperature	
	°C	°F
Mouse, rat, hamster, gerbil, guinea pig	20-26	68-79
Rabbit	16-22	61-72
Cat, dog, nonhuman primate	18-29	64-84
Farm animals, poultry	16-27	61-81

Table (1.1): adopted from guide for the Care and Use of Laboratory animals – 8th edition.

Dry-bulb room temperature settings for rodents are typically set below the animals' low critical temperature (LCT) to avoid heat stress, and should reflect different species-specific LCT values. Animals should be provided with adequate resources for thermoregulation (nesting material, shelter) to avoid cold stress.

**TABLE (1.2)** Recommended Minimum Space for Commonly Used Laboratory Rodents Housed in Groups\*

Animals	Weight (g)	Floor Area/Animal In <sup>2</sup> (cm <sup>2</sup> )	Height b In (cm)	comments
Mice in groups	<10 Up to 15 Up to 25 > 25	6(38.7) 8(51.6) 12(77.4) ≥15 (≥96.7)	5 (12.7) 5 (12.7) 5 (12.7) 5 (12.7)	Larger animals may require more space to meet the performance standards.
Female+ litter		51 (330) (recommended space for the housing group)	5 (12.7)	Other breeding configurations may require more space and will depend in considerations such as number of adults and litters, and size and age of litters. <sup>d</sup>

Rats in groups	<100	17(109.6)	7 (17.8)	Larger animals may require more space to meet the performance standards.
	Up to 200	23(148.35)	7 (17.8)	
	Up to 300	29(187.05)	7 (17.8)	
	Up to 400	40(258.0)	7 (17.8)	
	Up to 500	60(387.0)	7 (17.8)	
	> 500	≥70 (≥451.5)	7 (17.8)	
Female + litter		124 (800) (recommended space for the housing group)	7 (17.8)	Other breeding configurations may require more space and will depend in considerations such as number of adults and litters, and size and age of litters.
Hamsters <sup>c</sup>	<60	10 (64.5)	6 (15.2)	Larger animals may require more space to meet the performance standards.
	Up to 80	13 (83.8)	6 (15.2)	
	Up to 100	16 (103.2)	6 (15.2)	
	> 100	≥19 (≥122.5)	6 (15.2)	
Guinea pigs <sup>c</sup>	Up to 350	60 (387.0)	7 (17.8)	Larger animals may require more space to meet the performance standards.
	> 350	≥101 (≥651.5)	7 (17.8)	

**Table (1.2):** adopted from guide for the Care and Use of Laboratory animals – 8th edition.

\*The interpretation of this table should take into consideration the performance indices described in the chapter 4.

- a. Singly housed animals and small groups may require more than the applicable multiple of the indicated floor space per animal.
- b. From cage floor to cage top.
- c. Consideration should be given to the growth characteristics of the stock or strain as well as the sex of the animal. Weight gain may be sufficiently rapid that it may be preferable to provide greater space in anticipation of the animal's future size. In addition, juvenile rodents are highly active and show increased play behavior.
- d. Other considerations may include culling of litters or separation of litters from the breeding group, as well as other methods of more intensive management of available space to allow for the safety and well-being of the

breeding group. Sufficient space should be allocated for mothers with litters to allow the pups to develop to weaning without detrimental effects for the mother or the litter

**TABLE (1.3)** Minimum Space for Rabbits, Cats, and Dogs Housed in Pairs or Groups\*

Animals	Weight (g)	Floor Area/Animal ft <sup>2</sup> (m <sup>2</sup> )	Height b in (cm)	comments
Rabbit	<2	1.5 (0.14)	16 (10.5)	Larger animals may require more space to meet the performance standards.
	Up to 4	3.0 (0.28)	16 (10.5)	
	Up to 5.4	4.0 (0.37)	16 (10.5)	
	> 5.4 <sup>c</sup>	≥5.0 (≥0.46)	16 (10.5)	
Cats	≤4	3.0 (0.28)	24 (60.8)	Vertical space with perches is preferred and may require additional cage height.
	> 4 <sup>d</sup>	≥4.0 (≥0.37)	24 (60.8)	
Dogs <sup>e</sup>	<15	8.0 (0.74)	<sub>f</sub>	Cage height should be sufficient for the animals to comfortably stand erect with their feet on the floor.
	Up to 30	12.0 (1.2)	<sub>f</sub>	
	> 30 <sup>d</sup>	≥24.0 (≥2.4)	<sub>f</sub>	

**Table (1.3):** adopted from guide for the Care and Use of Laboratory animals – 8th edition.

\*The interpretation of this table should take into consideration the performance indices described in the text beginning on chapter 4.

- e. To convert kilograms to pounds, multiply by 2.2.
- f. Singly housed animals may require more space per animal than recommended for pair- or group-housed animals.
- g. From cage floor to cage top.
- h. Larger animals may require more space to meet performance standards (see text).
- i. These recommendations may require modification according to body conformation of individual animals and breeds. Some dogs, especially those toward the upper limit of each weight range, may require additional space to ensure compliance with the regulations of the Animal Welfare Act. These regulations (USDA 1985) mandate that the height of each cage be sufficient to allow the occupant to stand in a “comfortable position” and that the minimal square feet of floor space be equal to the “mathematical square of the sum of the length of the dog in inches (measured from the tip of its nose to the base of its tail) plus 6 inches; then divide the product by 144.”
- j. Enclosures that allow greater freedom of movement and unrestricted height (i.e., pens, runs, or kennels) are preferable.

**TABLE (1.4):** Minimum Space for Avian Species Housed in Pairs or Groups

Animals	Weight (kg)	Floor Area/Animal <sup>b</sup> ft <sup>2</sup> (m <sup>2</sup> )	Height b in (cm)
Pigeons	—	0.8 (0.7)	Cage height should be sufficient for the animals to comfortably stand erect with their feet on the floor.
Quail	—	0.25 (0.023)	
Chickens	<0.25	0.25 (0.023)	

	Up to 0.5	0.50 (0.0460)	
	Up to 1.5	1.00 (0.093)	
	Up to 3.0	2.00(0.186)	
	> 3.0 <sup>d</sup>	≥3.00 (≥0.279)	

**Table (1.4):** adopted from guide for the Care and Use of Laboratory animals – 8th edition.

The interpretation of this table should take into consideration the performance indices Described in the text beginning on page 55.

a. To convert kilograms to pounds, multiply by 2.2.

b. Singly housed birds may require more space per animal than recommended for pair- or group-housed birds.

c. Larger animals may require more space to meet performance standards.

**TABLE (1.5):** Minimum Space for Nonhuman Primates Housed in Pairs or Groups\*

Animals	Weight (Kg)	Floor Area/Animal ft <sup>2</sup> (m <sup>2</sup> )	Height <sup>b</sup> in (cm)	comments
Monkeys <sup>d</sup> (including baboons)				Cage height should be sufficient for the animals to comfortably stand erect with their feet on the floor. Baboons, patas monkeys, and other longer-legged species may require more height than other monkeys, as might long-tailed animals and animals with prehensile tails. Overall cage volume and linear perch space should be considerations for many neotropical and arboreal species. For brachiating species cage height should be such that an animal can, when fully extended, swing from the cage ceiling without having its feet touch the floor. Cage design should enhance brachiating movement.
Group 1	Up to 1.5	2.1 (0.20)	30 (76.2)	
Group 2	Up to 3	3.0 (0.28)	30 (76.2)	
Group 3	Up to 10	4.3 (0.4)	30 (76.2)	
Group 4	Up to 15	6.0 (0.65)	32 (81.3)	
Group 5	Up to 20	8.0 (0.74)	36 (91.4)	
Group 6	Up to 25	10 (0.93)	46 (116.8)	
Group 7	Up to 30	15 (1.40)	46 (116.8)	
Group 8	> 30 <sup>d</sup>	≥25 (≥2.32)	60 (152.4)	
Chimpanzees ( <i>Pan</i> )				For other apes and large brachiating species cage height should be such that an animal can, when fully extended, swing from the cage ceiling without having its feet touch the floor. Cage design should enhance brachiating movement.
Juveniles	Up to 10	15 (1.4)	60 (152.4)	
Adults <sup>f</sup>	> 10	≥25 (≥2.32)	84 (213.4)	

**Table (1.5):** adopted from guide for the Care and Use of Laboratory animals – 8th edition.

\*The interpretation of this table should take into consideration the performance indices described in the text beginning on chapter 4.

a. To convert kilograms to pounds, multiply by 2.2.

b. Singly housed primates may require more space than the amount allocated per animal when group housed.

c. From cage floor to cage top.

d. Callitrichidae, Cebidae, Cercopithecidae, and Papio.

e. Larger animals may require more space to meet performance standards (see chapter 4).

f. Apes weighing over 50 kg are more effectively housed in permanent housing of masonry, concrete, and wire-panel structure than in conventional caging.

**TABLE (1.6):** Minimum Space for Agricultural Animals\*

<b>Animals/ Enclosure</b>	<b>Numbers</b>	<b>Weight,<sup>a</sup> (Kg)</b>	<b>Floor Area/Animal,<sup>b</sup> ft<sup>2</sup> (m2)</b>
Sheep and Goats	1	<25	10.0 (0.9)
		Up to 50	15.0 (1.35)
		> 50 <sup>c</sup>	≥20.0 (≥1.8)
	2-5	<25	8.5 (0.76)
		Up to 50	12.5 (1.12)
		> 50 <sup>c</sup>	≥17.0 (≥.53)
	>5	<25	7.5 (0.67)
		Up to 50	11.3 (1.02)
		> 50 <sup>c</sup>	≥15.0 (≥1.35)
Swine	1	<15	8.0 (0.72)
		Up to 25	12.0 (1.08)
		Up to 50	15.0 (1.35)
		Up to 100	24.0 (2.16)
		Up to 200	48.0 (4.32)
		> 200 <sup>c</sup>	≥60.0 (≥5.4)
	2-5	<25	6.0(0.54)
		Up to 50	9.0 (0.81)
		Up to 100	18.0 (1.62)
		Up to 200	36.0 (3.24)
	>5	> 200 <sup>c</sup>	≥52.0 (≥4.68)
		<25	6.0 (0.54)
Up to 50		9.0 (0.81)	
Up to 100		18.0 (1.62)	
>5	Up to 200	36.0 (3.24)	
	> 200 <sup>c</sup>	≥48.0 (≥4.32)	

Cattle	1	<75	24.0 (2.16)
		Up to 200	48.0 (4.32)
		Up to 350	72.0 (6.48)
		Up to 500	96.0 (8.64)
		Up to 650	124.0 (11.16)
		> 650 <sup>c</sup>	≥144.0 (≥12.96)
	2-5	<75	20.0 (1.8)
		Up to 200	40.0 (3.6)
		Up to 350	60.0 (5.4)
Up to 500		80.0 (7.2)	
Up to 650		105.0 (9.45)	
> 650 <sup>c</sup>		≥120.0 (≥10.8)	
>5	<75	18.0 (1.62)	
	Up to 200	36.0 (3.24)	
	Up to 350	54.0 (4.86)	
	Up to 500	72.0 (6.48)	
	Up to 650	93.0 (8.37)	
	> 650 <sup>c</sup>	≥108.0 (12.96)	
Horses		—	144.0 (12.96)
Ponies	1-4	—	72.0 (6.48)
	>4/pen	≤200	60.0 (504)
		> 200 <sup>c</sup>	≥72.0 (≥6.48)

**Table (1.6):** adopted from guide for the Care and Use of Laboratory animals – 8th edition.

\*The interpretation of this table should take into consideration the performance indices Described in the text beginning on chapter 4.

- a. To convert kilograms to pounds, multiply by 2.2.
- b. Floor area configuration should be such that animals can turn around and move freely without touching food or water troughs, have ready access to food and water, and have sufficient space to comfortably rest away from areas soiled by urine and feces (see text).
- c. Larger animals may require more space to meet performance standards including sufficient space to turn around and move freely (see chapter 4).

## 1.2 Indoor Housing Facilities

Housing Facilities should be compatible with the needs of the species to be housed.

Housing Facilities should be maintained in good repair and kept clean and tidy. Walls and floors should be constructed of durable materials with surfaces that can be cleaned and disinfected readily.

There should be a pest control programme to monitor and control vermin.

There should be separate and appropriate storage areas for food, bedding and equipment. The choice of detergents, disinfectants and pesticides should be made in consultation with Investigators in order not to contaminate the animal's environment. Deodorants designed to mask animal odours should not be used.

Cleaning practices should be monitored on a regular basis to ensure effective hygiene and sanitation. This can include visual inspection, monitoring water temperatures and microbiological testing of surfaces after cleaning.

There should be proper water supply and drainage, as appropriate.

There should be adequate contingency plans to cover such emergencies as flooding and fire, or the breakdown of lighting, heating, cooling or ventilation.

### **1.3 Outdoor Housing Facilities**

These should be compatible with the needs of the species, provide adequate shelter and water, and comply with established farm, zoological garden or general outdoor housing practices.

### **1.4 Environmental factors**

Animals should be provided with environmental conditions which suit their behavioural and biological needs unless contrary conditions are approved by the ACC for the purposes of a Project.

Air exchange, temperature, humidity, noise, light intensity and light cycles should be maintained within limits compatible with the health and well-being of the animals.

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, both within cages and within a room.

Noxious and potentially harmful waste gases, particularly ammonia, should be kept to a level compatible with the health and comfort of the animals.

### **1.5 Pens, cages and containers and the immediate environment of animals**

Pens, cages and containers should be designed, constructed and maintained to ensure the comfort and well-being of the animals, taking into account species-specific behavioural and environmental requirements, cleaning and requirements of the experiments.

Pens, cages and containers should always be kept clean and in good repair.

The use of wire floor cages requires a separate approval by the ACC. Their use should be scientifically well justified and should be minimized. Animals should have a solid resting area when housed in wire floor cages.

The population density of animals within cages, pens or containers and the placement of these in rooms should 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 that normally exists in social groups, the impact and time of social isolation should be kept to a minimum.

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. Animals must be provided with nesting materials, where appropriate.

The ACC and the Investigators should be informed in advance of planned changes to the housing conditions by the Staff who manages the Housing Facilities.

#### **1.6 Food and water**

Animals must receive appropriate, uncontaminated and nutritionally adequate food according to accepted requirements for the species.

Uneaten perishable food should be removed promptly unless contrary to the eating habits or needs of the species.

Clean, fresh drinking water should be available at all times as suitable for the species.

Feed and water equipment should be constructed of materials that can be easily and effectively cleaned.

Variations to these requirements as part of a project must receive prior ACC approval.

#### **1.7 Identification of animals**

Animals should be identified by a reliable method such as tattoo, neck-band, individual tag, electronic numbering device, physical mark, or by a label or marking attached to the cage, container, pen, yard or enclosure in which the animals are kept.

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

Appropriate provision must be made for prompt and sanitary disposal of animal carcasses and waste material.

#### **1.9 Admission of new animals**

Institutions should have quarantine facilities for new animals to be housed separately from existing animals in the Facilities.

New animals should be immediately inspected for health by a veterinarian or a person

designated by a veterinarian and then placed in quarantine.

The quarantine period should be sufficient to allow the animals to acclimatise to the Housing Facility and the Staff.

## **2. ACQUISITION OF ANIMALS**

All animals obtained must be from a licensed or otherwise legally permitted source. If the source does not clearly fulfil these conditions, a prior permit must be obtained from the Ministry of Public Health. For animals such as dogs, cats and farm animals such as sheep, goats and cattle, the animals should be properly identified and the supplier must have appropriate papers to prove legal ownership of the animals.

The conditions and duration of the transportation must be ensured to minimize the impact on animal health and welfare. Containers must be escape and tamper proof and there should be adequate nesting or bedding material where appropriate. Animals should be protected from sudden movements and extremes of climate. When new animals are admitted into holding areas, they should be held separately, inspected by a qualified person and quarantined if necessary. Animals should be acclimatised to the holding facility and personnel before their use in a project and those that do not adapt satisfactorily should not be kept.

### 3. CONDUCT OF EXPERIMENTS

Humane consideration for the well-being of the animal should be incorporated into the design and conduct of all procedures involving animals, while keeping in mind the primary goal of experimental procedures--the acquisition of sound and replicable data.

#### 3.1 Detecting pain and distress

Investigators and teachers should be familiar with the behavioural patterns of the animal species chosen and knowledgeable about signs of pain and distress specific to that species and must assess animals regularly for these signs. Animals must be regularly assessed for signs of pain or distress (e.g. aggressive or abnormal behaviour, abnormal appetite and a rapid decline in body weight).

#### 3.2 Limiting pain and distress

Investigators and teachers must anticipate and take all possible steps to avoid or minimize pain and distress including:

- a) choosing the most appropriate and humane method for the conduct of the experiment
- b) ensuring the technical skills and competence of all persons involved in animal care and use are appropriate
- c) use of pre-emptive analgesia when pain is anticipated
- d) ensuring that animals are adequately monitored for evidence of pain and distress
- e) acting promptly to alleviate pain and distress
- f) using anaesthetic, analgesic and tranquillizing agents appropriate to the species and the experimental purposes
- g) determining criteria for early intervention and humane end-points
- h) conducting projects over the shortest time practicable
- i) using appropriate methods of euthanasia.

Where the condition of an animal indicates that there is a need for intervention to limit pain or distress, actions that may be taken include an increase in the frequency of observation, consultation with a veterinarian, administration of analgesic agents or other appropriate medication, removal from the project and euthanasia.

Experiments which are liable to cause pain of a kind and to a degree for which anaesthesia would normally be used in medical or veterinary practice must be carried out under anaesthesia. Scientific and teaching activities that 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.

If animals develop signs of severe pain or distress despite the precautions outlined above, the pain or distress must be alleviated promptly or the animals must be euthanized without delay. Unexpected deaths occurring during a Project must be properly investigated by a veterinarian or other qualified person who will determine the cause and initiate remedial action. If the deaths are due to manipulations, these must cease. The ACC must be notified of all unexpected deaths and the Project protocol resubmitted with appropriate modification.

### **3.3 Repeated use of animals in experiments**

Individual animals should not be used in more than one experiment, either in the same or different projects, without the approval of the ACC. However, appropriate reuse 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. The following has to be taken into account when considering approval the reuse of animals:

- a) the pain or distress and any potential long-term or cumulative effects caused by any previous procedures;
- b) the total time that an animal will be used;
- c) the pain or distress likely to be caused by the next and subsequent procedures;
- d) whether an animal has recovered fully from the previous procedure before being used in the next.

### **3.4 Duration of experiments**

Scientific and teaching activities, particularly those that cause any pain or distress, should be as brief as practicable. ACC approval must be sought for the continued long-term use of individual animals.

### **3.5 Handling and restraining animals**

Animals should be handled by competent individuals trained in methods that cause minimal distress and injury. The use of restraint devices is sometimes essential for the welfare of the animal and safety of the handler. Restraint devices should be used to the minimum extent, for the minimum period required to accomplish the purpose of the experiment, and be appropriate for the animal.

Tranquilisers or anaesthetics may aid restraint but may prolong recovery from the procedure. When these agents have been used, recovery of the animals should be monitored. Periods of prolonged restraint or confinement should be avoided. Where animals are in prolonged restraint, consideration should be given to their biological needs, and they should be monitored regularly by a veterinarian or other qualified person.

### **3.6 Completion of Projects**

Upon completion of the project, animals must be returned promptly to normal husbandry conditions or their natural habitat if appropriate and permitted, or where necessary, killed humanely.

### **3.7 Euthanasia**

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 must be performed only by personnel approved as competent by the ACC or under the direct supervision of a competent person.

Animals should be killed in a quiet, clean environment, and preferably away from other animals.

Death must be established before disposal of the carcass occurs.

Dependent neonates of animals being killed must also be killed or provision made for their care.

Methods of killing must be appropriate to the developmental stage of the animal.

Disposal of fertilised eggs, foetuses and embryos must not occur until death is assured.

### **3.8 PostMortem**

#### **Examination**

A post-mortem examination should be considered when animals die unexpectedly. Records of post-mortem examinations should be kept.

### **3.9 Anaesthesia and surgery**

All surgical procedures and anesthetization should be conducted under the direct supervision of a person who is competent in the use of the procedures.

Surgical procedures should be carried out under appropriate local or general anaesthesia.

There should be adequate monitoring of the depth of anaesthesia and effects such as hypothermia, and cardiovascular and respiratory depression.

Sound postoperative monitoring and care, which may include the use of analgesics and antibiotics, should be provided to minimize discomfort and to prevent infection and other untoward consequences of the procedure. When more than one surgical procedure is to be performed on an individual animal, the time between each procedure must allow a recovery to good general health unless otherwise justified. For non-recovery surgery, the animal must remain unconscious throughout the procedure.

### **3.10 Postoperative care**

Investigators should ensure that adequate postoperative care and monitoring is provided. They should ensure that they, or other experienced personnel, are fully informed of the animals' condition.

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 minimize post-operative pain or distress. Care should be taken that animals recovering from anaesthesia are housed to prevent injury and that conditions are such that they are not disturbed, attacked or killed by other animals in the same enclosure.

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

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 and a veterinarian informed immediately.

### **3.11 Implanted devices**

Skilled and specialised attention is required in the care of animals following operations in which recording or sampling devices are implanted, or fistulae created. Animals should be assessed frequently for any signs of pain, distress or infection and treated immediately if these occur.

### **3.12 Neuromuscular paralysis**

Neuromuscular blocking agents (such as T-61) must not be used without adequate general anaesthesia or an appropriate surgical procedure which eliminates sensory awareness.

### **3.13 Electroimmobilisation**

Electro-immobilisation must not be used as an alternative to analgesia or anaesthesia.

### **3.14 Toxicological experiments**

The end-point of toxicological experiments must be as early as is compatible with reliable assessment of toxicity, and must minimise the extent of any pain and distress. When Death as an end-point cannot be avoided, the experiments must be designed to result in the deaths of as few animals as possible.

### **3.15 Experiments involving hazards to humans or animals**

Protocols submitted to the ACC should include a description of any intended use of hazardous compounds or organisms. These include viruses, bacteria, fungi, parasites, radiation, radioactivity, corrosive, toxins, allergens, carcinogens, recombinant DNA, anaesthetic gases and physical injuries.

Animals being administered infectious organisms should be isolated as appropriate, taking into account risks to other animals, to people and to environment.

Investigators must not allow the experiments 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 experiments are the prevention, alleviation, treatment or care of a life-threatening disease or situation in human beings or animals.

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

All proposals to manipulate the genetic material of animals, their germ cells or embryos must be submitted to the ACC for approval. 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 ACC of the known potential adverse effects to the well-being of the animals. The clinical status of animals in which the genetic material has been manipulated experimentally must be monitored for unusual or unexpected adverse effects, and such effects reported to the ACC.

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

Experiments involving the withholding or severe restriction of food or water should produce no continuing detrimental effect on the animals. In these experiments, the fluid balance and/or body weight must be monitored, recorded and maintained within the limits approved by the ACC.

## **Appendix II**

### Terms of Reference for Animal Care Committees

#### **Introduction**

The Ministry of Public Health requires that institutions conducting animal based research, teaching or testing in Qatar, establish an animal care committee (ACC). Each committee's operation must be governed by formal Terms of Reference that include the following Terms, but need not be limited to them. The ACC's Terms of Reference must be tailored to reflect and refer to the institution's animal care program, including the members of the program, and the institution's policies, practices and procedures. No activity involving animals may be conducted until the institution conducting the activity has provided a written Terms of Reference acceptable to the Ministry of Public Health, setting forth compliance with the Ministry of Public Health Guidelines.

Institutional ACCs should be responsible directly to the institution's senior administrator (e.g. CEO or Dean) The institution must work with the ACC to ensure that all animal users are informed of and comply with the Ministry of Public Health Guidelines and institutional animal care and use policies and procedures.

#### Animal Care Committee (ACC)

1. Membership | 2. Authority | 3. Responsibility | 4. Meetings

##### **1. Membership**

All committees should consist of a minimum of five individuals to include:

- (a) the ACC chairperson;
- (b) a veterinarian, formally trained and/or with experience in laboratory animal medicine;
- (c) a scientist and/or teacher experienced in using laboratory animals for experimental purposes;

At least two from the following categories.

- (d) technical staff representation (e.g. an animal research technician);
- (e) an institutional member whose normal activities, past or present, do not depend on or involve animal use for scientific purposes;
- (f) student representation (graduate and/or undergraduate), in the case of institutions that have programs where students use animals; and
- (g) a public member to represent general community interest.

The Senior Administrator is not to be appointed as a member of the ACC.

The chairperson of the ACC shall be appointed by the Senior Administrator.

The membership list with the individual's curriculum vitae should be sent to the Ministry of Public Health for approval.

## **2. Responsibility and Authority**

A quorum (simple majority) should be established for all ACC meetings.

The ACC has responsibility for ensuring:

- a) that no use of animals for scientific purposes (including research, testing or teaching) commences without prior ACC approval of a written Animal Use Protocol;
- b) that all animal use procedures comply with the Ministry of Public Health guidelines;
- c) compliance with approved Animal Use Protocols.

The ACC has the authority to:

- a) approve Animal Use Protocols for using animals in research or teaching;
- b) withdraw the approval and stop any procedure if it considers that unnecessary or unforeseen distress or pain is being experienced by an animal;
- c) stop immediately any use of animals which deviates from the approved Animal Use Protocol or any non-approved procedure;
- d) have an animal killed humanely if pain or distress caused to the animal is not part of the approved protocol and cannot be alleviated.

The Chair of the ACC and the veterinarian(s) must have access at all times to all areas where animals are maintained and/or used.

Each institution must establish procedures for post-approval monitoring of animal use protocols, and must define the roles and responsibilities of the senior administrator, the ACC and members of the animal care and use program in the monitoring process.

ACCs must ensure appropriate care of animals in all stages of their life and in all experimental situations. Veterinary care must always be available at least on a consultative basis. The ACC must delegate to the veterinarian(s) the authority to treat, remove from a study or euthanize, if necessary, an animal according to the veterinarian's professional judgment.

## **3. Animal Use Protocols**

The Animal Use Protocol should include:

- i) project title and descriptive procedural keywords;
- ii) principal investigators/teachers, and all personnel who will handle animals, along with their training and qualifications with respect to animal handling;

iii) proposed start date, proposed end date (if the study is to take place over more than one year, the work and numbers of animals for the first year only should be approved, and further work can then be approved in yearly protocol renewal(s);

iv) for research projects, an indication of whether the project has received peer review for scientific merit;

v) for teaching programs, a justification for using live animals;

vi) information with regard to the Three Rs (replacement, reduction and refinement alternatives) of animal use, such as:

- justification of the species and numbers of animals to be used;
- a description of all of the refinements to be employed to protect and enhance animal health and welfare, such as anesthesia and analgesia (strong scientific justification must be provided for not using anesthesia or analgesia in the case of invasive protocols) and other medical treatments as appropriate;
- any refinements to be used, such as housing and husbandry methods, and environmental enrichment as a means to refine animal care;
- The use of pilot studies with few animals when new approaches, methods or products are being tried.

vii) a clear description detailing the procedures that are to be carried out on the animals;

viii) a description of the endpoint(s) of the experimentation;

ix) the method of euthanasia;

x) a description of the fate of the animals if they are not to be euthanized, including the length of time that they are to be held;

ACCs must ensure that animal users immediately report to the committee any unanticipated problems or complications in the implementation of an approved protocol, as well as the steps they have taken to address the problem(s). The principal investigator is responsible for submitting any protocol modifications to the ACC for approval before they are implemented. ACCs should define, in writing, their own criteria as to what constitutes a major modification to a protocol (e.g., a considerable increase of the number of animals required vs. the number in the original protocol, a change of species, use of more invasive or more frequent procedures, use of entirely new procedures, or other criteria).

All major protocol modifications, as defined by the ACC, must be re-reviewed and approved by the ACC. Minor protocol modifications, as defined by the ACC, can be approved by the veterinarian member of the ACC alone. A notification of all approved minor modifications must be sent to all other ACC members immediately. All Animal Use Protocols must be reviewed by the

ACC at least annually, i.e. within a year of the commencement of the project. The principal investigator is responsible for submitting an updated Animal Use Protocol for annual renewal of ACC approval.

#### **4. Meetings**

Animal Care Committees should meet at least twice per year and as often as necessary to fulfill their Terms of Reference and the needs of the Investigators. Minutes detailing ACC discussions, decisions and modifications to protocols must be produced for each meeting, and must be forwarded to the institution's senior administrator. They must be available to the Ministry of Public Health upon request.

The ACC must visit all animal care facilities and areas in which animals are used, at least annually, in order to better understand the work being conducted within the institution, to meet with those working in the animal facilities and animal use areas and discuss their needs, to monitor animal-based work according to approved protocols and standard operating procedures, to assess any weaknesses in the facilities and to forward any recommendations or commendations to the person(s) responsible for the facilities and for animal use. The animal facility visits should be documented through the ACC minutes or written records.