



This document has been developed by The Australian National University's (ANU) Research Ethics Office. It has been endorsed by the ANU Animal Ethics Committee (AEC). It is designed to provide guidance regarding current best practice to institutional animal users and carers on the care and use of animals for scientific purposes. It has been prepared in consultation with the Australian code for the care and use of animals for scientific purposes 8th edition 2013.

Document 017: Guideline for Acclimatisation of Rodents V2.0

Background

When animals are moved into a new area or transported, even over short distances, they experience a period of stress that may impact their welfare and even the experimental outcomes.

It has been proven that the immune system, neuroendocrine system, and many physiological parameters can be impacted in the short term. These can affect short-term responses to experimental drugs or other interventions.

It is recommended that animals are provided with sufficient time to acclimatise to their new environment and recover from the stress of transport. The period of time recommended for acclimatisation and return of homeostasis is related to the duration of transportation and the magnitude of differences between the origin and destination environments.

General Information and Considerations

Stress to the individual animal may be caused by changes in temperature, equilibrium, vibration and sense of movement, lighting, airflow, and reduced oxygen availability. Separation from cage mates, reduction in availability of water from normal sources, unusual noises, scents, and a new cage environment may also be sources of stress.

Scientific evidence shows there are physiological changes that affect plasma cortisol levels, leukocyte l activity, and haemagglutination parameters, and reproductive performance and body weight may be negatively affected.

The gut microbiome may also vary significantly between animal facilities, and it may be that phenotypes and experimental parameters are difficult to replicate once animals are moved between different facilities, depending on the barrier conditions, bedding, and changes to diet.

The age, genotype, health status, and animal's potential previous exposure to the stress of transport will lead to a variation in the animal's response, and should all be considered when assessing potential impact.

It is important that research groups undertake their own research to determine how transport and change in environment may affect animals in their studies, and

appropriately time the transport of their animals with the expected start date of experiments.

Monitoring, Intervention and Reporting

Animals must be fully examined after arrival at a new facility (either after import or transport from another facility). This examination should include:

- Assessing animal welfare
- Confirming the sex, strain, appearance, and age of the animals as per the order record and labelling on the shipper
- Cross-checking the delivery information with the animal(s) received
- Confirming the availability of food and water once the animal is housed in its new cage

Rodents must be monitored daily post transport. This monitoring does not require a specific score sheet unless any abnormalities are noted at any stage.

Animal deaths or other welfare concerns arising during transport must be reported as an Unexpected Adverse Event as per the University's procedure.

Minimum Requirements

- Even when conducting non-survival experiments, the impact from the stress of transport and change in environment needs to be considered for all animal-based work.
- Each day of acclimatisation should be an entire day of rest. For example, if one day acclimatisation is recommended, then an animal that arrives at a facility on a Tuesday should not be utilised until the Thursday to allow for the Wednesday to be a full one-day acclimatisation period.
- For animals transported from one facility on campus to another nearby facility or even transported within the same facility, the AEC recommends a *minimum* of one day acclimatisation.
- For animals transported within Canberra but outside of the ANU campus, the AEC recommends a *minimum* of three days acclimatisation.
- For animals transported outside Canberra but within Australia, the duration of the journey is likely to be many hours at a minimum, and the AEC recommends a *minimum* of four days acclimatisation.
- For animals transported overseas and by air freight, the AEC recommends a *minimum* of seven days acclimatisation.
- To minimise the impact of movement between facilities at ANU and ACT Health animal facilities, the facilities should have similar temperature and humidity settings whenever possible, as well as similar home cage environments.

Exceptions

In all circumstances, research groups should attempt to meet the above recommendations. Where experiments must be undertaken urgently, or if the above recommendations cannot be met, it is a requirement that the research group considers the increased risk of variability of research results. It is not acceptable to risk animal welfare

or research quality to be able to achieve quick research results. Any exceptions must be discussed with ANU veterinarians with consideration to welfare and research quality.

Minimising Stress

The transport of animals must be undertaken within the AEC Approved Document_002_Guidelines for Animal Transportation. These include the requirement to minimise stress to the animals by avoiding extremes in temperature, duration, and mixing animals unfamiliar with each other, providing lower light levels, minimising unnecessary vibration, and ensuring the animals are accompanied at all times.

In addition, habituating animals to the stresses of handling and transport from early life increases the speed of recovery from transport stress.

References and Resources

NHMRC. Australian code for the care and use of animals for scientific purposes 8th Edition 2013 (updated 2021) (Section 3.2.10-12) <https://www.nhmrc.gov.au/about-us/publications/australian-code-care-and-use-animals-scientific-purposes>

ANU. Procedure for Managing & Reporting Unexpected Adverse Events
<https://services.anu.edu.au/research-support/ethics-integrity/animal-ethics-policies-guidelines-and-forms>

ANU. AEC Document 002_Guidelines for Animal Transport
<https://services.anu.edu.au/research-support/ethics-integrity/animal-ethics-policies-guidelines-and-forms>

Montonye, D.R. et al (2018) Acclimation and Institutionalization of the Mouse Microbiota Following Transportation
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5985407/>

Obernier, J.A. & Baldwin, R.L. (2006) Establishing an Appropriate Period of Acclimatization Following Transportation of Laboratory Animals
<https://academic.oup.com/ilarjournal/article/47/4/364/810898>