

01 - Health risks and safety hazards related to insects and mites in stored products

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Abstract

In 2008, a publication appeared describing the health risks related to the presence of (insects, mites, fungi, rodents and birds as pest organisms in stored products. For each organism the publication listed the main species, current pest management procedures, and current control methods. The main part of each section dealt with health hazards of each organism and risk assessment of these hazards adding key actions for the future.

For all of the organisms their mere presence in the product represents a contamination and as such is unacceptable. Infestation by insects or mites can adversely affect humans and livestock and thus become a health risk by ingestion of insects or mites - rarely a real threat except at high pest densities - or by induction of allergy, which may develop after previous exposure of humans to the organism, fragments of it or to its excrements. This may be the case for insects. Especially for mites, this risk is considered to be relatively high due to the small size, ubiquitous presence of storage mites and cross reactivity between their allergens and those from house dust mites. Health risks originating from storage mites have been underestimated. It is recommended that action is taken to elucidate the role of both storage mites and insects in development of allergic reactions. Other health risks stem from pesticides applied to the products to control insects.

Introduction

In 2008, a publication appeared describing the health risks related to the presence of pest organisms (insects, mites, fungi, rodents and birds) in stored products (Reichmuth et al. 2008). It was the result of a collaboration between European experts in each their field.

For each organism the publication lists the main species, current pest management procedures, and current control methods. For all of the organisms their mere presence in the product represents a contamination and as such is unacceptable. The main part of each section deals with the health hazards each organism represents. The health hazards were identified and grouped into direct health hazards, indirect health hazards and health hazards related to control measures. Finally an assessment of the risk level found for each of these hazards was made. Recommended key actions for the future are then given. An extensive literature list is given for each type of organism.

Infestation by both insects or mites can adversely affect humans and livestock and thus become a health risk. The following presents an overview of the findings concerning these two groups of organisms: insects (Hansen, 2008), and mites (Willey & Hansen, 2008), both of which are common as pests in stored products. Details can be found in the publication.

Tabelle Insects

Hazard type	Specification		Risk level
Direct health hazards	Ingestion of whole insects or fragments	Rare cases of clinical illness (Dermestidae, Calliphoridae)	Low, due to low pest densities
	Allergenicity	Inhalant allergy following occupational exposure	High for relevant occupations
		Inhalant and ingestive allergy for general public	Unknown. Contaminated food may be an underestimated source of allergens
Indirect health hazards	Pathogen transmission	Transmission of mycotoxin-producing fungi	Low, due to low pest densities
		Transfer of pathogens	Low, due to low pest densities
	Toxic effects	Carcinogenic excretory products from Tenebrionidae	Low, due to low pest densities

Hazard type	Specification		Risk level
Health hazard from control measures	Pesticide residues	Effect of exposure to low levels in basic food stuffs	Authorities determine MRLs, below which hazards are estimated to be small
	Toxic fumigants	Accidental poisoning	Low, if safety procedures are followed

For insects the following key actions were identified: Allergy is a result of previous exposure to low levels of allergens. Thorough studies must be conducted to elucidate the relationship between insect contamination in food and subsequent allergic reactions in humans.

It is imperative that pest densities are maintained low, and the methods and technology necessary to prevent pest development are available. However, transfer of knowledge to the primary producers should be improved to ensure production of stored products without insect contamination.

It is evident that the risks stemming from insect infestation in stored products are low, due to general low pest densities found in European stores. However, as discussed at the symposium, new developments in the EU policies concerning pesticide registration for this sector, and the development of resistance to insecticides in insect populations are changing this situation. Thus, health hazards from insects in stored products may increase.

Table Mites

Hazard type	Specification		Risk level
Direct health hazards	Allergenicity	Inhalant allergy following occupational exposure	High for relevant occupations
		Inhalant and ingestive allergy for general public	High
Indirect health hazards	Pathogen transmission	Transfer of pathogens (E. coli O157, prions?)	Unknown (low?)

In the light of the severe consequences that mite allergies may have on human health (asthma, anaphylaxis) it is important that (key actions identified)

the frequency and level of mite contamination in stored products is monitored, edical studies are carried to elucidate the level of allergenic reaction to different degrees of exposure to mites in food, a "no effect" level for mites in foodstuffs is established, the risk of mites as vectors of high risk pathogens is reviewed.

Literature

Hansen, L.S., 2008: Insects. Pp 10-21 and 67-74 In: Health risks and safety hazards related to pest organisms in stored products - Guidelines for Risk Assessment, Prevention and Management Council of Europe Public Health Committee. Council of Europe Publishing, Strasbourg, France. ISBN: 978-92-871-6362-2.

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Reichmuth, C., Hansen, L.S., Willey, K. Hamel, D., Pelz, H.-J., Camon, T., Kroos, G. and Pérez, G.H., 2008. Health risks and safety hazards related to insects and mites in stored products. Guidelines for risk assessment, prevention and management. Council of Europe Public Health Committee. Council of Europe Publishing. Strasbourg Cedex., France. 190 pp. ISBN-13: 978-92-871-6362-2.

02 - Pest Control and Constraints in Flour mills

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Abstract

Food factories and especially flour mills are object of severe infestations of pest insects. Mediterranean flour moth *Ephestia kuehniella* and confused flour beetle *Tribolium confusum* belong to the prevailing pests causing expensive precautions and control measures to avoid complaints of customers. The occurrence of pest insects is not in