

Optimizing Recognition of Pregnant Mice in Research Settings

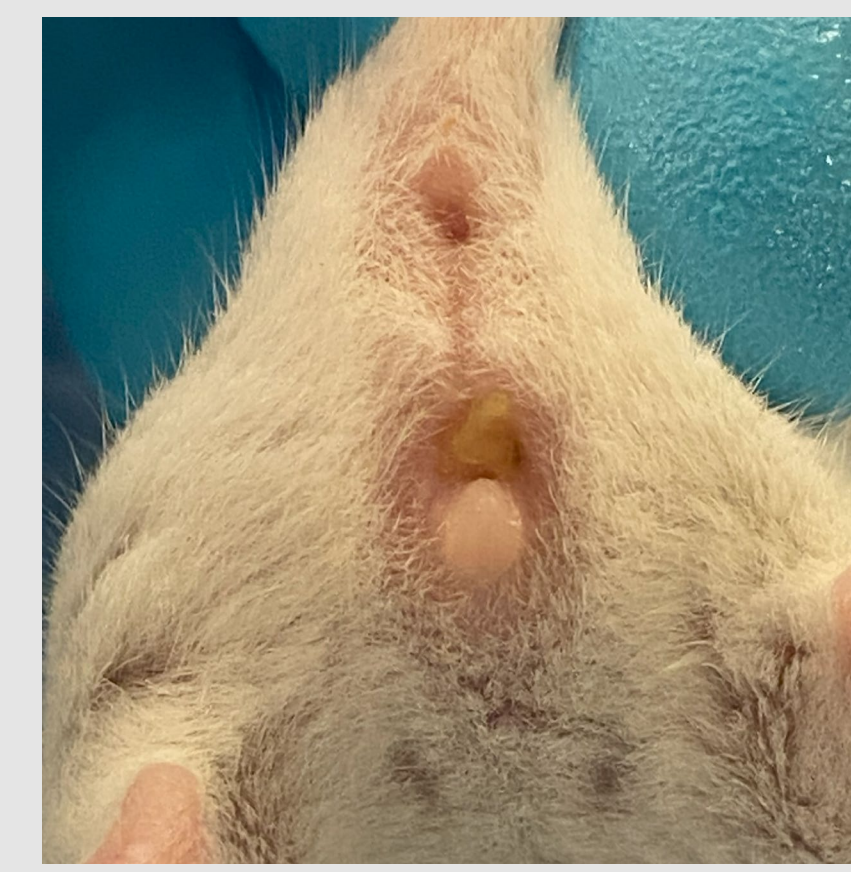
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Abstract

Pregnant mice are often difficult to recognize yet are widely used in biomedical research, particularly in studies involving genetics, reproduction, and fetal development. Failure to identify pregnancy can lead to inadequate housing conditions and overlooked pregnancy-related complications, negatively impacting maternal and fetal health and increasing variability in research outcomes. Ensuring optimal care for pregnant mice is essential for both ethical considerations and data integrity. This poster is designed to aid in recognizing signs of pregnancy in mice using visual references.



**Illustration A
Vaginal Plug.**

Can be considered day 0.5-1.5. For this posters purpose, we called it day #1 the morning plug was noted.

Approach

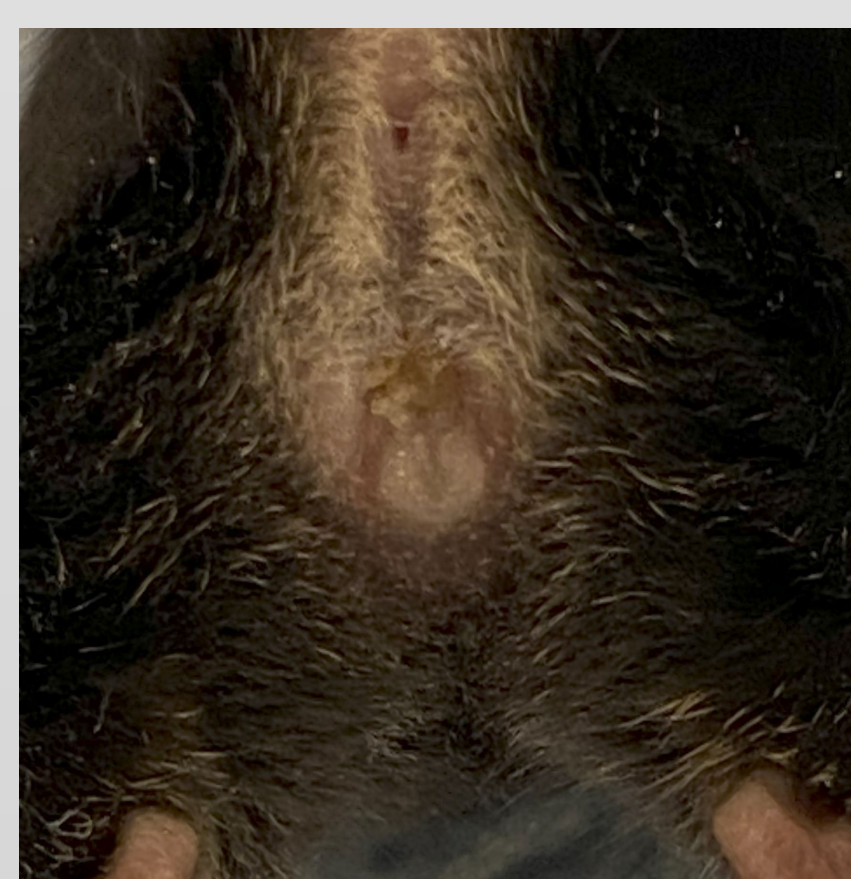
This poster provides a comprehensive guide to recognizing pregnancy in mice through a series of high-resolution images showing photographic evidence of external and internal changes in C57BL/6 and BALB/c mice.

Observations

Behavioral Changes: Pregnant mice may display nesting behavior, increased rest, and reduced activity, particularly during late gestation.

Fur Condition: Subtle changes in fur texture or increased grooming may be observed in some pregnant mice. (Noted in mouse 3B day 12 and 16.)

A much less time consuming method and safer than palpation, is to place the mouse over the finger and look for fetal bulge. Pressure under the abdomen will protrude the developing fetus for visual view. We can typically see this as early as gestation day 8 – 12

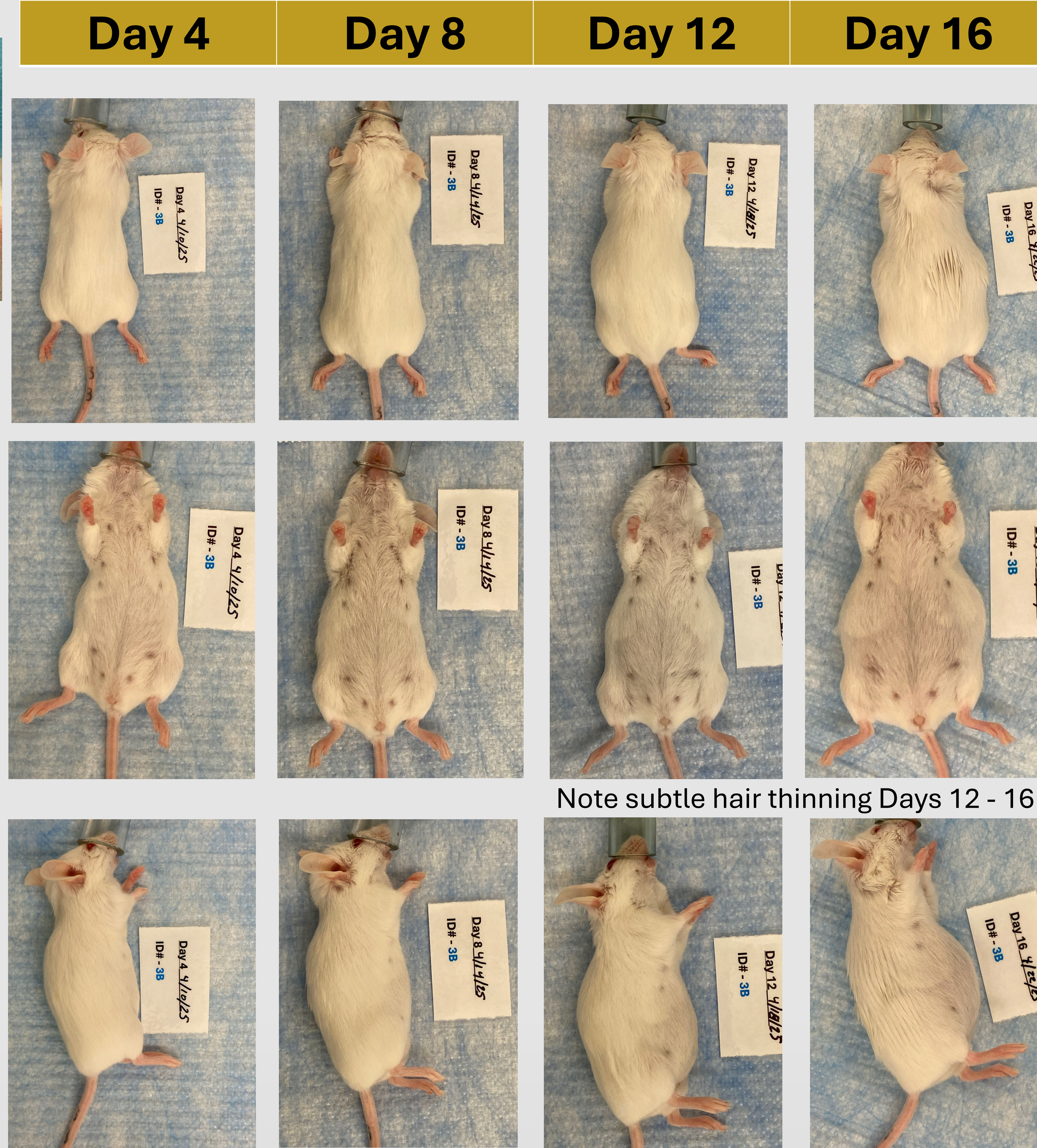


**Illustration B, left
Vaginal Plug
C57BL/6
mouse 1A**



Poster Download

Illustration - the technique of placing the female over a finger to look for the "bulge" (arrows) of fetal development at days 8, 12, and 16 (left to right).

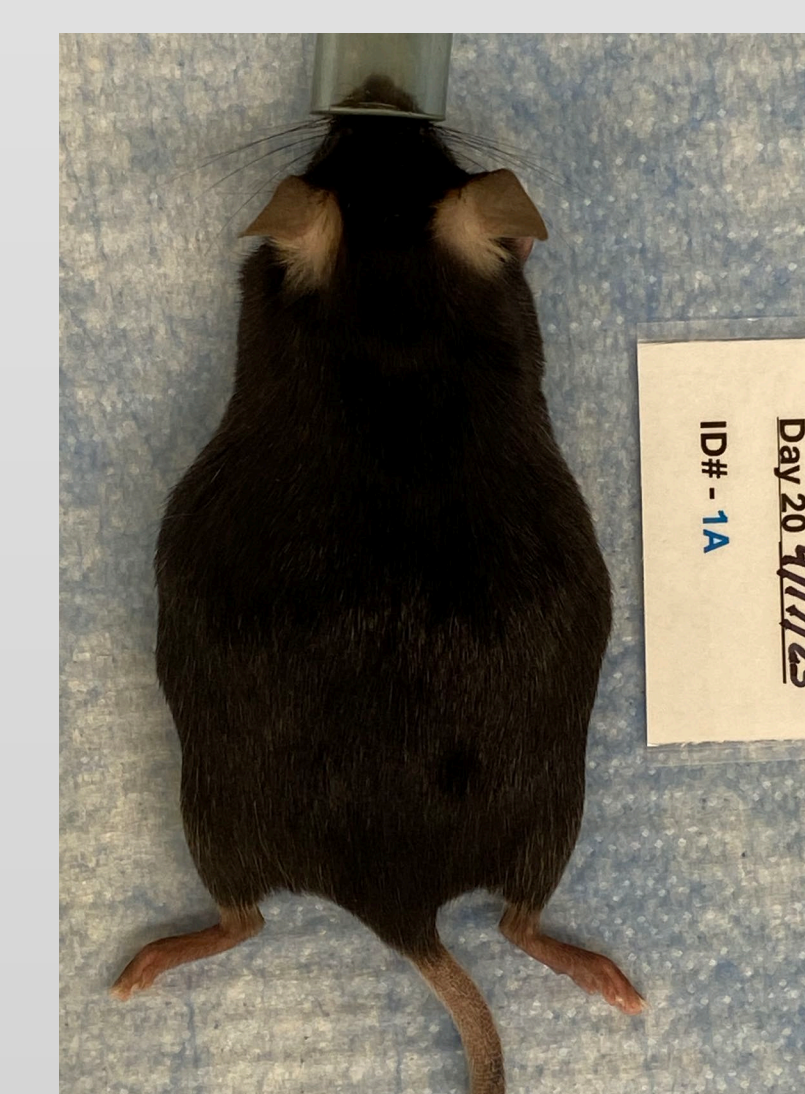


Note subtle hair thinning Days 12 - 16

Physical Appearance of Pregnant Mice by Gestation Stage

- **Vaginal plug (illustration A and B)** is a temporary, waxy, whitish mass that forms in the vaginal opening of a female mouse after successful mating. Visible for up to 24 hours post mating, but can dislodge much sooner. Not always visible, therefore visual observations of the mouse should be used to determine pregnancy.
- **Early Gestation (Days 0–7):** Minimal visible changes. The mouse appears similar to a non-pregnant female.
- **Mid-Gestation (Days 8–12):** Slight rounding of the lower abdomen, a more pear-shaped profile, and subtle nipple visibility.
- **Late Gestation (Days 13–16):** Significant abdominal swelling, a clear pear-shaped body, and visible nesting behavior. Fur may appear slightly stretched.
- **Final Stages (Days 17–20):** Maximum abdominal distension, visible fetal movements, and pronounced nesting behavior. Nipples may become more visible.

Day 20



Weight Gain: While weight gain is a common pregnancy indicator, individual variations exist due to genetics and health. Regular monitoring can be an indicator of pregnancy; most notable around gestation day 12.

3B (BALB/c) Weight Gain Analysis:

- Day 1 to Day 4: +0.98g
- Day 4 to Day 8: +1.49g
- Day 8 to Day 12: +3.26g
- Day 12 to Day 16: +3.15g

1A (C57BL/6) Weight Gain Analysis:

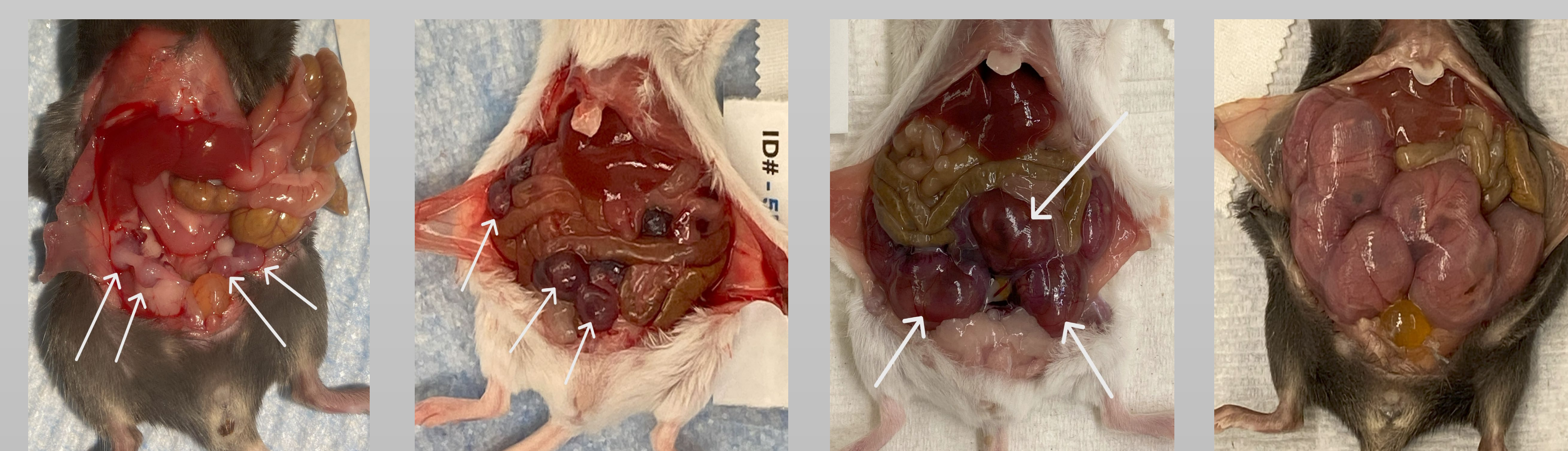
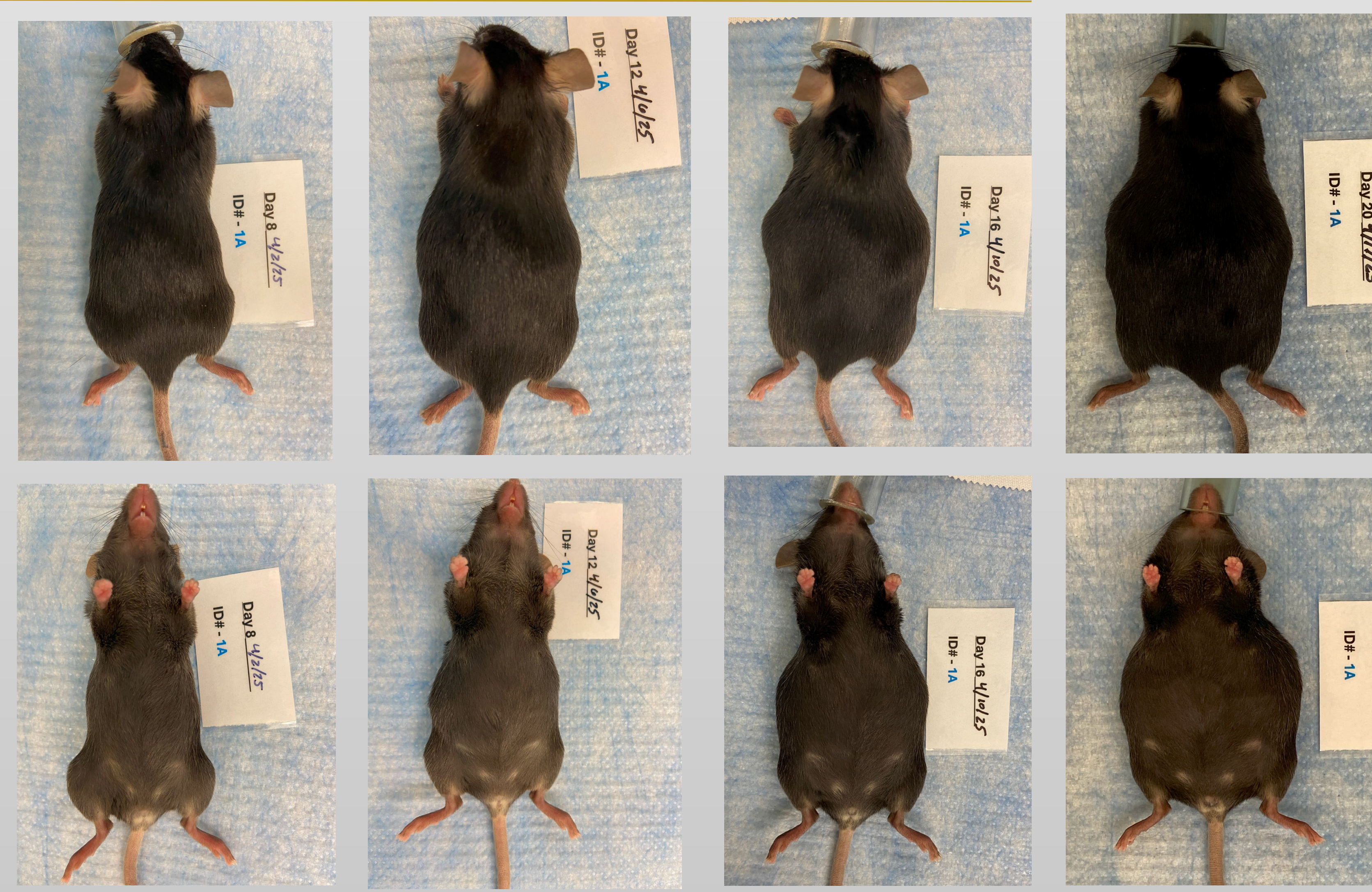
- Day 8 to Day 12: +4.66g
- Day 12 to Day 16: +6.03g
- Day 16 to Day 20: +2.15g

Conclusion

Direct comparison with non-pregnant mice and regular training and practice improve proficiency of pregnancy detection. Visual cues help new staff and researchers recognize early pregnancy signs and estimate gestation age, ultimately contributing to more humane housing conditions and improved pup survival.

References

Pang, S. C., Janzen-Pang, J., Tse, M. Y., Croy, B. A., & Lima, P. D. A. (2013). *The cycling and pregnant mouse: Gross anatomy*. In *The Guide to Investigation of Mouse Pregnancy* (pp. 1–10). <https://doi.org/10.1016/B978-0-12-394445-0.00001-1>



White arrows below point to fetal development. Visualization helps to understand the abdominal appearance of pregnant mice.