The Institutional Animal Care and Use Committee (IACUC)

Weight loss in research animals

Investigators are responsible for monitoring animals for potential health issues, including weight loss. Weight loss may occur rapidly when animals display additional conditions that could interfere with eating and/or drinking (e.g. difficulty with ambulation).

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. In instances where weight loss is anticipated due to a restricted caloric intake, the research personnel should closely monitor animals to ensure that food and fluid intake meets their nutritional needs. Body weights should be recorded at least weekly and more often for animals requiring greater restrictions. Research personnel should maintain written records for each animal to document daily food and fluid consumption, hydration status, and any behavioral and clinical changes used as criteria for removal of the animal from the protocol.

Ideally, the diet restriction should be limited so that the body weight is reduced no more than 10% per week. The maximum percentage of body weight loss while an animal is on a restricted caloric intake should not exceed 20% of its initial body weight. Some animals on a controlled fluid access paradigm may decrease their total caloric intake in response to changes in their access to water. In most cases where fluid access is controlled, the decreased caloric intake is minor and does not result in a body weight loss greater than fifteen percent.

In conjunction with recorded weight loss, a rapid, practical, and objective health assessment is the body conditioning score (BCS). The BCS is particularly useful where there is a decrease in the body condition without a corresponding loss of body weight. Relevant information for various species may be referenced below:

- Canine
- Feline
- Ferret
- Guinea Pig
- Rabbit
- Swine
Mouse and Rat

**BC 1**
Mouse is emaciated.
- *Skeletal structure extremely prominent; little or no flesh cover.*
- *Vertebrae distinctly segmented.*

**BC 2**
Mouse is underconditioned.
- *Segmentation of vertebral column evident.*
- *Dorsal pelvic bones are readily palpable.*

**BC 3**
Mouse is well-conditioned.
- *Vertebrae and dorsal pelvis not prominent; palpable with slight pressure.*

**BC 4**
Mouse is overconditioned.
- *Spine is a continuous column.*
- *Vertebrae palpable only with firm pressure.*

**BC 5**
Mouse is obese.
- *Mouse is smooth and bulky.*
- *Bone structure disappears under flesh and subcutaneous fat.*

A "+" or a "-" can be added to the body condition score if additional increments are necessary (i.e. ...2+, 2, 2-...)

The following conditions apply when anticipating weight loss in research animals.

- Anticipated weight loss over 10% due to experimental manipulation must be scientifically justified and described in the approved Animal Care Application (ACAP). The investigator must measure an initial baseline weight and must monitor and record subsequent weight loss.

- Weight loss as part of conditioning experiments may be as high as 20% of free fed weight if justified and appropriately monitored.

- Anticipated weight loss greater than 20% requires a request for exception to the IACUC policy (Exception reference HERE) and will only be approved by the IACUC under special circumstances and if scientifically justified.

- Weight loss studies in obese animal models should be designed in consultation with a veterinarian. The veterinarian will assist with determining the goal weight as a greater weight loss may be necessary to achieve the study goals.

- Developing animals have increased dietary requirements to ensure normal growth. Controlled diet in growing animals may prevent normal growth while not resulting in an overall weight loss. Weight loss in excess of 10% in growing animals indicates a more severe stress than a comparable weight loss in an adult animal and should be brought to the attention of the veterinary staff.

The USDA and PHS policies require proper documentation of animal care and use to assess compliance with research protocols and clinical care procedures. Dates of all observations, treatments, and procedures must be recorded. Dates and times (including AM/PM) of all time-sensitive observations or treatments (post-operative evaluations, pain medication) must be recorded. Extent of records vary based on the nature of the procedure; however, at a minimum, records of the procedure must consist of: Animal ID, date of procedure, type of procedure, anesthetics/analgesics used (dose, route, time), anesthesia chart (vital signs – e.g. pulse rate, heart rate), drugs given (dose, time), general procedures (e.g. intubation, beginning and end of surgery, etc.). Any deviations from the procedure as approved in the protocol due to emergency need must be documented, explained, and reported to the Office of Animal Care and Use. All records must be available for review at any time by IACUC and external regulatory officials.

References:
1. Guide for the Care and Use of Laboratory Animals (8th Edition)
2. Guidelines for Diet Control in Behavioral Animal Studies: National Institutes of Health, Office of Animal Care and Use
3 Guidelines for Assessing the Health and Condition of Mice, Volume 28, No. 4 Lab Animal, April 1999

4 Body Condition Scoring: A Rapid and Accurate Method for Assessing Health Status in Mice, Laboratory Animal Science by the American Association for Laboratory Animal Science, Vol 49, No 3, June 1999

5 Guidelines for Endpoints in Animal Study Proposals: National Institutes of Health, Office of Animal Care and Use

Disclaimer: if your experimental procedure requires a significant deviation to this Standard Operating Procedure (SOP), please amend your application(s) to include Addendum 8.0 Request for Exception to Policy and indicate the following: a description of the exception; the rationale (provide scientific justification and/or justification based on animal welfare); the potential adverse effects/clinical signs resulting from the exception; and specify which (and the total number of) animals in the approved protocol that will be affected. The IACUC will review your request at the next monthly meeting.