Guidelines for the Use of Food or Fluid Restriction

The University of Texas at Austin Institutional Animal Care and Use Committee

These guidelines have been written to assist faculty, staff, and students in performing vertebrate animal procedures in a humane manner and complying with pertinent regulatory requirements. Under some circumstances deviations from these procedures may be indicated but such variances must be approved in advance by the IACUC.

This document provides introductory information to be used when planning and performing food or fluid restriction or manipulation in animals used for research, teaching, or other purposes at the University of Texas at Austin. Additional species-specific guidance is available as appendices to this document. This document is organized into four sections:

Section A – Background Information
Section B – Definitions
Section C – Monitoring Food or Fluid Restricted Animals
Section D– References and Acknowledgements

Section A – Background Information

Depending on the experimental design, some research projects may require the regulation of food and/or water to achieve desired experimental results. The objective when these studies are being planned and executed should be to use the least restriction necessary to achieve the scientific objective while maintaining animal well-being. If food or fluid restriction other than an accepted pre-anesthetic fasting procedure is to be used in an experimental protocol, the method of restriction and scientific justification for its use should be clearly explained in the protocol and submitted for IACUC approval. The procedures that restrict food or fluid must be approved by the IACUC before implementation to ensure the welfare of research animals.

Animals must always have access to water and have species-appropriate (continuous versus meal feeding) access to food unless justified and approved in the IACUC protocol. Food or fluid regulation may entail either scheduled access to food and water, so animals can eat/drink as much as they want at regular (but time-limited or controlled) intervals; or restricted access, in which the total volume of food or fluid is strictly monitored and controlled. Whenever possible, food and water scheduling should be used over food and water restriction.

Section B – Definitions

Manipulation is a change in the composition of the normally offered food or water provided in unrestricted quantities (Experimental or “special” diets).

Regulation is a deviation from the standard husbandry practices in the amount or availability of food or water. It includes scheduling and restriction as defined below. Special diets are not inherently considered regulation.

Scheduling of access to food or fluid limits the number of times or a length of periods during which the animal

has access to food or fluid so that the animal consumes a normal portion but at intervals or durations that differ from standard husbandry practices (ILAR, 2003). This definition only applies if food or fluid is removed for a period of greater than 12 hours. Scheduled feeding is not expected to result in a subnormal body weight.

Restriction is the provision of rations such that the volume of food or fluid is strictly monitored and controlled (ILAR, 2003). Restricted feeding typically limits the total volume of food or fluid consumed for the purpose of reducing the animal's weight to a level lower than that expected for an ad-libitum fed animal. Animals that do not have access to food or water for at least the periods outlined below are defined as restricted:

Food access: 1). 18 hours daily: Rodents; 2) Once daily: Most other mammals; 3) Restricted feeding that limits the total amount of food consumed for the purpose of reducing the animal's weight to a level lower than that expected ad libitum or calorically-appropriate fed animal

Water Access: 1). 18 hours daily: Rodents, rabbits; 2) One hour, twice daily: All other mammals

Ad libitum food/water intake is the amount of food or water consumed when the animal has free- access at all times.

Section C – Overview of Monitoring for Food or Fluid Restricted Animals

- According to the Guide for the Care and Use of Laboratory Animals, page 31: The development of animal protocols that involve the use of food or fluid regulation requires the evaluation of three factors:
    - the necessary level of regulation,
    - potential adverse consequences of regulation,
    - methods for assessing the health and well-being of the animals (NRC 2003b).
- Restriction should be gradually introduced, and the animals should be closely monitored to ensure that food and fluid intake meets their nutritional needs (Toth and Gardiner 2000). Body weights should be recorded at least weekly and more often depending on species and degree of restriction (NRC 2003b).
- Experimental procedures utilizing food or fluid restriction must include a description of the acclimation process, and a program for daily monitoring of physiologic and behavioral indices, including definitive clinical criteria for temporary or permanent removal of an animal from the experimental protocol.
- Written records should be maintained for each animal in the animal housing room to document daily food and fluid consumption, hydration status, and any behavioral and clinical changes used as criteria for temporary or permanent removal of an animal from a protocol (Morton 2000; NRC 2003b).
- Additional details regarding species-specific protocol considerations and record-keeping requirements can be found in the species-specific appendices.

Section D – References and Acknowledgements

1. Clingerman KJ, Summers L. 2005. Development of a body condition scoring system for nonhuman primates using Macaca mulatta as a model. Lab Anim (NY) 34:31–36

2. Hickman, Debra L. and Melissa P. Swan. "Use of a body condition score technique to assess health status in a rat model of polycystic kidney disease." Journal of the American Association for Laboratory Animal Science: JAALAS 49 2 (2010): 155-9.

3. Institute for Laboratory Animal Research. (2003). Guidelines for the Care and Use of Mammals in Neuroscience and Behavioral Research. Washington, D.C. : The National Academies Press.

4. National Research Council. Guide for the Care and Use of Laboratory Animals: Eighth Edition. Washington, DC: The National Academies Press; 2011.

5. Ullman-Cullere, MH and CJ Foltz. Body condition scoring: A rapid and accurate method for assessing health status in mice. Laboratory Animal Science 1999, 49(3):319-323

6. United States Department of Agriculture. Animal Welfare Act and Animal Welfare Regulations. Washington, DC: APHIS; 2017.

7. This guideline contains information adapted from:
    a. Emory University Institutional Animal Care and Use Committee, "Food and/or Fluid Restriction" found at: http://www.iacuc.emory.edu/documents/352_Food_and_or_Fluid_Regulation.pdf
    b. Marquette University Institutional Animal Care and Use Committee, "Guidelines and Policy on Food or Fluid Restriction" found at: https://www.marquette.edu/orc/animal-careuse/documents/Food.Fluid.Restriction.2012.pdf
    c. Penn State Animal Resource Program, "Food & Fluid Restriction" found at: https://www.research.psu.edu/arp/experimental-guidelines/food-fluid-restriction.html
    d. University of California, Davis Office of Research, "Humane Endpoints for Laboratory Animals" found at: https://research.ucdavis.edu/policiescompliance/animal-care-use/iacuc/humane-endpoints-forlaboratory-animals/
    e. University of California, Irvine Office of Research, "Guidance Regarding Food or Water Restriction" found at: https://www.research.uci.edu/compliance/animalcare-use/research-policies-and-guidance/foodfluid-restriction.html

Approval Date	Change(s) Approved
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