

Terms of Reference

FELASA Working Group on Methodology for Health Monitoring of mice maintained in IVCs

Background

To preserve animal welfare and the reproducibility of experimental data, the Dir. 2010/63/EU requires research establishments to monitor laboratory animals' health. Historically when housing was done almost exclusively in open cages, FELASA recommendations proposed techniques mainly relying on sentinels on dirty bedding and samples from euthanized animals. This strategy allows the detection of pathogens and the constitution of the colony's microbiological status. Therewith, clinical examinations, autopsies and histopathology of macroscopic lesions complete the health monitoring strategy and allow a global assessment of the colony's health, and not only of its microbiological status.

New challenges appeared with the housing of mice in Individually Ventilated Cages (IVC), since the equipment is designed to reduce the spreading of microbes (i.e. virus, bacteria, parasites and fungi). New sampling strategies rely on the use of environmental samples (e.g. from cage, plenum, or exhaust air dust) to mitigate the risk of false negatives due to the lack of microbial transmission between colony and sentinel animals housed in IVC. The development of sampling techniques allowing detection of microbes from live animals (e.g. for blood samples, swabs and faecal pellets) is also a turning point for the reduction of the number of animals euthanized for health monitoring purposes. Sampled animals may be retired breeders, healthy colony animals, animals with clinical signs or sentinels, tested at regular intervals during the life time of a sentinel.

These more exhaustive strategies optimize the investigation of the microbiological status, and this is consistent with the importance of the objectives. However, despite the reduction of sentinel numbers, additional animals may be sampled and some of them may be sampled several times. Also, the use of environmental samples may not replace animal samples for all microbes of interest. There are therefore some 3Rs considerations that should be discussed when setting up a screening strategy. Finally, the use of cadavers to analyse non-infectious lesions cannot be replaced, and screening strategies must contain programs to monitor health, not just microbes.

In order to help research establishments monitor the health (including microbiological status) of mice maintained in IVCs, the working group will evaluate,

through literature review, the advantages and disadvantages of the different strategies, the suitability of samples for respective microbes, how sampling should be conducted (e.g. techniques, numbers, frequency and assays), how sentinel welfare and exposure can be improved, and how non-infectious diseases can be monitored. The working group will propose a template to report health monitoring data with information on sample origin, material, techniques and assays. Finally, with the 3Rs at heart, the working group will recommend a methodology to combine health monitoring strategies in order to demonstrate a Specific Pathogen-Free (SPF) status.

Tasks, proposed line of work

The working group shall:

- Review the various samples and detection methods used for health monitoring with focus on mice maintained in IVCs
- Discuss advantages and disadvantages of different samples and detection methods
- Evaluate the different strategies according to the literature with special regard to 3R and validity, respecting the ASSURED criteria where applicable (<https://www.who.int/bulletin/volumes/95/9/16-187468/en/>)
- Recommend practical definitions of epidemiological/microbiological units for mouse IVC and how calculations of number, frequency and type of samples must be adapted to demonstrate an SPF status
- Support the person responsible for the institution's health monitoring program to establish or adapt their existing health monitoring (e.g. with provision of report templates and other documentation)

Composition of the working group

The WG will have 6 members (including convenor), selected based upon their experience of health monitoring programs and methods and nominated by the FELASA member associations. Scientists specialized in LAS, veterinarians, and technicians with documented experience should be considered to this working group.

Budget

A total of 4000 € for telephone conferences and 2-3 face-to-face meetings. Another 3000 € are available for Open Access publication.

Deadline

Two years after start