



**THE UNIVERSITY OF HOUSTON
IACUC POLICY**

Title: Food and Water Control Policy for Nonhuman Primates

	10-12-15
IACUC Chair	Date approved
	10-12-15
Director of Compliance	Date approved

The University of Houston’s Institutional Animal Care and Use Committee (IACUC) accepts the need to regulate access to food or water to motivate primates to participate in behavioral tasks. However, prior to instituting food/water control, Principal Investigators (PI) must consider alternatives to food or water control and scientifically justify need in the IACUC-approved protocol. Any scheduling or control policy must also be reported to USDA as an exemption on the Annual Report. Any policy wherein Nonhuman Primates (NHP) do not receive a minimum amount of food and water daily (minimum amounts defined below) must be additionally justified in the protocol and must be reported to USDA on the Annual Report in Category E (experiencing *unrelieved distress*). The IACUC encourages investigators to provide food or water in excess of these minimums whenever possible and to use the least food/water control that will achieve the scientific objective.

DEFINITION OF FOOD OR WATER CONTROL

Depending on activity level, immature macaques require 110 kilocalories per kilogram of body weight, and adult macaques require 65 kilocalories per kilogram of body weight for maintenance (Knapka 1995). Water must be available at all times. **Any animal that does not receive these minimum amounts of food and ad libitum water every day is defined to be ‘Food-controlled or ‘Water-controlled. Furthermore, animals may not be ‘food-controlled and ‘water-controlled’ simultaneously.**

MINIMUM FOOD REQUIREMENTS

The IACUC requires immature macaques (juveniles <5 years old) that are food-controlled to receive a minimum of 55kcal/kg of mean body weight per day and adult macaques to receive a minimum of 33kcal/kg of mean body weight per day. On each non-working day (for example, weekends), animals should be provided with food at a minimum of 110 kcal/kg of mean body weight per day. *For the animals that are food-controlled, the investigator is required to enter the animal’s daily intake in the Food Control Log attached to this document.*

MINIMUM WATER REQUIREMENTS

In general, NHP fulfill their daily water requirements (sensible and insensible losses) with 20ml/kg body weight. **The IACUC requires that each NHP either earns or is supplemented to no less than 20ml/kg of mean body weight each day. On each non-working day (for example, weekends), animals should be provided with water at a minimum of 80ml/kg of mean body weight per day.**

Water equivalents of fruit or vegetables maybe used to partially meet the NHP's fluid requirements. As identified in people, 20% of the daily water intake is generally obtained from food (Food

and Nutrition Board 2004). Water equivalents can be found in *Bowes and Church's Food Value of Portions Commonly Used* (18th edition, Pennington JAT and Douglass JS, ed., Lippincott, Williams and Wilkins: Philadelphia, 2005). Therefore, no more than 20% of the minimum daily water requirements may be provided in the form of fruits/vegetables. The fluid content in fruit or vegetables is dependent on the weight of the individual piece of food so the Investigator must calculate this each time fruit or vegetable are used to meet an animal's daily minimum requirement and record the calculated fluid content on the Water Control Log in the housing room. *For the animals that are water-controlled, the investigator is required to enter the animal's daily intake in the Water Control Log attached to this document.*

MONITORING AND REPORTING REQUIREMENTS

It is expected that animals that are under food/water control policy continue to thrive and grow similar to animals that are not being food/water controlled. Studies have established standard weights for normally developing male and female NHPs. Therefore the health and development of animals that are being food/water controlled must be monitored by acquiring animal weights periodically. In addition to animal weights, a body condition scoring method is also a valuable tool in assessing animal health and must be used to monitor the animal. Recording of animal weights is the responsibility of the PI and recording of body condition scores is the responsibility of ACO.

Monitoring of animals weights

Prior to commencing any food/water control, a baseline weight of the animal must be acquired. The baseline weight of the animal is calculated as the average weight over several days while the animal is not food/water controlled. **Researchers must weigh food/water controlled NHP's at least once per week and are encouraged to weigh them more often if possible. At no time should the animals' weight be more than 15% below his baseline weight. The baseline weight must also be adjusted upwards once a month to account for the increasing age and growth of the animal.** A suggested method to perform this monthly adjustment is to record the animals' baseline weight on the standard growth chart for male or female rhesus monkeys and to establish the animals' normal development curve. Then the "normal baseline weight" can be read off the growth curve. A copy of the standard growth chart is available as an excel file link on the IACUC Policy webpage. The PI must adjust the minimum daily water and calorie amounts each month based on the new monthly baseline weight. The animals' measured weight along with the monthly baseline weight must be recorded in the Food or Water Control Log in the animal housing room. Amounts of food or water that the animal earned in the laboratory and were given in the cage must be recorded in the Food or Water Control Log daily.

Body condition score

Body condition score (BCS), as defined by Clingerman (2005), is assessed by ACO veterinarians and must be obtained at a minimum semi-annually. All NHPs at the University should be maintained at a lean to optimal body condition score (BCS) of 2.5-3 (Clingerman 2005). An animal with a body condition score above 3.5 is overweight, and the investigator should contact ACO in order to develop a weight reduction program. A score below 3 ranges from lean (2.5), to thin (2.0) to emaciated (1.0). While the IACUC accepts that some retardation may occur in young animals under food/water control, young animals are still expected to grow and maintain a body condition score above 2.0. Investigators must provide scientific reasons in their protocol to maintain an NHP at a body condition score below 2.0 as an exemption to this policy.

Identification of weight loss of >15% of baseline weight or BCS measure of < 2.0 is immediate cause for removal of the animal from food/water control.

ADDITIONAL NOTES

1. Animals may not be both food and water controlled simultaneously, and the IACUC requires an animal be transitioned to *ad lib* food and water and be maintained *ad lib* for at least one week before being changed from food control to water control, or vice versa.
2. THE IACUC requires that all NHPs undergoing major invasive surgery be transitioned to *ad lib* water and food by the day prior to surgery. Fasting prior to surgery should be limited to the least amount of time required (generally 6 to 16 hours). The animal must be maintained on *ad lib* food and water for at least one week following the major invasive surgery or as long as drugs requiring free access to food and water for appropriate metabolism (i.e. NSAIDs, certain antibiotics) are administered, whichever is longer.
3. To prevent water intoxication and cerebral edema or gastric upset and bloat associated with large volumes of water or food, if fluid intake is controlled at a minimum level of 20-30 ml/kg, NHPs must be transitioned to an *ad lib* schedule over a period of 1-3 days since food or water scheduled animals may initially consume large volumes of food or water following a return to an *ad lib* schedule. The greater the level of food/water control, the longer the transition period should be. ACO should be consulted immediately if an NHP displays any abnormal behavior, vomiting or diarrhea, incoordination, or collapse during the transition period.

REFERENCES

- 1) Animal Welfare Act as Amended. 2007. 7 USC §2131-2156.
- 2) Animal Welfare Regulations. 2008. 9 CFR §3.129.
- 3) Clingerman KJ, Summers I. 2005. Development of a body condition scoring system for nonhuman primates using *Macaca mulatta* as a model. *Lab Anim* 34(5):31-37.
- 4) Food and Nutrition Board. 2004. Dietary Reference Intakes: Water, Potassium, Sodium, Chloride, and Sulfate. <http://liiom.edu/Reports/2004/Oietary-Reference-Intakes-Water-Potassium-Sodium-Chloride-andSulfate.aspx>
- 5) Institute for Laboratory Animal Research. 2003. Guidelines for the care and use of mammals in neuroscience and behavioral research. National Academies Press: Washington DC. [http://grants.nih.gov/grants/olaw/National Academies Guidelines for use and care.pdf](http://grants.nih.gov/grants/olaw/National%20Academies%20Guidelines%20for%20use%20and%20care.pdf)
- 6) Institute for Laboratory Animal Research. 2011. Guide for the care and use of laboratory animals. 8th ed. Washington (DC): National Academies Press.
- 7) Knapka JJ, Barnard DE, Bayne KA, Lewis SM, Marriott BM, Oftedal T. 1995. Nutrition. In: *Nonhuman Primates in Biomedical Research: Biology and Management*. Bennett BT, Abee CR, Hemickson R, ed. Academic Press: San Diego, CA.

WATER CONTROL LOG MEAN BODY WEIGHT

Principal Investigator: _____ Protocol Number: _____

Animal ID: _____ Bldg & Rm Number: _____

DATE	WATER Earned in Lab	WATER Supplemented in Cage (ml)	NON-WATER Supplements (ml)*	WEIGHT (KG)	INITIALS

- Calculate fluid content of each fruit/vegetable provided if intended to meet minimums.

**FOOD CONTROL LOG
MEAN BODY WEIGHT**

Principal Investigator: _____ Protocol Number: _____

Animal ID: _____ Bldg & Rm Number: _____

DATE	FOOD Earned in Lab (kcal)	FOOD Supplemented in Cage (kcal)	Supplements (kcal)	WEIGHT (KG)	INITIALS

- Calculate kcal content of each supplement provided if intended to meet minimums.