

CONFIDENTIAL**POLICY ON FOOD AND FLUID REGULATION****1. Policy statements**

This policy outlines the standards and expectations for researchers performing food and/or fluid regulation for research purposes. In accordance with the Guide, the least amount of regulation necessary to achieve the desired result must be used.

2 Definitions

<i>Ad libitum</i>	Unrestricted food and fluid consumption
Food/Fluid regulation	Any deviation from normal daily intake of food and/or fluid. It includes scheduled and restricted access, as defined below
Restricted access	Total volume of food and/or fluid consumption strictly monitored and controlled
Scheduled access	Normal daily consumption of food and/or fluid consumption limited to regular intervals

3 Scope

This policy applies to all species used for research, testing and teaching in NUS. It is not applicable to fasting of non-rodent species as part of routine preparation prior to anaesthesia and/or surgical procedure, or clinical/veterinary care activity.

4 Guidelines**4.1 IACUC protocol requirements and scientific justifications**

Any food/fluid regulation procedures must be included in the IACUC protocol, scientifically justified, and approved before being implemented. The protocol must identify and scientifically justify the details of food/ fluid regulation. Food and fluid restriction must not compromise the health of the animals.

Protocols involving food or fluid regulation must include the following information:

1. A clear description of the proposed food/fluid regulation including:
 - a. feeding/drinking schedule
 - b. frequency of regulation
 - c. length of regulation/restriction
 - d. personnel responsible for the experiment
 - e. level of food/fluid regulation (for example, percentage range of the amount of food/fluid being restricted, calculated from a baseline level of normal daily consumption)

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2. Any potential adverse consequences of the regulation/restriction, and planned intervention
3. The parameters and frequencies of monitoring for the health and well-being of the animals
4. Criteria for temporary, or permanent, removal from diet regulation, and humane endpoints
5. how the fluid balance and/or body weight will be monitored, recorded and maintained consistent with the limits approved by the IACUC.

4.2 Considerations for the level of regulation and manipulation

Food and/or fluid regulation requires special IACUC considerations due to its potential impact on animal well-being.

Food and fluid restriction should be limited to the shortest period possible for the conduct of the research. Animals should be given sufficient time to acclimatise to food/fluid regulation schedules. For example, food/fluid may be gradually changed for the animals to adjust to the restriction. In accordance to the *Guide*, the least amount of regulation necessary to achieve the desired outcome should be used. Experiments involving the withholding or severe restriction of food or water should produce no enduring detrimental effect on the animals, and must be kept to a minimum. If an inducement is needed to modify behaviour, it should be as mild as possible. Severe water, food, social or sensory deprivation should not be used.

Normal daily intake values should be used as a basis for baseline consumption. For example, daily consumption values may be determined from the animal's own baseline, animals of the same strain, background, sex and age as those used in the study, or from published data.

Food/fluid regulation is strongly discouraged for young, developing and pregnant animals. The protocol must specifically justify the rationale for performing food/fluid regulation on these animals.

If an alternative to food and fluid restriction is available (e.g. food rewards for positive reinforcement in behavioural research), it should be used with priority over food and fluid restriction. The PI should provide scientific justification in the protocol for why positive reinforcement could not be utilized in lieu of food or fluid regulation.

4.3 Animal monitoring and record keeping

Animals on food and/or fluid regulation must be monitored daily (including weekends and holidays), and weighed at least once per week. Monitoring requirements may vary depending on the individual protocols. For example,

1. Animals undergoing a single fasting episode for behavioural tasks may not be monitored daily
2. Food intake on non-fasting days may not be measured
3. General monitoring plans, as indicated in the approved protocol, may replace these requirements when the fasting period ends

The researchers must keep a written record for animals undergoing food/fluid restriction in the vivarium. Amount of fluid/food intake and/or body weight must be monitored, recorded and maintained within the limits approved by the IACUC. Body weight records and fluid/food intake records should remain with the animals in the holding facility. All records must be maintained, made available to the IACUC, PAM officers and/or CM staff, and should include at least the following, or as required by the study:

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1. The baseline weight of the animal before being placed on regulated food and/or fluid
2. Amount of food and/or fluid, provided and consumed
3. Hydration state
4. Body weight of individual animals, at least once weekly, or more frequently for animals requiring greater restriction
5. Any behavioural and clinical changes used as criteria for temporary or permanent removal of an animal from food/fluid regulation. Researchers may refer to CM SOPs on food and fluid regulation, or approach CM veterinarians for further discussion.

When animal welfare is compromised, for example, exhibiting clinical symptoms of ill health or behavioural abnormalities, the Attending Veterinarian (AV) or designee may remove the animal from regulation even if the protocol's criteria have not been reached.

4.4 Other requirements

Researchers must contact CM Operations for discussion before the start of experiments involving food/fluid regulation.

The information of when animals are undergoing regulation, and/or interval and schedule of regulation should be available, at least at the room level.

Researchers must tag each applicable cage with a "*Special Instruction*" card to indicate information regarding the regulation.

When food/fluid is not available outside the restriction period, CM may make reasonable attempts to contact the researcher, or to provide food/fluid.

5. References

1. Guide for the Care and Use of Laboratory Animals. National Research Council, 2011.
2. Guidelines for the Care and Use of Mammals in Neuroscience and Behavioural Research. National Research Council, 2003.

6 Related documents/SOPs

1. CM SOP 408: Non-Human Primate Water Restriction and Scheduling

Revision	Author	IACUC approval date
Last reviewed	Dr Foo Tet Wei, John	13 August 2013
P219.01. Revisions to:	Dr Chew Li Li	3 January 2023
1. ensure policies are in compliance with the NAELAR Guidelines 2022 and the updated Animals and Birds (Care and Use of Animals for Scientific Purposes) Rules 2004; and	IACUC	
2. up-to-date with current practices		
Changes made to:		
1. section 4.1 to add "Food and fluid restriction must not compromise the health of the animals"; and point 5 "how the fluid balance and/or body weight will be monitored, recorded and maintained consistent with the limits approved by the IACUC."; and updated to "		

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2. section 4.2 to add "Food and fluid restriction should be limited to the shortest period possible for the conduct of the research.", "Experiments involving the withholding or severe restriction it should be as mild as possible. Severe water, food, social or sensory deprivation should not be used." and updated to "If an alternative to food and fluid restriction is available (e.g. food rewards for positive reinforcement in behavioural research), it should be used with priority over food and fluid restriction."; and
3. section 4.3 to add "Amount of fluid/food intake and/or body weight must be monitored, recorded and maintained within the limits approved by the IACUC. Body weight records and fluid/food intake records should remain with the animals in the holding facility."

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