

Controlling Humidity - Improved Breeding and Validity of Research

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Background and ai

Regulatory guidelines for relative humidity (RH) when housing laboratory rodents are $55 \pm 10\%$. These were set based on quite limited data and little is known on how fluctuations in RH affects laboratory rodents, or how high versus low RH, within these boundaries affects them. Studies through time have shown that RH has an impact on rodent health.

How relative humidity affects laboratory rodents is summarized below and in figure 1.

- Puberty is delayed in female mice housed under 15-30% RH, whereas first estrus was attained earlier when housed under a RH of 75% (1)
- At 35% RH compared to 75% rats consume 5% more food (2)
- Low RH has shown to increase activity in mice (2)
- RH impacts growth conditions for bacteria and fungus and transmission of virus (3-6)

We aim to investigate the effect of tighter control of RH on health and physiology of research animals, e.g. by investigating the effect on breeding performance. Additionally, the potential of uncontrolled RH to affect outcomes of studies, and thus validity of research, are part of our studies as well. We specifically look at RH controlled accurately at 55% or above.

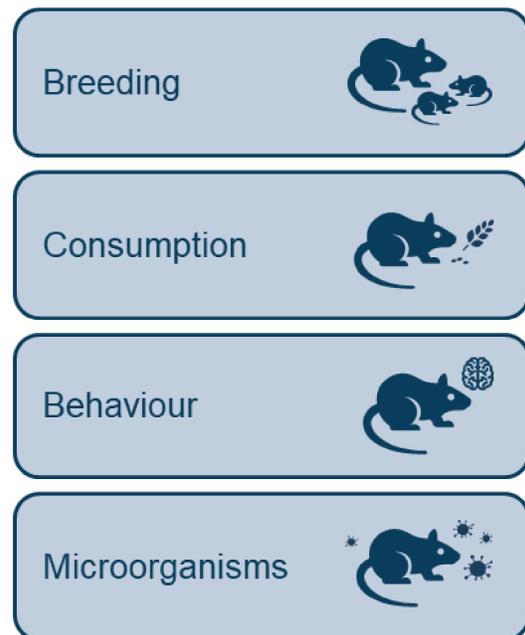
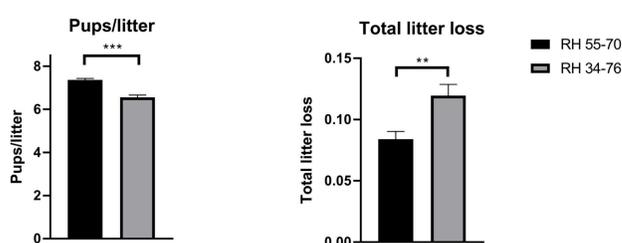
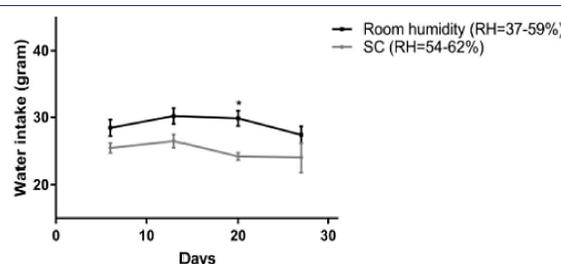


Figure 1. Relative humidity have found to have effects on breeding, consumption, behaviour and microorganisms (1-6).

Results from studies with control of RH above 55%

Completes studies:

- Significantly lower water intake. Find a detailed description [here](#).
- Significantly higher number of pups per birth and lower number of total litters lost. Find a detailed description [here](#).



Preliminary findings:

- Less male aggressive behaviour
- An indication of higher success rate of embryo transfer

Conclusion

The literature and the results we have found support that RH affects study results, animal physiology and our results show that tighter control of RH can improve murine breeding performance significantly. Further investigation is warranted on how different levels of stable RH versus variation in humidity affect the breeding performance.

Studies are performed ongoing to further investigate the effect of RH on breeding performance, embryo transfer success rate, aggression of male mice, skin health etc. The anecdotal feedback from existing installations is investigated further to accept or reject hypotheses of effects of RH on animals and research results.

References

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