

Influence of Bedding, Cage Design, and Stock Density on Rat Urinary Aeroallergen Levels

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We have evaluated the influence of husbandry methods on rat urinary aeroallergen (RUA) levels. Sixty male rats were kept in a room assigned specifically to this study. Eight hour static air samples were taken at 2 l/min, and RUA level was measured by RAST inhibition [Gordon, 1992]. We investigated bedding type, cage design, and stock density.

Animals were housed for 2 weeks, sequentially, on two grades of wood-based bedding (types A & B, contact beddings) and over absorbent pads (type C, noncontact). The geometric mean (GM) RUA levels were 6.2 (A), 7.8 (B), and 2.5 $\mu\text{g}/\text{m}^3$ (C) ($p < 0.001$). A reduction in RUA levels from 1.4 to 0.3 $\mu\text{g}/\text{m}^3$ was observed when 30 animals were housed on type A bedding, in open-top as compared to filter-top cages ($p < 0.001$). Reducing stock density from 60 rats (3.1 rats/ m^3) to 0 rats, in groups of 15 rats per week, reduced the RUA levels to 8.1, 3.6, 1.8, 0.9, and 0.1 $\mu\text{g}/\text{m}^3$. Limited particle sizing showed more than 80% of the RUA was carried on particles 8 μm diameter, regardless of bedding type.

Stock density, bedding type, and cage design each greatly influence RUA levels. We recommend that contact bedding should be avoided and stock densities reduced to minimize the risk of RUA exposure and the risk of developing allergy among animal husbandry personnel.

REFERENCES

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