Title: Food and Fluid Restriction
Policy Number: 36
Policy Intent: This policy is intended to define the regulation and restriction of food and fluids for Principal Investigators during research endeavors that have been set forth by the IACUC at TTU

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1. Purpose

A. The purpose of this policy is to define and establish standards and exceptions for food and fluid regulation, restriction, and fasting for animals housed at TTU. Food and fluid regulation and restriction is a common experimental tool that may affect the animal's well-being and may require justification before approval by the IACUC. The objective of these studies using food and fluid restriction and regulation should be planned and executed to use the least restriction necessary to achieve the scientific objective while maintaining animal well-being (*The Guide to the Care and Use of Laboratory Animals*).

2. Background

A. 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, and methods for assessing the health and well-being of the animals.
B. The following factors influence the amount of food or fluid restriction that can be safely used in a specific protocol: the species, strain, or stock, gender, age of animals, thermoregulatory demand, type of housing, time of feeding, nutritive value, fiber content of the diet, and prior experimental manipulation.
C. The degree of food or fluid restriction necessary for consistent behavioral performance is influenced by the difficulty of the task, the individual animal, the motivation required of the animal, and the effectiveness of animal training for a specific protocol-related task.

3. Policy

A. It is TTU IACUC's policy that animals have free access to food and water at all times. It is recognized that some experimental procedures require the need to regulate or restrict access. When access to food is removed for a period greater than 6 hours the IACUC considers it an exception and requires justification in the IACUC protocol. Animals must always have access to water unless justified and approved in the IACUC protocol.
    1) Ad libitum: The animal always has free access to food and water.

2) Regulation: A deviation from the standard husbandry practices in the amount or availability of food or water.
3) Scheduled: Scheduling of access to food and water limits the number of times or a length of period during which the animal has access to feed and water, so that the animal consumes a normal portion, but at intervals or durations that differ from standard husbandry practices. Scheduled feeding is not expected to result in a subnormal body weight.
4) Restriction: The provision of rations such that the volume of food or water is strictly monitored and controlled.
5) Fasting: the removal of food and or fluid for a certain period of time prior to experimental manipulation.

B. Deprivation of food or water shall not be used to train, work, or otherwise handle animals; provided however: that the short-term withholding of food or water from animals, when specified in an IACUC-approved protocol activity that includes a description of monitoring procedures.
C. Experiments on rodents should be planned so that the fasting period starts in the morning, and the experimental manipulation occurs in the afternoon. This is because removing food "overnight" can have adverse effects as often rodents eat during the dark phase of the light cycle.
    1) If food does need to be removed prior to leaving the lab for the evening, a small portion of food that will be consumed over the next few hours (e.g. a few pellets) may be left on the cage floor.
D. The approved IACUC protocol should include:
    1) Justification for the need to regulate/restrict food and/or water
    2) The type and length of regulation/restriction
    3) Animal health monitoring procedures and frequency (e.g. body weight, body scores, blood urea nitrogen, urine/fecal output, food/fluid consumption, behavioral changes)
    4) Body weight must be measured at minimal weekly when rations are regulated.
    5) Methods of ensuring adequate nutrition and hydration during the regulated period
    6) Intervention criteria or removal from study points
E. Pain/distress and potential adverse consequences
    1) The IACUC should consider if food or fluid restriction causes distress. Alteration of a normal food or fluid schedule is not inherently associated with unrelieved pain or distress. If it is determined no adverse consequences are expected, it can be categorized as a Class C; however, if distress and adverse consequences are caused by the restriction, it may be categorized at a higher pain/distress level.
    2) The potential adverse consequence both intentional and unintentional should be described and considered.
    3) Intervention and/or endpoint criteria should be defined in the approved protocol.

4) Animals without water for longer than 12 hours must be listed in Category E.

F. The policy does not apply to the following and therefore does not require justification in the IACUC protocol:
   1) Pre-surgical, pre-anesthetic fasting with access to water is the veterinary standard for larger species. Small research animals are not typically fasted before surgery. Therefore, pre-surgical fasting of these animals must be justified in the IACUC protocol.
   2) Standard production methods such as controlled feeding or limit feeding as long as all nutritional and caloric needs are met or per the recommendations of the food supplier.
   3) Animals under veterinarian directive to decrease body condition or another veterinary condition necessitating nothing per os (NPO).
   4) During shipping and/or transportation.

4. References

- Jensen, TL, MK Kiersgaard, DB Sorensen, and LF Mikkelsen. 2013. Fasting of mice: a review. Laboratory Animals. 2013. 47 (4). 225-240.
- Guide for the Care and Use of Laboratory Animals, 8th ed, National Research Council, National Academy Press, 2011