The role of rodent colony manager

Laura J. Quinlivan

Laura Quinlivan describes her job as rodent colony manager and gives advice on raising rodents.

In my previous position overseeing rodent breeding projects at Texas A&M University, I often helped investigative staff with problems such as infant mortality and overcrowding. Because so many investigators appreciated the assistance, Texas A&M began to offer colony management services, and I became a full-time rodent colony manager.

I tailor my responsibilities in the rodent colonies to each investigator's needs. Some investigators need a colony to produce a certain number of offspring in a reasonable amount of time. Other investigators might ask me to check vaginal plugs for timed matings, cut tails for DNA extraction, look for phenotypical behaviors or assist in tissue collection. Because of the variability of our services, the colony management program charges investigators for labor and supplies rather than a flat per diem rate.

This arrangement seems to be advantageous for all who participate. Investigators and their staff don't have to be inconvenienced when there is a litter to wean. The IACUC and veterinary staff are happy that an experienced person is tending to daily tasks in the breeding colonies. The animal care staff and their supervisors know whom to approach with breeding-related concerns. And I enjoy taking care of rodent breeding colonies and assisting others in doing the same.

Below are a few practical suggestions for managing mouse breeding colonies.

Creating a breeding setup

It is best to begin breeding mice before they are 3 months old. When breeding for the purpose of maintaining stock animals, I replace old breeders every 3 months and keep the established median-aged breeders. Females

are generally retired from breeding by age 9–12 months. Males may be able to breed from age 5–8 weeks throughout the rest of their lives, though their fertility usually diminishes after 12 months.

When setting up a new breeding pair, it is best to leave the male alone in the cage for a few days before introducing the female. If either partner is overly aggressive, it may help to separate the mice during the day.

Occasionally, breeding performance can begin to taper off in a monogamous setup. In this case, if either of the mice is approaching 12 months of age, I may consider replacing them with new breeders. Otherwise, I might separate the pair for a short period of time or offer some enrichment to help renew their interest in each other.

To prevent overcrowding, my facility weans litters born to monogamous pairs after 19–20 days if the female looks pregnant. If the dam is not pregnant, or if the male has been removed from the cage, the offspring may remain with her for no longer than 28 days as male pups may impregnate the dam or their siblings.

Some dams have lower infant mortality when the male is present to help with rearing, whereas others may do better when he is absent.

If a dam is not lactating, or if she belongs to a strain that is known to have high infant mortality, I might use a foster female. The foster female is usually a different color from the pups being fostered, so that the offspring can be combined then separated later. The foster female should be of a docile strain with high milk production, so that she will be more likely to accept the new pups.

Conditions that may affect breeding

Vibration and noise can cause rodents to stop breeding, to have infrequent or small litters or to neglect or cannibalize their offspring. Rodents should be subjected to as little offensive noise as possible.

It is important to know when to handle dams and offspring. The time of delivery is stressful for the dam, and unnecessary handling immediately before or during delivery may result in difficulty giving birth. Handling the offspring within 24–48 hours after birth may cause the dam to neglect or cannibalize the pups. Caretakers should be notified not to change cages during these times.

Male rodents have a delicate olfactory sense, and strong smells can harm their fecundity. Staff should avoid using perfumes or cleaning agents with strong odors.

Record-keeping

Accurate, detailed and up-to-date records are essential to keeping track of the animals in a colony and to identifying good breeders. Records can also help to predict offspring's genetic characteristics, and tracking mortalities can help to identify whether or not knockouts are lethal.

Networking and resources

To get to know others in the field, I recommend going to conferences, attending seminars and subscribing to services such as AALAS's TechLink. You might come across someone who carries out a procedure slightly differently but more efficiently. It is also important to become familiar with the Guide for the Care and Use of Laboratory Animals, as well as the policies of your IACUC and animal welfare laws.

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