

Implementation of refined mouse handling

As a support when implementing refined mouse handling, the Swedish 3Rs Center has collected and compiled experiences from Swedish laboratory animal facilities. We hope that these experiences will be helpful and facilitate a transition to refined mouse handling. In this document, we have also included tips from the NC3Rs.¹

Success factors

- **Management support.** Having management support is often described as a prerequisite for a successful implementation of refined mouse handling. A first step may be to identify key persons to contact and involve in the process of changing the work routines. A decision regarding the new handling routines needs to be made. When introducing new work routines, it can be beneficial to have clear guidelines from managers and other responsible personnel to lean on. In order to reduce the pressure on the animal technicians during the transition phase, it is important to clearly communicate that it is okay that the handling may take longer time, and that they will be given time to learn the new techniques.
- **Communication.** To ensure that ongoing experiments are not affected negatively, it may be beneficial to initially offer refined mouse handling as an option, rather than something that is mandatory. In this way, trust can be built, even among possible sceptics. A coordinated and inclusive approach that involves both researchers and animal personnel may contribute to better compliance and create conditions for successful implementation. An inspiring poster on the wall in the animal room may be a reminder of why the change is being implemented and why it is important. The Swedish 3Rs Center has an informative poster that can be downloaded from their website.²
- **One step at a time.** In the event of a major change, it may be easier to take small steps. It is worth to consider whether refined mouse handling can be implemented in one project, one animal room, or in one rack at a time. It may help to implement the approach among the animal technicians first, and wait until the animal technicians feel comfortable and confident with the new work routines before introducing them to the researchers. The animal technicians can

¹ NC3Rs. Mouse handling: Tips for implementation. National Centre for the Replacement, Refinement & Reduction of Animals in Research. <https://www.nc3rs.org.uk/3rs-resources/mouse-handling/mouse-handling-tips-implementation> (2023-05-09)

² The Swedish 3Rs center. Publications. Poster: Don't lift mice by the tail. <https://jordbruksverket.se/languages/english/swedish-board-of-agriculture/animals/the-swedish-3rs-center/publications> (Hämtad 2023-12-19)

then support and help the researchers. In order to visualize the progress of the change, a timeline showing the main steps of the implementation may be helpful. Celebrate when you achieve the milestones. Celebrations contribute to commitment and a sense of participation.

- **Identify and involve ambassadors.** By identifying and involving ambassadors among the researchers and the animal personnel, the change can be accelerated and driven from different parts of the organization.
- **Education and training.** To successfully implement refined mouse handling, it is important to educate researchers and animal personnel. If everyone knows the scientific evidence that underlies the implementation, the transition will be easier. In addition to theoretical education, everyone who handle mice in their work also needs to receive practical education and training. If the resources are not available internally, it may be a good idea to bring in external help to educate the personnel. Remember that it is easier to learn something new, than to relearn. Therefore, it may be easier to start by teaching new employees the refined handling, and then continue with the more experienced personnel. Researchers and animal personnel who have been working for a longer period of time may need more time to learn and adapt to the new methods.
- **Financial planning.** By doing an early review of needs for financial investments, such as the purchase of plastic tunnels, financial obstacles can be anticipated and unnecessary surprises avoided.
- **Let it take time.** A shared experience of many organisations, is that implementation of refined mouse handling needs to take time. Reflect upon what pace of change and which time frame that would be reasonable for your facility.
- **Evaluation.** By evaluating the implementation, it becomes easier to identify problems and obstacles and gain a better understanding of how the transition has been managed. An evaluation can be performed by a questionnaire or by individual conversations with the personnel. The results of the evaluation may be of great benefit both to the internal organization as well as externally to other organizations facing the same transition. By sharing ups and downs along the way, everyone will benefit.

Challenges

- **Concern that refined mouse handling will be more time consuming.** A common misconception is that refined mouse handling takes longer time compared to picking them up by the tail. That is not true. Facilities that have implemented refined handling testify that it takes just as long, or shorter, time for trained personnel to handle the mice with cupped hands or a tunnel.

- **Hygiene and disease control.** If it is not possible to handle the mice with two hands due to hygiene or disease control reasons, they can be picked up using an aid. The aid can be something that is already in the cage, such as a tunnel, a house or similar. You can also use ladders or plastic tunnels that are cleaned and disinfected between different cages or strains of mice.
- **All or nothing.** A common misconception is that all work is in vain if someone picks up the mice by the tail on one or a few occasions. That is not true. The mice will indeed be affected, but mice that are not routinely handled by the tail recover faster from the stress, compared to mice that are regularly picked up by the tail.³
- **Health examinations.** A common argument against refined mouse handling is that it makes health checks more difficult. That is not true. It is possible to examine the health of a mouse that is picked up by hand or by using an aid. A health examination can, for example, be carried out in the hand, in a transparent tunnel or on a grid. Once the mouse has been picked up by hand or by using an aid and is held in the hand, a grasp of the tail can be used to lift the hindquarters and inspect the abdomen and urogenital organs. It has been shown that mice do not perceive this tail grip as aversive, if they have been lifted by hand or tunnel.⁴
- **Mice that have been handled differently at the supplier.** How the mice have been handled at the supplier can affect how they adapt to the refined handling and how the personnel experience the handling of the mice. Mice that have previously been handled by the tail may be more stressed initially, and may need more time to get used to refined handling. Regardless of how the animals have been handled at the supplier, it is possible to habituate the mice to a different handling method during the acclimatization period. It is often possible to quickly get the animals used to less aversive handling. By purchasing mice from a supplier that has implemented refined handling, you can reduce the stress for the mice and save time. Ask your supplier about how they handle the mice.
- **Old patterns and deep-rooted habits.** It can be a big challenge to implement new routines and break old patterns and deep-rooted habits, but it is possible. In order to succeed with the implementation, it is crucial to be transparent and truly understand the difficulties and challenges associated with such a change.

³ Henderson LJ, Dani B, Serrano EMN, Smulders TV, Roughan JV. Benefits of tunnel handling persist after repeated restraint, injection and anaesthesia. *Sci Rep.* 2020 Sep 3;10(1):14562. DOI: 10.1038/s41598-020-71476-y. PMID: 32884048; PMCID: PMC7471957.

⁴ Hurst, J. & West, R. Taming anxiety in laboratory mice. *Nat Methods* 7, 825–826 (2010). <https://doi.org/10.1038/nmeth.1500>

Sveriges 3R-center
551 82 Jönköping
Telefon 0771-223 223
3Rcenter@jordbruksverket.se
www.jordbruksverket.se/3R