**Mouse Breeding Management**

*This information is adapted from the Mouse Breeding Colony Management course provided by the AALAS Learning Library. For more detailed information, see* [*www.aalaslearninglibrary.org*](http://www.aalaslearninglibrary.org)*.*

**Three R’s of planning for colony breeding:**

1. Reduce the number of animals used to reduce production.
2. Refine experiments to minimize pain, distress, and unnecessary production.
3. Replace animal use with computer models or in vitro research.

**Breeding System for McLaughlin Lab Mice:**

1. Non-intensive System
	1. Stud males are individually housed.
	2. Females are placed with males only for breeding, and are separated before they deliver.
		1. NOTE: We keep mating pairs together for 5 days (a sexual cycle duration) to ensure a mating event has taken place. However, do not keep pairs together longer than 5 days, as this may deter female receptiveness to mate with an already familiar male (and vice versa).
2. Timed Mating System
	1. Used when the exact date of gestation must be known for embryonic dissections or for early post-natal harvests.
	2. Females are placed with males overnight. The next day, check for a plug (white-yellowish) in the vagina of the female. This means copulation has occurred.
* Pregnancy is generally observable at 10 days gestation and by 12 days it should be quite obvious. If the female is carrying a small litter (1-3 pups) pregnancy may not be obvious until later in the gestation period.
* If a female housed with a male does not look pregnant after 12 days, then check again in a week. Continue checking each week.

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| **Reproductive Data of Mice**

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| Life span (y) | 1–3 |
| Puberty age | male 5–7 wkfemale 4–5 wk |
| Optimum reproductive age span | male 2–10 mofemale 2–10 mo |
| Sexual cycle type | Polyestrous |
| Sexual cycle duration | 4–5 d |
| Estrus duration | 12–14 h |
| Postpartum estrus | Fertile |
| Gestation period | 19–21 d |
| Litter size/# of young | 4–12 |
| Age at weaning | 21–28 d |

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**Selecting Breeders**

* The animals selected should have the following characteristics.
	+ The mice should look healthy.
	+ The mice should be of good size for breeding.
	+ The mice should look well groomed.
* If possible, it is better to choose animals from medium size litters of five to seven pups over those from large litters because mothers produce the same amount of milk no matter what the litter size.
* Mothers that are consistent breeders are the best choice. Animals that have been barbered, bitten, or that are runted are poor choices for breeding.
* Males and females should be of approximately the same size. A large male with a tiny female will not be a productive breeding pair.
* When selecting breeders, mate healthy mice that are between 4 to 6 weeks old for best production.
* Try to select animals that are most separated in lineage (ie are not immediate family members). For example, do not pair siblings, mother-son, or father-daughter.

**Weaning**

* Mouse litters are separated from mom at post-natal day 21.
	+ CHIP KO mice are much smaller than their wildtype and het littermates, and typically cannot reach food or water in the cage. We leave the KO’s with the mom until post-natal day 30.
* Males and females should be separated at weaning.
	+ Five animals per cage maximum.
	+ Males from the same litter can be kept together; however, do not reintroduce males after they have been mated with a female.