

# FOOD AND ENVIRONMENTAL FACTORS IN HUMAN DISEASE

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British Society for Allergy and Environmental Medicine  
with

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WEDNESDAY 4 JULY      ABSTRACTS

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9.55            Barry                    Cot Mattress Biodeterioration and  
                  RICHARDSON            the Sudden Infant Death Syndrome

Cot mattresses become naturally infected by *Scopulariopsis brevicaulis*, a fungus which is common on proteins such as meat, cheese, milk, wool and leather. The infection, prompted by nitrogen compounds in perspiration, is invisible. *S. brevicaulis* converts nitrogen compounds into ammonia (nitrogen trihydride) as a stage in protein formation but fire retardant and preservative compounds of other Group V/Vb elements phosphorus, arsenic and antimony can similarly generate the toxic trihydrides phosphine, arsine and stibine.

Toxic gas generation is a threat to health but may also cause sudden infant death syndrome. SIDS is only recognised in countries which use plastic and fire retardant mattresses. SIDS risk is greatest for infants between 1 and 5 months sleeping in the prone position and overwrapped, particularly in poorer homes. Exposure to the heavier than air gases is increased by the prone position and overwrapping which also causes hyperthermia and increased gas generation through heavy perspiration and high temperatures. Poisoning causes headache and irritability, active older infants dislodging bedding and dispersing the gas. Infants on used mattresses are not at risk until warmth and perspiration has reactivated the infection. SIDS risk is lower for first born infants who tend to use new mattresses which are initially free from infection.

In adults poisoning involves depression of the central nervous system and erythrocyte haemolysis. SIDS is consistent with suppression of ventilation through action on the CNS but haemolytic anaemia is not generally reported, although it may be confined to the lungs. Hyperthermia will cause hyperventilation and declining blood carbon dioxide leading to apnoea. Hyperthermia will also increase gas generation and eventual inhalation may contain high gas concentrations which will form toxic phosphonium, arsonium and stibonium hydroxides in the blood which will also absorb carbon dioxide, further suppressing ventilation. Death may be caused by both toxic interference with cell metabolism and oxygen deficiency.