Health risks through fumigated containers: Experts discuss research results and values measured by control authorities

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Products transported by sea in containers are often fumigated with biocides as protection against pests. In addition to this, they often contain volatile organic solvents, such as the potentially carcinogenic 1,2-dichloroethane, which can originate from cleaning or manufacturing processes.

In a meeting held at the German Federal Institute for Risk Assessment (BfR) on 16 November 2018, 36 experts from science, monitoring authorities, trade and industry discussed the effects of substances of this kind on health, along with the need for future action.

The participants discussed the following aspects on the health risks posed by fumigated containers at an experts' workshop on 16 November 2018:

Proper fumigation and labelling

Common substances approved for fumigation, such as phosphine, usually evaporate within a short period of time. If used properly a risk to consumers is therefore unlikely according to current knowledge.

However, it also became clear at the workshop, that in many cases containers are not fumigated properly and/or that the containers in question are only poorly marked and labelled, if at all, so that it is not possible to handle them correctly. This conceals the risk of exposure to persons who load, unload or dispatch the containers.

Volatile organic solvents

Apart from the subject of approved biocides there is the issue of the frequent detection of volatile organic solvents. These substances originate from the cleaning of the containers as well as from the products themselves.

In particular the potentially carcinogenic 1,2-dichloroethane has been detected in many cases. In the air of some containers 1,2-dichloroethane concentrations in the ppm range were measured. This poses first and foremost a health risk to everyone who unloads the products from which the solvents degas.

1,2-dichloroethane is given off fumigated products slowly. It may degas over a period of up to two months, which means it is possible that consumers and/or retail personnel can also come in contact with 1,2-dichloroethane or other volatile solvents.

The analysis of volatile substances in containers is technically demanding. To determine how severely contaminated the air in a container is, the measurement has to be made before the container is ventilated.

From the perspective of health risk assessment, it is necessary to record also potentially health-damaging substances beyond the spectrum of fumigants authorised as biocides. This is not fully possible at the moment, however, due to a lack of measuring methods. For this reason, a continuous exchange of information between the workshop participants, especially with regard to the further development of methods for measuring volatile solvents, was considered useful. Providing protection against the health risks posed by goods transported in

fumigated containers is a joint challenge faced by authorities responsible for market monitoring and consumer health protection.

Research project: Influence of fumigation on the aroma of sunflower seeds
Apart from the possible direct effect on humans, the research project also focused on effects on foods. The BfR and Julius Kühn Institute (JKI) demonstrated that fumigation with the biocide phosphine and the solvent 1,2-dichloroethane alters the aroma of sunflower seeds.

Whether or not this influence on quality also exists with other agricultural products is subject of further examinations at the BfR.

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. It advises the Federal Government and Federal Laender on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

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