NU–IACUC POLICY

Northeastern University Institutional Animal Care and Use Committee

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| Policy on Food/Water Restriction or Deprivation |

Approval Date**:** 12/13/2022

**Background**

Regulation of food and water may be scientifically necessary to achieve desired experimental results but may have adverse effects on animals’ health and well-being. The Office of Laboratory Animal Welfare (OLAW) requires that the Institutional Animal Care and Use Committee (IACUC) evaluates the level of restriction, potential adverse effects, and methods for monitoring and evaluating the health of animals. *The Guide* (8th Edition) requires that the most minimal restriction is used to achieve the scientific necessity. Both the Animal Welfare Regulations (AWARs) (section 2.38(f)(2)(ii)) and the *Guide* allow the IACUC to approve exceptions to the standard feeding and watering requirements for animals, as long as they are scientifically justified and necessary for the purposes of the study.

**Definitions**

The IACUC defines the following terms and conditions for provisions of food/water:

Ad libitum or free access: A situation where animals have unfettered access to food or water. Ad libitum feeding is occasionally harmful to the well-being of animals (e.g. rabbits). In these cases, limited feeding shall be used to provide sufficient quantities and quality for normal growth and maintenance. Water may be provided ad libitum.

Restriction: Any provision of water or food that is less frequent or in less quantity than what is considered standard by DLAM/IACUC standard guidelines. Restricted water or food should not cause significant negative impact upon animal well-being as defined with measures of physiology, activity, and general body condition.

Deprivation: No intake of water/food for extended periods of time, which has the potential for a demonstrable impact upon animal well-being. Consideration must be given for minimum quantities of food and water/fluid required to sustain reasonably normal physiology within the time period.

*Water Deprivation*: defined as no intake for **more than**:

1. 8 hours: Rabbits
2. 24 hours: Rodents, and other species

*Food Deprivation*: defined as no intake for **more than**:

1. 16 hours: Rodents
2. 24 hours: Rabbits
3. Other species as per Veterinarian determination

**Policy**

The animal veterinary staff of Northeastern University’s DLAM determine what is considered the standard amount of food and water for each species for their respective animal programs.

Requirements for Restriction:

There are two primary reasons for the restriction of food and/or water, which have different approval requirements.

1. *Pre-Anesthetic fasting*: For some animals, food restriction is necessary to facilitate safe anesthetic induction and recovery. This is standard veterinary practice does not need to be approved in the IACUC protocol. Water should be available during the overnight fast but may be removed in the morning on the day of surgery.
2. *Rodents and rabbits*: pre-anesthetic fasting is not a clinical necessity, therefore does require protocol approval if scientifically necessary.
3. *Other species*: food may be withheld for up to 24 hours prior to anesthetic procedure (ie. overnight fasting).
4. *Restriction as Research Activity:* Food or water restriction can be a necessary component for certain types of research. For instance, it may be necessary to motivate the animals toward a desired behavioral goal. Restriction may be also used as a tool for assessing the effectiveness of research outcomes, clearance of the digestive system prior to experimental inoculation, restriction from experimental pair feeding, calorie restriction, etc.

The IACUC **must** approve exceptions to standard food and water provisions before an investigator can proceed with reduced food or water as a research activity. To obtain approval for restriction of food or water provisions, the protocol must include:

1. Scientific justification
2. A program to monitor physiologic and/or behavioral parameters
3. Specific criteria for removal of the animal from the study if humane endpoints have been reached (i.e., weight loss, hydration state, behavior change, etc.)

**Requirements for Deprivation**

Deprivation of food and/or water is considered a Category E activity. To obtain approval for deprivation of food or water, the IACUC requires:

1. Scientific justification that requires deprivation in order to achieve the research outcome.
2. Assessment by the IACUC of the ethical cost/scientific benefit prior to approval.
3. PI agreement to post notification of deprivation on the cage during the period of use. The PI will maintain a feeding/watering log that will be posted it the animal housing room and will be completed daily.
4. A specific monitoring plan in the protocol that includes physiologic and behavioral parameters such as weight loss, level of dehydration, decreased activity level, etc.
5. Specific humane endpoint criteria that require removal of the animal from the study. If the animal is not euthanized, a recovery plan must be provided which includes monitoring.

**Monitoring Requirements**

One cannot always predict if animals on a reduced schedule of food/water will develop problems. At a minimum, animals on a reduced intake (either quantity or frequency) of food or water should be monitored for:

1. Body Weight: Must be recorded on a regular basis, as defined in the protocol. Weights **must** be checked at least once a week.
2. Body Condition: Based upon a condition score for the species.
3. Behavioral Changes: Significantly decreased activity level.
4. Hydration Status: The following guidelines may be used to assess hydration status:

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| **% Dehydrated** | **Eyeball Position** | **Skin Remains Tented (seconds)** | **Mucous Membranes** |
| Normal | Normal | <1 | Moist |
| 1-5 | Normal | 1-4 | Moist |
| 6-8 | Slightly sunken | 5-10 | Tacky |
| 9-10 | Gap between eyeball & surrounding tissue | 11-15 | Tacky to dry |
| 11-12 | Large gap and very sunken | 16-45 | Dry |

Faerber, Hill, and Durrant. Equine Medicine and Management. Preston, ID: Animal Health Publications, 2001.

**Special Considerations**

* The PI is required to post and complete daily a food/watering chart in the animal housing room that allows husbandry and veterinary staff to ensure that animals are being provided food/water at intervals defined in the IACUC protocol.
* Certain animals (e.g. hibernating/estivating species) do not consume water/food for periods during their natural life cycle. The IACUC recognizes these specific stages of the life cycle as normal and thus these instances are neither defined as deprived nor restricted. Protocols involving these species will be reviewed by the IACUC on a case-by-case basis.
* For some species, especially rodents, restriction of water will concurrently cause the animal to eat less (and vice versa).
* It is important to consider the animals’ circadian rhythm when scheduling food/water removal. Nocturnal rodents eat and drink primarily during the dark cycle. Removing food/water in the evening for overnight restriction may result in much longer fast than anticipated as the animals may not have eaten during the previous day.

**References**

1. United States Department of Agriculture, 9 CFR Parts 1, 2, and 3.

2. PHS Policy on the Care and Use of Laboratory Animals, OPRR, 1996.

3. OLAW Web Site: http://grants.nih.gov/grants/olaw/

4. AAALAC Accreditation Guidelines: http://www.aaalac.org

5. 8th Edition: The Guide for the Care & Use of Laboratory Animals

6. Lab Animal (38)10: Oct 2009. Regulatory Issues Regarding the Use of Food and Water Restriction in Laboratory Animals

7. Duke Division of Laboratory Animal Resources Standard Operating Procedures

8. The Norwegian Consensus-Platform (Norecopa) Position Statements Fasting in Rodents