Form and Function

Body weight regulation in small rodents a matter between predation risk and starvation?

Rita I. Monarca[1], Maria L. Mathias[1], John R. Speakman[2]

[1]CESAM - Universidade de Lisboa, Lisboa, Portugal, rimonarca@fc.ul.pt
[2]University of Aberdeen, Aberdeen, UK

Genetic and environmental factors have been linked on several models that, in the recent years, have discussed the evolutionary background of body weight regulation. Small wild mammals are known to have a strong body weight regulation system. The risk of predation is among the factors suggested to explain the non-prevalence of overweight animals within natural populations, as the ability to escape predators, can be highly compromised if the animals are carrying large fat reserves. Such risk needs to be balanced with the risk of starvation due to the absence of fat stores, when food resources are scarce. We experimentally investigated the predications of the predation-starvation model using wood mice (*Apodemus sylvaticus*) and C57BL/6 mice by manipulating the risks of starvation and predation. We analysed the physiological and behavioural responses by simulating stochastic starvation events and manipulating the predation risk through broadcasting of owl calls. Results showed reductions in body weight, and body weight gain, induced by the increased risk of predation. Such variations were mostly explained by reduction of food intake, and increase in energy expenditure through alteration of physical activity and behaviour. Resting metabolic rate and thermogenic capacity were not affected. Starvation periods were compensated by overfeeding and reduction in activity during the recovery period, however fat storages did not increase over the limits of the pre-starvation period. These observations showed the influence of environmental components setting the body weight regulation limits and support the hypothesis of the predation risk being a factor modulating small rodents body weight.

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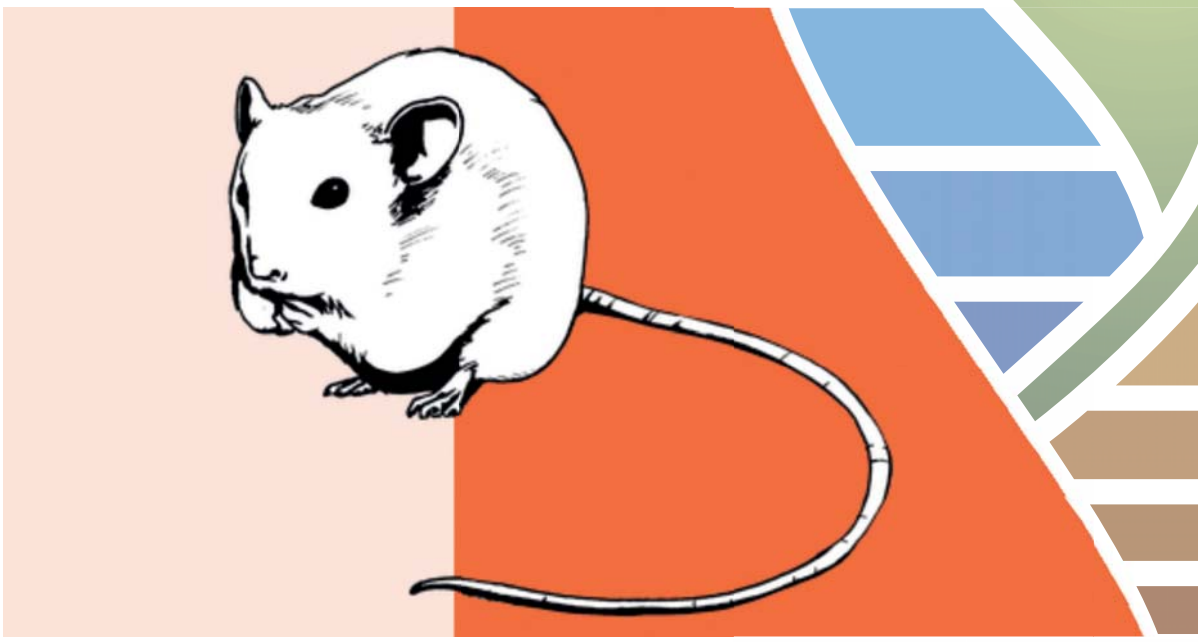

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Editors:
Jens Jacob[1] and Jana Eccard[2]
[1]Julius Kuehn Institute, Federal Research Centre for Cultivated Plants,
Institute for Plant Protection in Horticulture and Forests, Vertebrate Research,
Toppheideweg 88, 48161 Münster, Germany
[2]University of Potsdam, Institute of Biochemistry and Biology,
Animal Ecology Group, Maulbeerallee 1,
14469 Potsdam, Germany

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