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 (Wildey & Hansen, 2008), both of which are common as pests in stored products. Details can be found in the publication.

<table>
<thead>
<tr>
<th>Hazard type</th>
<th>Specification</th>
<th>Risk level</th>
</tr>
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<tbody>
<tr>
<td>Direct health hazards</td>
<td>Ingestion of whole insects or fragments</td>
<td>Rare cases of clinical illness (Dermestidae, Calliphoridae)</td>
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<td></td>
<td>Allergenicity</td>
<td>Inhalant allergy following occupational exposure</td>
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<td></td>
<td>Pathogen transmission</td>
<td>Transmission of mycotoxin-producing fungi</td>
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<td></td>
<td></td>
<td>Transfer of pathogens</td>
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<td></td>
<td>Toxic effects</td>
<td>Carcinogenic excretory products from Tenebrionidae</td>
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</tbody>
</table>
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.

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


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 Ephesia 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