

# Comparison of nesting materials to determine the best visibility of mice in

## Individually Ventilated Cages.

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### Introduction

Nesting materials are provided in laboratory rodent cages to improve the micro-environment and encourage the animals to display natural behaviour. Nesting material is an easily applicable form of environmental enrichment and may enhance the well-being for laboratory mice (Van de Weerd et al, 1997). A 'good' nest should provide the animal with a place for resting and protection from any aggressive cage mates. The purpose of this study was to determine the most suitable nesting material that presented the clearest visibility of the mice housed within ISOcages. This research will be utilised during a forthcoming Containment Level 3 experiment involving Japanese Encephalitis Virus. It has been advised that the cages should remain sealed for 5-7 days post infection.

### Methods

Male and female CD-1 mice from Charles River UK were used for this experiment. They were housed in groups of 4 in Techniplast ISOcages. Each cage was provided with a nest sample (Table 1) and left to habituate for 1 week. The cage was cleaned and fresh nesting material was provided on a weekly basis.

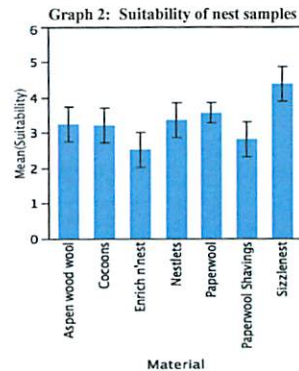
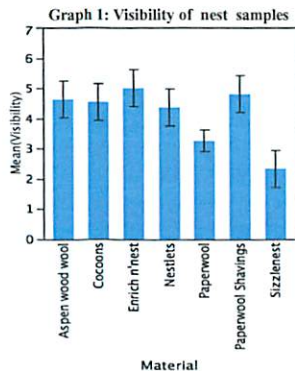
Table 1: nesting samples tested (supplied by Datesand)

Cage 1-Male	Cage 2-Female	Cage 3-Male	Cage 4-Female	Cage 5-Male	Cage 6-Female
Paperwool	Paperwool	Paperwool	Paperwool	Paperwool	Paperwool
Enrich n'nest	Enrich n'nest	Sizzlenest	Sizzlenest	Paperwool Shavings	Paperwool Shavings
Nestlets	Nestlets	Cocoons	Cocoons	Aspen Wood Wool	Aspen Wood Wool

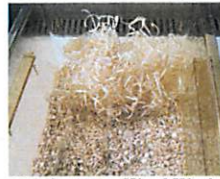
After the habituation period the mice were observed daily at 14:00 for 3weeks. Observations were made for suitability of the nest, visibility and welfare of the mice.

### Results

The Paperwool was used as a control nesting material, as this is the nest widely used in our facility at present. The data was analysed and the nesting materials were compared using Anova followed by a Tukey's test. No significant differences were found between the males and females for suitability or visibility with this nest. The nest with the best visibility was the Enrich n'nest, with no significant differences between the other samples. The Sizzlenest had the poorest visibility.



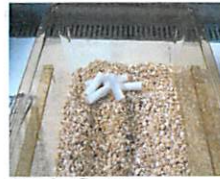
For suitability, Sizzlenest scored the highest, followed by Paperwool and Nestlets. The Enrich n'nest was found to be the least suitable.



Day 0 - Aspen Wood Wool



Day 7 - Aspen Wood Wool



Day 0 - Cocoons



Day 7 - Cocoons



Day 0 - Enrich n' nest



Day 7 - Enrich n' nest



Day 0 - Nestlets



Day 7 - Nestlets



Day 0 - Paperwool Shavings



Day 7 - Paperwool Shavings



Day 0 - Sizzlenest



Day 7 - Sizzlenest

Table 2 : Nesting samples cost per cage over 4 week duration of study.

Material	Quantity bought	Units	Cost	Volume used - units / cage	Cost / Cage	Cost / Cage over study
Aspen Wood Wool	3000	g	£18.63	6.5	£0.04	£0.16
Cocoons	6000	Pieces	£150.00	6	£0.15	£0.60
Enrich n'nest	8000	g	£38.30	14	£0.07	£0.27
Nestlets	3600	Pieces	£206.94	4	£0.23	£0.92
Paperwool	10000	g	£18.81	3.5	£0.01	£0.03
Paperwool Shavings	10000	g	£18.81	17	£0.03	£0.13
Sizzlenest	10000	g	£35.02	17	£0.06	£0.24

### Discussion

Although the results indicate that the Enrich n'nest proved to have the best visibility of the mice, it scored the lowest for suitability. The mice did not really manipulate the material and construct a good nest. Also, it became slightly stained and damp after 5 days in the cage. The Sizzlenest remained completely clean and dry for the duration of the study. The mice also managed to construct a good nest with this material, which resulted in the poor visibility score. All of the nesting materials tested had no effect on the welfare of the female mice. Group housed females have no social hierarchy and therefore no displays of aggression were observed. Female mice tend to build the highest quality nests (Hess et al, 2008). The males were observed to display moments of aggression. Their nests were not constructed as well as the females, and did not provide an adequate shelter to hide from cage mates. The presence of any of the nesting materials tested provided the animals with environmental enrichment. Routinely providing a nesting material is an effective and inexpensive form of appropriate environmental enrichment for laboratory mice (Sherwin, 1997). The cost of the nesting samples used for the study were also considered (Table 2). The Paperwool was found to be the cheapest and the Nestlets to be the most expensive nesting material. The Sizzlenest was found to be cheaper than the Enrich n'nest.

### Conclusion

Since there were no significant welfare concerns it would be appropriate to use Enrich n'nest, even though this nesting material had the lowest score for suitability. With this in mind, given the high performance of the Sizzlenest in this category, a repeat of the experiment using a reduced amount would be preferred. The Nestlets scored quite well in both suitability and visibility, so maybe they would be an appropriate nesting material for future studies. If cost was a factor, Sizzlenest would be the choice for a nesting material. This is cheaper than Nestlets and if using a reduced amount would cost even less. Above all, the welfare of the mice and a nesting material that provides the best visibility is the greatest concern.

### References

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