

To wheel or not to wheel

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Introduction

Our study into the implementation of running wheels in overweight prone strains of mice and the potential integration of this practice into our mouse protocols.

Aims and objectives

- To monitor the health and welfare of our overweight laboratory mice.
- Induce and enhance animal enrichment whilst reducing obesity.
- Document the weight, food and water consumption of all mice involved (both in the cages with wheels and in the control cages without the wheels).
- Implement the 3Rs by determining that the use of wheels is beneficial to the mice.

Hypothesis

H1 cages with the implementation of running wheels will have significant weight difference in comparison to the control cages.

Null cages with the implementation of running wheels will not have a significant weight difference in comparison to the control cages (Figure 1).

Methodology

The cages were given aspen, sizzle nest, tunnel, transbreed diet and wheel in 4 out of 8 cages.

Mice were taken at weaning age of 21 days old and using a randomised approach to wheel and no wheel, determined which cages were given a wheel or not to avoid bias.

Once half of the cages were allocated a wheel, the rest were placed as control.

Every week each mouse was weighed and the following components were weighed:

- water
- food left
- food replaced

The condition of each nest was recorded to help give an idea on stress levels within each cage.

Each base was cleaned weekly. This study trialled for 16 weeks with a total of 30 mice.



Figure 1.

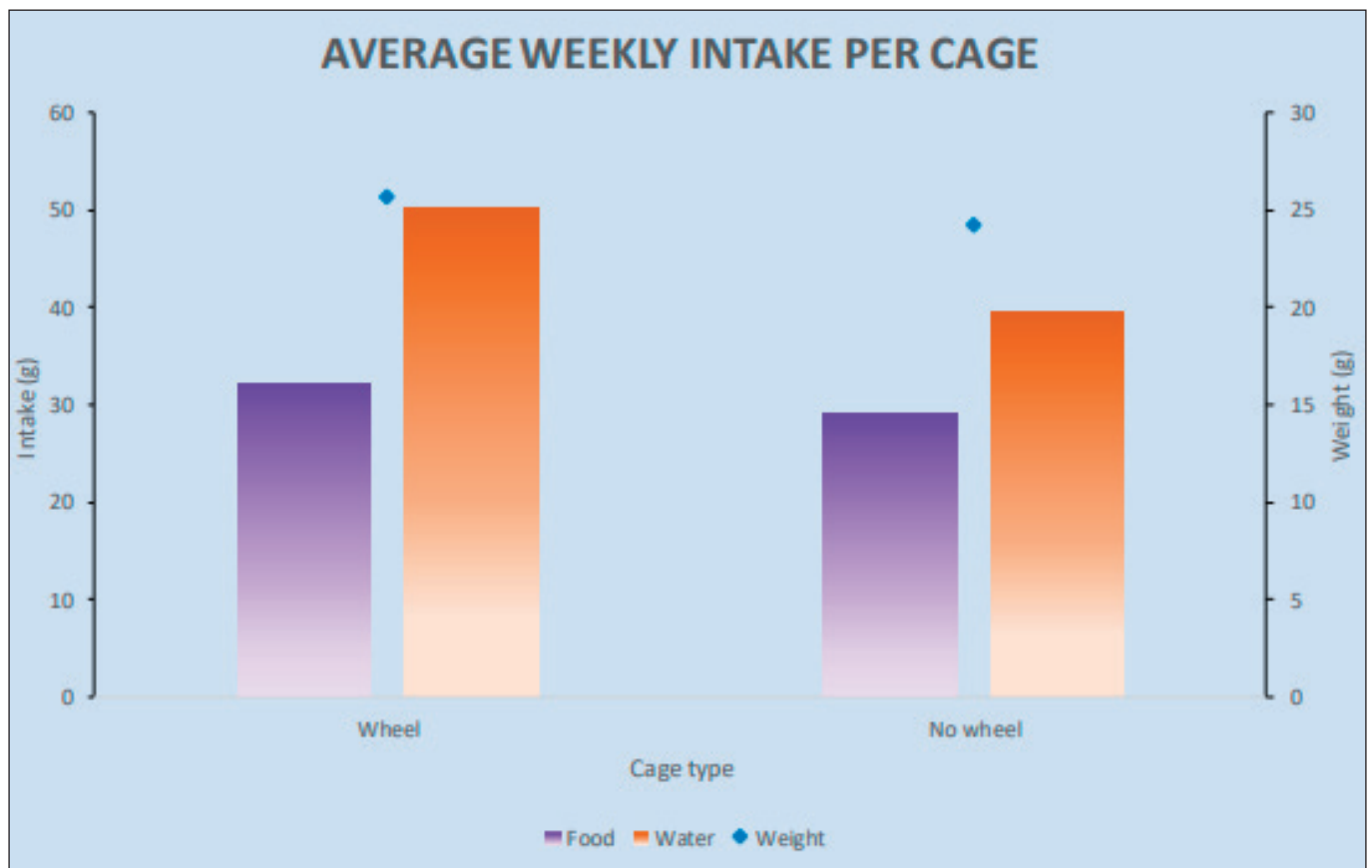


Figure 2.

Results

From the data, we found that on average the cages with wheels had a weight gain of only 1.5g (Figure 2). The cages with wheels drank on average an extra 10.6g of water per week and ate 3g more of diet.

Although the mice in the cages with wheels gained weight, the nests were found to be neater and more consistent in the cage. This could be an indicator of less stress due to increased enrichment in the cage.

Throughout the study we only had 2 cages that developed stereotypical behaviour. One cage did not have a wheel and one cage did. The cage without a wheel started showing this behaviour from week 14 and the cage with a wheel from week 15.

Conclusion

From this study although it did not meet the hypothesis set out at the start, the final results showed that providing a wheel in the cages decreased stereotypical behaviour and increased metabolic needs e.g. food and water intake.