

Humane killing of animals used for scientific purposes policy

Intent

This policy outlines the principles behind acceptable practices for the humane killing of animals used for scientific purposes and ensure that when these procedures are carried out they are justified and result in minimal distress for animals and personnel.

These procedures give effect to the Singapore guidelines for the care and use of animals for scientific purposes (herein referred to as the Code).

Scope

These procedures apply to:

- (a) all persons involved in the care, use and monitoring of animals used for scientific purposes;
- (b) the Institutional Animal Care and Use Committee (IACUC) in its role of approving and reviewing protocols and assessing the actions taken as a result of an adverse event and

Definitions

Adverse event	means any event that has a negative impact on the wellbeing of an animal or the scientific outcome of a project.
Animal carer	means those people involved in the routine care and husbandry of animals used for scientific purposes, including during their acquisition, transport, breeding, housing and husbandry.
Anxiety	means an intense feeling of worry, fear or apprehension.
Distress	means a negative mental state that indicates when an animal is unable to cope with a degree of underlying pain, anxiety, fear, stress. In animals, it is defined by changes in behaviour and physiology.
Euthanasia	means the humane killing of an animal, in the interests of its own welfare, to alleviate pain and distress.
Feral (animal)	means an animal living in a wild state that is a member of a class of animals that usually live in a domestic state.
Humane endpoint	means a predetermined clinical sign or a set of adverse clinical signs that indicate that an animal has developed a degree of pain or distress that requires its participation in the project to be terminated, regardless of whether the scientific aim has been met. A humane endpoint is chosen purely with the wellbeing of the animal in mind and the outcome is often euthanasia.
Humane killing	means the act of inducing death using a method appropriate to the species resulting in the rapid loss of consciousness without recovery and minimum pain and/or distress to the animal
Intervention point	means a predetermined clinical sign or a set of adverse clinical signs that indicate that an animal has developed a degree of pain or distress that requires some sort of intervention to treat the pain or condition involved. If the intervention is euthanasia or removal from the study, then this is called a humane endpoint.

Investigator	means any person who uses animals for scientific purposes and is named on the IACUC protocol as an investigator. Includes researchers, teachers, undergraduate and postgraduate students involved in research projects, and people involved in product testing, environmental testing, production of biological products and wildlife surveys.
Monitoring	means the measures undertaken to assess, or to ensure the assessment of, the wellbeing of animals.
Pest (animal)	means either a non-indigenous animal regarded as being a pest or an animal declared to be a pest under a regulation to be a pest and be controlled.
Pain	means a highly unpleasant physical sensation provoked through the stimulation of nociceptors.
Project	means an activity or group of activities that form a discrete piece of work that aims to achieve a scientific purpose.
Scientific endpoint	means the planned end of participation of an animal in a project due to the fact that adequate scientific information has been gathered to meet the project's aims. It is usually a fixed period of time, or measurable event or change, and is determined with the scientific aim of the project in mind.
Unconscious	means a state where an animal is lacking awareness and the capacity for sensory perception.
Unexpected adverse event	<p>means an adverse event that was not foreshadowed in the approved project or activity.</p> <p>An unexpected adverse event may result from different causes, including but not limited to:</p> <ul style="list-style-type: none"> • death of an animal, or group of animals, that was not expected; • adverse effects following a procedure or treatment that were not expected; • adverse effects in a larger number of animals than predicted during the planning of the project or activity, based on the number of animals actually used, not the number approved for the entire study; • a greater level of pain or distress than was predicted during the planning of the project or activity; • power failures, inclement weather, emergency situations or other factors external to the project or activity that have a negative impact on the wellbeing of the animals; • effects that indicate the model or experimental design is not proceeding in a way to give meaningful results, and to continue would mean that animals may be wasted.
Wellbeing	means an animal is in a positive mental state and is able to achieve successful biological function, to have positive experiences, to express innate behaviours, and to respond to and cope with potentially adverse conditions. Animal wellbeing may be assessed by physiological and behavioural measures of an animal's physical and psychological health, of the animal's capacity to cope with stressors, and species-specific behaviours in response to social and environmental conditions.
Wildlife	Means free-living animals of native or introduced species, including those that are captive bred and those captured from free-living

populations.

Policy

Humane killing or euthanasia of animals is a common and unfortunate outcome of animal research and teaching. It has the propensity to cause extreme pain and distress for the animals and can be distressing for those who carry out or witness the procedure. There is a moral imperative to ensure that the animals used in science have the most humane death as possible.

1. Justification for the humane killing of animals

Animals being used for scientific purposes may need to be killed humanely for the following reasons:

- 1.1 The experimental endpoint is reached and the animals cannot be rehomed/rehoused, returned to normal husbandry conditions, released or reused.
- 1.2 Vital tissues must be collected for analysis or post-mortem analyses require.
- 1.3 An animal has come to the end of its breeding or experimental life and cannot be rehomed or released.
- 1.4 Animals are bred in surplus to requirements or are not suitable for use in projects and cannot be rehomed or released.
- 1.5 An adverse event has occurred or humane endpoint reached and an animal's health and wellbeing is challenged to an extent that it is not in the animal's best interest to be treated and kept alive.
- 1.6 The animal is classed as a pest or feral animal species and so if captured must not be released back into the environment.
- 1.7 It is a condition of a permit issued by an external agency that the animal is not released into wild and the animal cannot continue to be held, reused or rehomed.

2. Principles of humane killing of animals

The following principles apply when an animal is to be killed humanely:

- 2.1 All animals are to be treated with a high degree of respect and be afforded a humane and dignified death.
- 2.2 Humane killing should take place in an environment that is quiet, clean, familiar, which minimises stress and is away from other animals.
- 2.3 The method used must:
 - be appropriate for the species of animal and its developmental stage.
 - minimise pain, distress and anxiety and require minimal and stress-free handling and restraint. To achieve this, a premedicant may need to be provided in some cases.
 - result in rapid loss of consciousness, with death occurring as soon as possible afterwards. Since animals can only experience distress when they are conscious, particular attention must be made to minimise pain or distress until they lose consciousness.
 - be reliable and irreversible.
 - be safe for the operator and should not be aesthetically unpleasant.
 - not interfere with research outcomes and
 - take into account the method of carcass disposal to ensure that any chemical agents that are used don't enter the food chain or affect the environment.

- 2.4 Early life stages of animals (embryos, fetuses, fertile eggs, larvae/fry, tadpoles and neonates) have special behavioural and physiological requirements that mean that special consideration must be given to animals at early developmental stages.
- 2.5 Staff carrying out humane killing must be:
- trained in the handling and care of the animal species in question.
 - competent to carry out the method being used.
 - competent in assessing when death has been reached.
 - in possession of the appropriate license or approvals required to carry out the method being used.
- 2.6 Managers of staff carrying out humane killing must provide their staff with the appropriate support and be aware of the psychological effects the procedures may have on personnel. If staff object to carrying out humane killing then their right not to be involved must be respected.
- 2.7 Investigators must consider unexpected events that may require urgent euthanasia of animals during the conduct of the project. Therefore, a method for humane killing must be described in the protocol application to the IACUC regardless of whether it is intended that the animals will be killed at the endpoint of the experiments.
- 2.8 When working in the field, unexpected situations may arise where an animal requires euthanasia that is not planned or part of an approved protocol. Nonetheless, investigators working in field situations should be prepared for such circumstances, be trained in euthanasia and carry equipment that would facilitate euthanasia.
- 2.9 The euthanasia method must meet the principles of the Code, these procedures and associated documents. If for some reason an alternative method is required in order to meet specialised scientific requirements, the proposed method must be justified to the IACUC, meet the principles above and references must be provided to attest to its suitability.
- 2.10 When carrying out emergency euthanasia in the field, investigators may need to use a method of euthanasia that would be considered unacceptable in other circumstances. Investigators must make an ethical decision weighing up the likely suffering the animal may experience by using the unacceptable method against the suffering the animal would experience if no action is taken.
- 2.11 Whenever possible, post-mortem animal tissues or carcasses must be shared between investigators.

3. Confirmation of death

- 3.1 After an animal has been humanely killed, death must be confirmed before carcass disposal.

Related policy instruments

Guidelines for the Humane Killing of Animals used for Scientific Purposes

Related documents and legislation

Animal and Birds Act

Singapore guideline for the care and use of animals for scientific purposes

Administration

Approval Details

Policy Sponsor	Dean of Research Singapore
Approval Authority	[Refer to the approved policy framework]
Date for next review	[The policy review should be scheduled 3 years from the approval date]

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