

Title: Food and Water Restriction and Manipulation in Research Animals and Guidelines for Weight Loss and Gain
IACUC Administrative Policy P-002-03

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Authorized by:
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I. PURPOSE

While food and water restriction can be an important and commonly used research tool in many experimental studies, this restriction may adversely affect an animal's well-being. In keeping within federal and university guidelines, and policies to minimize pain, distress and discomfort of animals used in research, experiments requiring food or water restriction or manipulation require prior review and approval by the IACUC.

Even when food and water restriction are not employed, animals may lose or gain weight on some diets and/or protocols. However, the extent and rate of weight loss or gain should not compromise the health and well-being of the animal. Body Condition Scoring (BCS) can be used to guide the Principal Investigator/Project Director (PI/PD) and animal care staff when determining if an animal should be removed from the study and is preferable to using weight changes alone which may underestimate the impact of tumor burden or other conditions. For details on end stage illness, please refer to the guidelines on Animal Pain and Distress Management (P-0010-01) and Euthanasia (P-009-01).

II. PROCEDURES

Monitoring weight loss/gain:

- The PI/PD should describe the approximate weight and age at which anticipated weight loss will begin and the point at which the study or animal will be terminated. **For young growing animals, excessive weight loss for all species must be justified.**
- When determining an acceptable weight range for animals obtained from commercial vendors, or their offspring, charts and tables provided by the vendor should be used for guidance. Guidance on weight loss in rodents and rabbits has been published to assist in assessing and avoiding severe consequences during scientific procedures.
- Obesity is a consequence of some protocols and the extent of weight gain should be considered relative to the length of the study, age and species of the animal. Excessive weight gain must be justified.
- Body Condition Scoring provides a more objective alternative to assess weight loss or gain. For details see BCS chart provided below.

Food and Water Restriction/Manipulation:

Restriction is defined as a limitation on *ad libitum* access to food or water. Described in terms of either amount of food or water provided on a daily basis (volume or weight) or amount of time daily that an animal is given access to food and/or water.

Manipulation is defined as a change in the composition of the normally offered food or water. This is usually accomplished by altering the diet composition or consistency by adding or deleting nutrients to create an animal model or adding compounds/medications to food or water for animal consumption. Based on the guidelines below, animals that do not have access to food or water for at least the periods outlined below are defined as restricted:

Food Access

- 18 hours daily: Rodents, Birds
- Once daily: Most other mammals

Water Access

- *Ad libitum*: Birds
- 18 hours daily: Rodents, Rabbits
- One hour, twice daily: All Other Mammals

Note: Immature animals and those adults who are not healthy will be evaluated on a case-by case basis.

Food and water provisions to animals outside of the recommendations above constitute *restriction and must adhere to the following guidelines:

- Food and/or fluid restriction that deviates from the guidelines above should be described and scientifically justified in the IACUC application.
- The PI/PD is responsible for assuring that specially formulated diets are nutritionally adequate and palatable, unless otherwise scientifically justified.
- The PI/PD must describe the monitoring that will be performed and its frequency to ensure animal health.
- The shortest period of restriction to achieve the scientific objective should be used.
- Animals should be acclimated gradually to new restriction paradigms.
- Endpoints should be established so that if an animal's health is threatened, a plan is in place to remove the animal from the food or fluid restriction.
- Pre-anesthetic fasting is not recommended for rodents or rabbits.

*Note: Use of prolonged restriction may result in animals being placed in humane use category E as determined during IACUC review.

III. SPECIAL INSTRUCTIONS

A Body Condition Scoring (BCS) diagram should be used in combination with weight changes, behavioral assessment and any clinical information for a complete assessment of an animal's health status.

IV. REFERENCES

Jones, Oates, Trussell. (1998) an applied approach to the assessment of severity.
Humane Endpoints in Animal Experiments for Biomedical Research

Paster EV, Villines KA, Hickman DL. Endpoints for mouse abdominal tumor models: refinement of current criteria. *Comp Med* 2009;59:234-241.

United Kingdom Co-ordinating Committee on Cancer Research (UKCCCR) Guidelines for the Welfare of Animals in Experimental Neoplasia (Second Edition). *Br J Cancer* 1998;77:1-10.

Ullman-Cullere MH, Foltz CJ. Body condition scoring: a rapid and accurate method for assessing health status in mice. *Lab Anim Sci* 1999;49:319-323.

Wallace J. Humane endpoints and cancer research. *ILAR J* 2000;41:87-93.

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