

**University of Colorado Boulder, Office of Research Integrity
Institutional Animal Care and Use Committee
SOP #12
Title: Food and Water Restriction**

INTRODUCTION

This policy is intended to provide information on the requirements of food and water restriction and to establish procedures to be followed when restricting food and/or water (Guide, 8th edition, pages 30-31). Scheduled access or restriction of food or fluids may be necessary for the conduct of some research models.

Mammals and birds used for research and teaching are generally expected to have *ad lib* access to food and water. Reptiles, fish and amphibians may have different requirements, especially with regard to food availability, depending on species. Incidental food and water restrictions often occur when cages are transported or animals are placed in test chambers (usually less than two hours). These types of incidental restrictions of food and water do not require specific IACUC approval.

SCOPE

This policy applies to all animals used in research at University of Colorado Boulder. All planned restrictions or total deprivation of food and/or water require IACUC approval. All restrictions or total deprivation require scientific justification within an approved Animal Use Protocol.

POLICY

All food and fluid restriction (greater than 2 hours) are required to be described in a protocol and approved by the IACUC. For all cases of food or fluid restriction (with the exception of those incidental to transport), cages must be labeled with the time the restriction began, and when it is planned to end. The least amount of restriction necessary to achieve the scientific objectives should be used. If the restriction is a one-time removal of food and/or water (such as for surgery or single experimental event) greater than 24 hours for food and 12 hours for fluid, enhanced health monitoring is required due to the physiological impact of the restrictions on the animal and this must be described in the protocol. If the restriction will be required more than a single time, then enhanced monitoring, including logs, specific observations, and endpoints must be fully described in the protocol. **The amount of monitoring necessary for an animal undergoing a form of restriction is dependent on the length of time of food or fluid restriction and the efforts to ensure that the animal receives sufficient food and fluid when they are provided the opportunity to eat and drink.**

ALL animals that have water or food restriction as defined below MUST have their cages appropriately labeled with the contact person, contact phone number, time water/food was removed, and time water/food will be replaced.

- Water restriction is defined as water deprivation for longer than 12 hours. It should be noted that rodents, especially mice, can become dehydrated very quickly. Physiologically mice are not able to vomit and therefore would not benefit from water restriction prior to surgery like a larger animal, so water restriction for something other than a specific scientific reason is not recommended.
- Food restriction is defined as food deprivation for longer than 24 hours for simple stomach animals (not ruminants). It should be noted that rodents, especially mice, have a very high metabolism and gastrointestinal transit time. Therefore, they can be affected very quickly and significantly from food restriction. Physiologically mice are not able to vomit and therefore would not benefit from food restriction prior to surgery like a larger animal, so any food restriction for something other than a specific scientific reason is not recommended.

Options for monitoring food and water restriction

- Daily recording of food or fluid intake
- Recording of body weight at least three times per week - or more often for smaller animals, such as rodents. Weight log should be maintained in the room with the animals and available to the IACUC, Veterinary staff or other inspectors.
- Food is often restricted, for training purposes, and maintained at a specific percentage (i.e. 80%) of their starting weight. For growing animals, body weight will be compared to normal growth curves, not to the initial body weight of the animal.

- For water restrictions, where water is used as the motivator, personnel should monitor and record the specific volume of water consumed during training/experimental procedure. The animal should be given the opportunity after the training/experimental period to consume the rest of their daily water requirement prior to being placed on restriction again.

Other considerations

- Special attention should be given to ensure that animals consume a balanced diet, as food consumption may decrease with fluid restriction. A body condition scoring system should be considered to assist with assessing animals.
- In the case of conditioned-response experiments, use of a highly preferred food or fluid as a positive reinforcement instead of restriction is recommended.
- When administering compounds in drinking water, verify that animals are drinking enough to avoid dehydration. Unpalatable water might be refused.

SCIENTIFIC JUSTIFICATION AND MAINTAINING IACUC APPROVAL

In order for fluid restriction >12 hours and food restriction >24 hours to be approved by the IACUC, those restrictions or total deprivation for research purposes need to be scientifically justified and a program established to monitor physiologic or behavioral parameters, including criteria for removal of the animal from the experiment (such as weight loss or hydration status).

Monitoring

The protocol must clearly define the responsibilities and the schedule for monitoring, what criteria will be used to determine health status and when the animal needs to be brought to the attention of veterinary staff. Particular attention should be paid to the initial acclimation phase if the manipulation period will be on-going, and protocols should outline intervention endpoints, e.g., criteria indicating a need for increased food or fluid compared to the general population; how animals that are not adapting to the manipulation will be identified; and the disposition of such animals. Written records of all manipulations, observations, interventions, and veterinary evaluations must be kept and must be made available to veterinary staff, the IACUC, or other inspectors. Body weights should be recorded at a frequency determined by the amount of restriction. The plan for ensuring the animal's health during food or fluid restriction must be clearly described in the Animal Protocol.

CONSEQUENCES

Per regulatory requirements, failure to comply with this policy may result in notification of your funding agency (e.g. NIH) and regulatory agencies (e.g. USDA) that your research has violated federal and/or local policies regarding the humane use of animals. This notification may affect continuous funding of your animal-related research. Further, depending on the violation, you may be required to take additional training and/or your privilege to conduct animal research at UC Boulder might be temporarily suspended or even completely revoked.

DEFINITIONS

- Monitoring – a plan for oversight that includes observation and documentation of specific parameters with defined endpoints.
- Manipulation – the deliberate alteration of standard husbandry practices (e.g. feeding, fluid provision, modification of feed composition, administration of compounds in the feed or water, provision of fluids in place of water, or alteration of feeding schedules, etc.)
- Restriction – a reduction in the standard amounts of food or water provided.
- Intervention – treatment (including cessation of experimental manipulation) for animals that have met required endpoints, typically for loss or gain regarding weight or hydration status.
- Scheduled Access – animals consume as much as desired in regular intervals.

TRAINING: All personnel monitoring animals must be trained and proficient.

REFERENCES: *The Guide for the Care and Use of Laboratory Animals 8th Edition*, pg. 30-31