Webinar Q&A Report:
Integrating Metabolic Phenotyping with Behavioral Neuroscience

1. **Can the Promethion system be used for studies in rats?**

   Sable: Yes, there is a larger rat metabolic cage that has the same types of modules as shown in the mouse cages. Please see our website: https://www.sablesys.com/products/promethion-line/promethion-high-definition-multiplexed-respirometry-system-for-rats/

2. **Can you point me to software that can run the Markov chain analysis?**

   Sable: Our data analysis software, ExpeData, can optionally export .dot format files during EthoScan (behavior) analysis. These files can be imported into visualization software to obtain a graphic representation of Markov chains. I have used GraphViz successfully for this purpose (http://www.graphviz.org/). An online visualizer is also available: http://rise4fun.com/agl.

3. **Can you restrict food during certain times with this system?**

   Sable: Yes, access times to food can be controlled within the software using the AC-2 Access Control Module.

4. **What is the maximum flow rate of the system?**

   Sable: The maximum flow rate of the system is 4L/min.

5. **Is there any detriment to the experiment if one of the cages is compromised/broken?**

   Sable: The Promethion system has many built in safety guards to protect experiments and data quality. Before starting an experiment, specific alarms can be set so that the researcher can be notified via email or text should a cage be compromised unexpectedly.

6. **Compared to other mouse cage systems, Sable Systems only has one measurement unit instead of multiple, does that mean none of the cages would be usable if Promethion broke?**

   Sable: In a multiplex system one set of pumps and analyzers controls 8 metabolic cages. If a pump or analyzer fails, then the analysis of the 8 cages is compromised. Sable also offers continuous systems where each metabolic cage has its own pumps and analyzers.

7. **Is it possible to house several animals in a behavior-measuring Promethion and use some type of RFID readers to detect activity from the different animals?**

   Sable: Yes. A larger cage is required for group-housed animals, but with a few modifications, this cage would allow for food and water intake detection for each animal using RFID readers.

8. **Do you need to use the behavior analysis system in conjunction with metabolic measurement?**

   John: No. Metabolic data can be analyzed without using any behavioral data if the researcher chooses to do so. The behavioral data is always available in the raw data file if the researcher wishes to incorporate behavioral analysis at a later time.

9. **Can you export data from the system for use with other behavioral analysis programs?**

   John: Yes. The data can be exported from the system as Excel or CSV file formats.

10. **Is there any limit to the number of cages that you can use with a single system?**

    John: The Promethion system is easily expandable making the number of cages for a system nearly limitless.

11. **Can you do operant conditioning studies with the Promethion system?**

    John: Yes. Some of the cage accessories that can be used for operant conditioning include the wheel, access control door, and the wheel stop. In-cage voluntary wheel running can be linked to food access for operant conditioning studies. We are also developing an in-cage operant wall.

12. **Can you report EE per unit body mass?**

    John: Recording of body mass allows expression of EE on a mass-specific basis, using the most current animal masses. This is optional. Simple division of EE by body mass, incidentally, is falling out of favor. Many strategies exist for "correcting" EE to take body mass into account, and Promethion data are compatible with all of these, including sophisticated variants such as analysis of covariance (ANCOVA).

13. Can you detect the acute contribution of VWR to EE like you showed for OWA?

Dan: Yes, we can. The effect of VWR is more robust and currently we are working on ways to distinguish between OWA and VWR, which often occur simultaneously during VWR.

14. Does the change in EE correlate with the amount of VWR performed?

Dan: Yes, it does. This was an important validation of these data.

15. Would you expect the predicted ~45% mitigation of negative energy balance translates directly to 45% less weight lost?

Dan: Probably not, because increasing food intake can also be used to mitigate negative energy balance.

16. Does food intake change in animals given access to a running wheel?

Dan: Food intake does increase over longer periods of time (> 2 weeks) and would be an additional factor to consider for longer-term studies.

If you have additional questions for Sable Systems International regarding content from their webinar or wish to receive additional information about their products and laboratory services, please contact them by phone or email:

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