Breeding Troubleshooting Questionnaire
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- What have the room environmental conditions been in this room during the times of deaths or breeding problems? Think hi/lo temperature & humidity, large fluctuations, light timers.

- Supplement enrichment, e.g. igloos, Shepherd Shacks extra Nestlets, EnviroDri, chewing sticks, treats, etc.? Keep in mind that in some strains enrichment may lead to intra cage competition and fighting.

- Vibration problems? Consider anti vibration pads. Ideal pad material is able to match the vibration source frequency & wavelength.

- Location of cage in reference to the rack blower, computers, computer/TV monitors, animal transfer station, etc. The closer to those items, the greater the sound and vibration.

- Volume of speaking, noisy keychains or loud equipment where animals are present. The louder the volume (vs. whispering & quiet equipment) the greater the effect.

- Are you moving animal cages from room to room using light or plastic carts? The plastic/lighter carts vibrate more. Consider pneumatic wheels to absorb transportation vibration.

- Lubrication: Be sure all doors and cart wheels are lubricated to minimize noise.

- Energy dense supplementation may help improve pup yield:
  - Bacon Softies (www.bio-Serv.com).
  - DietGel Boost (http://clearh2o.com/research-products/dietgel/dietgel-boost-2.html): High calorie supplement to quickly move pups forward.
  - Mix 50:50 with powder rodent chow and moisten with water for weak pups or mothers in needs of extra energy.

- What is the fat and protein % of the diet they are on? e.g., BALB/c mice tend to need higher fat than other strains for breeding. Consider a higher fat diet. In some cases, may need to actually decrease fat content. This is frequently done in males with diminished breeding performance from being overweight.

- What breeding scheme are they using (timed? monogamous, trio, harem?). Some strains do better with a particular scheme or the other. Some do better if another adult is in the cage. Some don’t. Know your strain.

- Are males taken to the female cage or vice versa? Usually the female should be taken to the male’s cage.

- Are cages being left undisturbed 2-3 days before parturition and at least 3-5 days post-partum? This time may be longer for certain strains and may be crucial to prevent cannibalism and neglect by mother.

- Cannibalism?
  - If so, who is doing the cannibalism? Mom? Surrogate? Another cage mate?
First-time mothers or experienced mothers? Often first-time mothers cannibalize but will not subsequent litters.

If cannibalism is occurring, decreasing the dark cycle (which is when the mice are most active) by 2 hours may decrease cannibalism, e.g. 14 hr light/10 hr dark may help.

Are males kept in the cage during peri-partum period? They may be the guilty party, however with some strains males may actually help raise the young.

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Is there another female in the cage to help raise pups during this time? May help in some strains.

Are personnel coming into the room during the dark cycle?

Any noise or excessive traffic in the room or hallway?

Anybody coming into the room that wears perfume?

Extra enrichment may help minimize cannibalism.

Love Mash™ Rodent Reproductive Diet, Bio-Serv given to pregnant rodents have been shown to prevent cannibalism of litters in some dams.

How old are the males? How old are the moms? Older animals lose reproductive yield. Generally (although this is strain dependent), most strains productivity sharply decline after 9 months of age.

Is this a shared room or is it assigned to one PI only?

Who all go into the room? Are practices consistent (thus importance of good SOPs)? Too many people going into the room? Are the same people going in the room?

What’s the background of these mice? Have you looked up breeding issues related to this background?

Age/weight at weaning. Using the 10-gram weight could help in deciding when to wean.

Is there an overcrowding issue? e.g., multiple litters or generations? If so, older pups may be trampling on younger pups. Mom may not be able to sustain both litters.

Health issues that may affect reproduction?

Any experimental manipulations during breeding, gestation or immediately postpartum being done?

Location of breeding cages within the room: If close to the door, consider moving to the back of the room. If on top rows of rack, consider moving them to the bottom rows.

Light too intense in the room? Does light need to be attenuated or cages need to be placed on lower shelves of the rack?

Type of light: Fluorescent lighting produces ultrasonic noise that should be shielded with a solid cover (not open mesh).

Electronic timers/temp/humidity sensors: Should be kept at least 1 meter away from animals or shielded.

If the room has audiogenic motion sensors, replace with passive infrared motion detectors.