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Use of Corncob

as Bedding Material for Labratory Rodents

A list of published unfavorable characteristics of corncob bedding.

Corncob is widely used in North America, South America and Asia as bedding material for laboratory mice and rats because of its characteristics with respect to inhibiting the accumulation of ammonia, especially when using static isolator caging. Furthermore, in North America corncob is a cheap product because of its unlimited availability. Beside the positive characteristics outlined above, corncob bedding is linked to unfavorable characteristics, too, which limit the use of corncob as premium bedding for rodents in research.

Please find below a list of published unfavorable characteristics of corncob bedding:

- hardest and heaviest of all bedding types [3]
- highest density among all bedding types resulting in significantly higher costs
- abrasiveness which may cause foot lesions [7]
- unsuitable as nesting material[7]
- in preference tests, both mice and rats rejected cages with pure corncob bedding [2,4,13]
- corncob expands and adheres during autoclaving, requiring the need to dissociate after steam sterilization [7]
- off-gassing of acetic acid, presumably from the decay of residual organic matter [12]
- lower water absorption compared to wood-based bedding [4]
- mold growth when getting wet, thus, recommended by manufacturers not to be used right out of the bag [3,7]
- risk of high contamination with molds like Fusarium sp. and Cladosporium sp.11 and spores of other fungus [14]
- highest risk for mycotoxin existence! Mycotoxins are metabolites of toxicological concern from molds. Most common mycotoxins in corncob are deoxynivalenole (DON), zearalenone (ZEA), ochratoxin A, HT-2 toxin, T-2 toxin, fumonisins B1 and B2 and others. Furthermore, carcinogenic aflatoxins (B1, B2, G1, G2) may exist in corncob, too; especially when grown in temperate and warm climates [16]. Generally, mycotoxins cannot be removed by steam sterilization (autoclaving) or irradiation. [3]
- zearalenone (ZEA) is an estrogenic mycotoxin which significantly advances time of vaginal opening in Cd1 mice and, thus, may impact the study results evaluating the estrogenic activity of endocrine disrupting compounds [8,15,16,17]
- fumonisin B1 cause liver cancer promotion and subchronic liver and kidney effects [18]
- another endocrine-disrupting agent found in corncob may influence behavioral and physiologic reproductive response profiles and malignant cell proliferation [9,10]
- highest levels of endotoxins and coliforms, respectively, found in corncob bedding [19]
- only bedding where animals have been observed to ingest their bedding in quantities larger than trace amounts [3]
- corncob bedding reduced the efficiency of feedconversion in mice fed a high-fat diet [1]
- mice housed on corncob bedding showed increased blood glucose levels and decreased triglyceride levels versus those housed on wood chip bedding [20]
- rats on corncob bedding showed a significant decrease in the amount of time spent in slow-wave sleep compared to wooden bedding [6]
- altered mechanical sensitivities seen in rat models of inflammatory and neuropathic pain and overt pain behaviors were observed in corncob housed rats corncob bedding alters the effects of estrogens on behavior and brain function [5]

LITERATURE

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