

## **Guiding principles for the care and use of animals in the field of physiological sciences**

Partially revised on April 1, 2015

Animal experiments have become an indispensable part of physiological research and education. Physiological research involving animal models plays a major role in understanding the nature of life and the mechanisms of specific vital processes, and the results are often applied to medical science and medical treatments; thus, this research has countlessly contributed to human health maintenance and animal welfare. In Japan, legislation related to the drafting of scientific protocols involving animal experiments is documented in the “Act on Welfare and Management of Animals, Act 105,” which was revised in 2006, enacted, and then further revised in 2012. The “Fundamental Guidelines for Proper Conduct of Animal Experiments and Related Activities in Academic Research Institutions (Ministry of Education, Culture, Sports, Science and Technology, Notice No. 71)” was based on the 2006 legal revisions. Drawing on these existing laws and guidelines, we have created this set of basic guidelines to ensure that sufficient consideration is given to high ethical standards in animal welfare in physiological animal experiments, which mainly involve vertebrates. By creating these guidelines, we aim to rapidly advance physiological research and further enhance physiology education. Animal experiments, including those in the field of physiology, are subject to the regulations of the animal care and use committee at the relevant research institution, and are the responsibility of the head of the institution. Experimenters should adhere to the guidelines below and only conduct experiments that are eligible within these guidelines. In addition, to guarantee adherence to these guidelines, research presented at academic meetings held by our society or published in the *Journal of Physiological Sciences* is limited to research that has been approved by the animal care and use committee located at the respective university or research institution, irrespective of whether the research was conducted overseas or within Japan.

This current edition of “Guiding principles for the care and use of animals in the field of physiological sciences” (first enacted on December 5, 2003) has been revised based on the “International guiding principles for biomedical research involving animals.” (CIOMS, revised 2012) and the “Guide for the care and use of laboratory animals.” DHEW Publication. No. (NIH) 85-23, 1996.

Basic principles

The basic principles are to respect the lives of animals used during experiments, and ensure that the welfare and humane handling of animals is pursued to the greatest extent possible. Therefore, every effort should be made to adhere to the following three principles:

- 1) Proactively adopting techniques that can substitute animal experiments.
- 2) Reduce the number of experimental animals to the smallest possible number that is necessary to produce effective scientific results.
- 3) Refine experiment methodology so as to reduce the levels of suffering and stress experienced by animals through appropriate maintenance of housing facilities and surgical operating techniques. In particular, special consideration should be given to the selection and use of anesthetic agents to alleviate suffering.

### Specific Guidelines

Experimenters within Japan should act in accordance with the “Fundamental Guidelines for Proper Conduct of Animal Experiments and Related Activities in Academic Research Institutions (Ministry of Education, Culture, Sports, Science and Technology, Notice No. 71).” When using genetically modified animals for experiments, these should only be transferred and housed through the proper procedures and in accordance with Cartagena Protocol.

#### 1. Animal acquisition and transportation methods

All animals should be obtained legally. When using wild animals for experiments, these should only be acquired through the proper procedures and in accordance with guidelines for nature conservation. When using imported animals, the Washington Convention for nature conservation should be complied with. When transporting animals, a person with specialist knowledge, such as veterinarian, should conduct quarantine of the animals as required to prevent infection of the experimenter and the animal-care staff, and to prevent infection among animals. In particular, detailed examination for zoonoses is required.

#### 2. Animal housing methods

##### 1) Buildings and equipment

In general, animals should be housed in a dedicated animal facility that is clean and subject to strict environmental controls. When it is unavoidable that animals be housed outside a dedicated animal facility, it is necessary to ensure that the housing space is indoors and clean, and that scrupulous attention is paid to environmental controls. In particular, sufficient measures should be in place to prevent escape or theft, noise and foul odors

should be prevented, and meticulous attention should be paid to the maintenance of the housing conditions and measures to prevent infection.

## 2) Animal housing environment and housing management

The cages in which animals are housed should be sized according to both the animal species and individual animals, such that the animals can live comfortably. The cage and surroundings should be kept clean, and the ventilation, lighting, temperature, and humidity should be controlled. Animals should be fed according to their preference with nutritionally appropriate food, and they should have easy access to fresh water. Furthermore, where possible, the housing should consider species-specific behavior and movements, with the goal to alleviate animal anxiety and stress.

## 3) Management of illness

The health status of animals should be monitored daily. When illness is detected, advice should be quickly sought from a person with specialist knowledge, such as a veterinarian, and appropriate measures should be taken to treat the animals and prevent the spread of infection.

# 3. Planning and implementation of animal experiments

## 1) Drafting the experiment plan

When planning either experiments or educational laboratory practical training that uses animals, the following criteria should be followed. The experimental objectives and results should be highly valuable from a scientific perspective and the use of animals should be absolutely critical. The experimental procedures should be refined from the perspective of animal welfare to avoid causing unnecessary suffering to the animals. The experiment plan should allow for the achievement of scientific results using the smallest possible number of animals. Experimenters and animal-care staff should take preventative measures to ensure that they are not harmed or infected by the animals. In addition, the relevant laws should be observed.

## 2) Review of the experiment protocol

Before beginning any animal experiments, experimenters should present an animal experimentation protocol to the animal care and use committee at the relevant research institution, and should have this document reviewed and approved.

### 3) Creation and archiving of animal experiment files

Experimenters should create and archive an animal experiment file detailing the status of the animal experiment. This file should contain a copy of the approved animal protocol, a record of the management and course of any health-related issues and accidents that occurred, and a description of the research results and any ensuing publications.

### 4) Experimenter qualifications

Experimenters should be skilled in the applicable experimental techniques and in the handling of experimental animals. Researchers without sufficient experience should always conduct experiments under the supervision of an experienced experimenter.

### 5) Exclusion or alleviation of suffering caused by pain or physical restraint

Experimenters should exert maximum effort to avoid causing animals suffering or pain, particularly during experiments. When animals should be physically restrained, the experiments should only be performed after the animals have been sufficiently habituated. When there are restrictions on the amount of water or food supplied, checks on the health status of the animals should be performed to ensure that they do not experience suffering. Research into the mechanisms of pain or stress is only to be conducted after review by the animal care and use committee at the respective affiliated institutions, and should be limited to those experimenters that are licensed to do such research. Finally, the absolute minimum necessary number of experiments should be conducted.

### 6) Surgical interventions

When performing surgery on animals, preoperative monitoring, sterilization, disinfection, and infection control should be considered. Sufficient consideration should be given to pre- and intraoperative administration of medication and anesthesia, as well as postoperative administration of medication and nursing care to prevent animal suffering.

### 7) Intervention after the experiment is concluded

When disposing of animals at the conclusion of an experiment, the animals should be euthanized in line with guidelines on animal welfare by methods including administering an overdose of anesthetic agents. Environmental pollution from the corpses or from tools or equipment used during the experiment should be prevented.

#### 4. Hygiene and safety of the experimenter and animal carers

During the entire experiment and while housing animals, it is important to maintain an occupational environment that is safe and healthy for the experimenter and the animal-care staff. Precautions should be taken to prevent bite wounds from the animals, to prevent infection, and to prevent environmental pollution by disinfectants or cleaning agents. It is particularly important to adhere strictly to the quarantine and infection prevention protocols to combat zoonotic infections.

#### 5. Monitoring of animal experiments and housing

The animal care and use committee at the respective research institution bears the responsibility for monitoring the animal experiments and housing and ensuring that all procedures are conducted humanely and with consideration for animal welfare.

#### 6. Publication of experiment results

Research presented at academic meetings held by our society or published in the society publications (Journal of the Physiological Society of Japan, Journal of Physiological Sciences) is limited to research that has been reviewed and approved by the animal care and use committee located at the respective research institution, irrespective of whether the research was conducted overseas or within Japan.