

May 10, 2019

U Mass - Energy balance – food intake, energy expenditure, physical activity

DOI

<https://dx.doi.org/10.17504/protocols.io.xwwfpfe>

Jason Kim¹

¹University of Massachusetts

Mouse Metabolic Phenotyping Centers
Tech. support email: info@mmpc.org



Lili Liang



Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.xwwfpfe>

External link: <https://mmpc.org/shared/document.aspx?id=149&docType=Protocol>

Protocol Citation: Jason Kim 2019. U Mass - Energy balance – food intake, energy expenditure, physical activity. **protocols.io**
<https://dx.doi.org/10.17504/protocols.io.xwwfpfe>

License: This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working

Created: February 08, 2019

Last Modified: May 10, 2019

Protocol Integer ID: 20150

Keywords: food intake, energy expenditure, physical activity, metabolic cage measurement, indirect calorimetry measurement, labmaster metabolic cage system, using metabolic chamber, indirect calorimetry, vco² production rates in individual mice, metabolic chamber, housed awake mice, vo² consumption, acclimation of mice, home cages during the study, energy balance, respiratory exchange ratio, physical activity summary, awake mice, cage study, energy, individual mice

Abstract

Summary:

The TSE PhenoMaster/LabMaster Metabolic Cage system is used to measure indirect calorimetry, food/water intake, energy expenditure, and physical activity in individually housed awake mice. The experiment noninvasively measures VO₂ consumption and VCO₂ production rates in individual mice using metabolic chambers and calculates the respiratory exchange ratio (respiratory quotient) to reflect energy expenditure. Metabolic cage measurement is conducted continuously for 72 hours (3 days) to account for acclimation of mice housed in home cages during the study. With our high-speed Siemens O₂/CO₂ sensing unit, indirect calorimetry measurements may be performed at a 20-min interval for a full 12-cage study.

Materials

MATERIALS

 TSE Phenomaster Metabolic Cages [TSE Catalog](#) #TSE Phenomaster Metabolic Cages

 LabMaster Software [TSE Catalog](#) #LabMaster Software

 Mouse diets

 Drinking water

 Corn-cob bedding

- 1 Metabolic cage food and water baskets are calibrated.
- 2 Drink and food baskets are filled with water and appropriate diet.
- 3 Corncob bedding is added to the cages.
- 4 Mice are individually housed in metabolic cages and checked daily for access to food and water.
- 5 Software is set to collect data at selected interval for 3 consecutive days (72 hour measurement period).
- 6 Post-run data are exported and analyzed using Microsoft Excel program.
- 7 Mice should be assessed for body composition (whole body lean mass) prior to metabolic cage measurement in order to incorporate whole body lean mass data for energy expenditure calculation.
- 8 Metabolic cages require monitoring on a daily basis to ensure food and water are accessible to the mice.