Data in Brief 7 (2016) 472–475

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Data on oxygen consumption rate, respiratory exchange ratio, and movement in C57BL/6J female mice on the third day of consuming a high-fat diet

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ARTICLE INFO

Article history:
Received 14 November 2015
Received in revised form
25 February 2016
Accepted 26 February 2016
Available online 3 March 2016

Keywords:
Respiratory exchange ratio
VO2
Oxygen consumption
Physical
Activity
Mice
Fasting
High fat diet

ABSTRACT

Whole animal physiological measures were assessed following three days of either standard diet or high fat diet, in either the fasted or non-fasted states. Our data shows that acute 3-day high fat feeding increases whole body lipid oxidation. When this feeding protocol is followed by an overnight fast, oxygen consumption (VO_2) in the light phase is reduced in both dietary groups, but oxygen consumption in the dark phase is only reduced in mice fed the high-fat diet. Furthermore, the fasting-induced rise in dark cycle activity level observed in mice maintained on a standard diet is abolished when mice are fed a high-fat diet.

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Specifications Table

Subject area	*Biology*
More specific subject area	*Animal Physiology*
Type of data	*Graph*

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http://dx.doi.org/10.1016/j.dib.2016.02.066
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How data was acquired	*Comprehensive Laboratory Animal Monitoring System (CLAMS)*
Data format	*Means ± S.E. from CLAMS data*
Experimental factors	*C57BL/6J female mice fed standard chow or high fat diet (45 kcal% fat) for three days. Animals were assessed by CLAMS in either the fasted or non-fasted state.*
Experimental features	*Oxygen consumption (VO_2), respiratory exchange ratio (RER), Physical Activity*
Data source location	*University of Waterloo, Waterloo, Ontario, Canada*
Data accessibility	*Data is provided within the article*

Value of the data

- These data are valuable to researchers interested in investigating the metabolic response to fasting
- These data are valuable to researchers interested in the physiology of acute high fat feeding
- These data are valuable to researchers studying female mice
- These data are valuable to researchers benchmarking physiological changes during different feeding conditions

1. Data

Fasting during the light phase reduced oxygen consumption in female mice fed either a high-fat or standard diet (SD) for 3 days (Fig. 1B), but during the dark phase, fasting only reduced oxygen consumption when mice were fed a background high-fat diet (Fig. 1A). In both the dark and light phases, fasted mice fed a high-fat diet (HFD) had reduced oxygen consumption when compared to fasted mice fed SD (Fig. 1). Fasting significantly reduced the respiratory exchange ratio (RER) in mice fed either background diet, and consuming a HFD resulted in a lower non-fasted RER than consuming a SD, regardless of the phase of study (Fig. 2). Fasted mice fed a SD had increased activity during the dark cycle compared to non-fasted mice, although these data do not show a similar increase in activity during the dark cycle with fasting when mice are given a background HFD (Fig. 3A). During the light cycle, these data show no significant differences between dietary or fasting/non-fasting groups with regards to activity (Fig. 3B).

2. Experimental design, materials and methods

2.1. CLAMS

All animal procedures were approved by the University of Waterloo Animal Care Committee and were in accordance with the guidelines of the Canadian Council on Animal Care. Group-housed mice were maintained on a reverse light-dark cycle and fed a defined standard diet (SD) (Cat D12450H

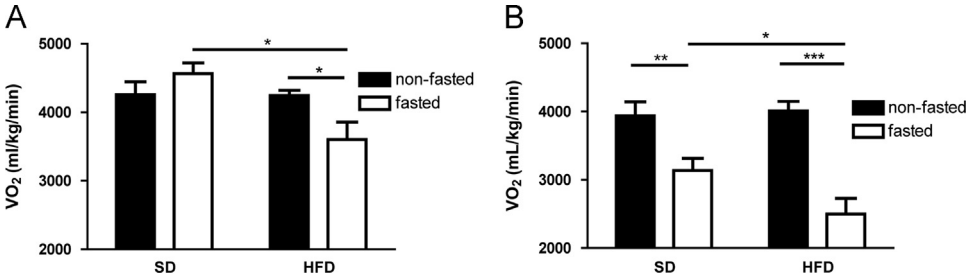

Fig. 1. Data on oxygen consumption in fasted and non-fasted mice at day three of feeding a standard (SD) or high fat diet (HFD). (A) VO_2 during the dark phase. (B) VO_2 during the light phase. Data are means ± S.E.M. ($n = 7-9$). ($^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$).

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