

The Safety of Mattresses Treated With Ultra-Fresh Anti-Microbial Using Thiabendazole

As an antimicrobial treatment the use of Thiabendazole offers a safe and effective choice. This is an active ingredient that after numerous reviews by different government agencies around the world has a very favorable safety profile. Thiabendazole is used as an antimicrobial treatment to protect manufactured goods, it is used as a pharmaceutical ingredient in consumer shampoos and in topical preparations to treat fungal infections. It has agricultural uses as an anti-fungal treatment for livestock and for the post-harvest treatment of crops.

Thiabendazole has low toxicity. The acute oral LD50 as determined on rats is given as 3100 mg/kg bw. By comparison the acute oral LD50 for aspirin is 200 mg/kg bw. Similarly the acute dermal LD50 is greater than 2000 mg/kg bw. Scientists consider anything with a dermal LD50 value of 2000 mg/kg bw or greater to be effectively non-toxic. Testing also showed that Thiabendazole is not a sensitizer. The LC50 value for Thiabendazole is 0.5 mg/L which was the maximum concentration of Thiabendazole that testers could suspend in the air.

As for chronic effects, Thiabendazole has been shown to be non-mutagenic. It is non-genotoxic *in vivo* though it did induce induction of aneuploidy *in vitro* at high concentrations. Testing has demonstrated that it is not a reproductive toxin nor is it teratogenic nor neurotoxic. The only indication of cancer was at high doses of 10 mg/kg/d over a two year period. For a 70 kg adult this is the equivalent of eating 0.7 kg (or 1.5 lbs) of Thiabendazole every day for two years. Lower exposures failed to show any increase rates of tumors.

In addition to low toxicity, Thiabendazole's physical properties and the use patterns adds to its safe use as an antimicrobial to protect mattresses. Thiabendazole is relatively insoluble in water. As a solid substance (melting point 297° C) it has an extremely low vapour pressure, 5.2×10^{-7} Pa at room temperature. By comparison water has a vapour pressure of 2300 Pa or 10^{10} times higher. This means that Thiabendazole does not evaporate into the air.

When used in polyurethane foam as in mattresses the Thiabendazole is added as the polyurethane foam is made so that the Thiabendazole is embedded throughout the polyurethane foam. It becomes part of the foam in the same way that gravel becomes part of the concrete as it is embedded in the cement.

An added level of safety is achieved by the fact that the level of Thiabendazole used is typically between 0.03 and 0.08% by weight. Therefore in a 40 kg mattress the total amount of Thiabendazole present will be between 3 and 9 mg, the equivalent of less than 1/10 of a teaspoon.

Thiabendazole is an effective antimicrobial treatment to protect mattresses and other manufactured goods from microbial growth. Yet due to its inherent low toxicity, physical properties and use patterns it is safe.