German Federal Institute for Risk Assessment

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Microplastics: Discrepancy between scientific knowledge and public perception

Based on current knowledge, there is no reliable evidence of health risks to humans

Microplastics can now be found almost everywhere: in the air we breathe, in food and even in human organs. Whether and to what extent this forms a health risk is the subject of intense debate among scientists and the general public. While scientific assessments do currently not allow any conclusive statements to be made about the health effects of microplastics, the public is concerned. In a new review recently published in the German Medical Journal under the title "Microplastics: Evidence on health effects and public perception", the German Federal Institute for Risk Assessment (BfR) provides an up-to-date assessment of the gap between public perception and scientific knowledge.

The study published in Deutsches Ärzteblatt highlights how much public perception differs from scientific assessment. In a representative survey of the population, over 80 per cent of respondents stated that microplastics in the body could exacerbate existing diseases. However, according to the current state of scientific knowledge, microplastics pose a relatively low health risk to humans. At the same time, further research is needed, particularly with regard to the exact mechanisms of action of microplastics in the human body.

Microplastic particles enter the organism primarily through inhalation or ingestion. However, a large proportion of the particles ingested are apparently shed unchanged. Only a small proportion can enter the tissue or blood under certain conditions. Individual studies have detected microplastics in the brain, lungs and reproductive organs of humans, among other places. However, these findings do not allow any conclusions to be drawn about possible health effects. Based on current knowledge, there is no evidence of a causal link between the prevalence of microplastics in the body and specific diseases.

The assessment of health risks is also complicated by methodological limitations, as studies are often based on small samples and/or there are methodological uncertainties in the

identification and quantification of microplastics. To date, there are neither internationally standardised detection methods nor harmonised study protocols that would allow for a comparable and reliable risk assessment. In addition, there are considerable uncertainties regarding the long-term effects of chronic exposure, particularly with regard to very small particles (nanoplastics), whose behaviour in the organism is largely unknown.

The BfR continuously monitors scientific developments in this domain and, together with the Austrian Agency for Health and Food Safety (AGES), is hosting a consumer protection forum entitled "Microplastics – What do we know today?" The event will highlight the current state of science and promote exchange between experts from research, society, business and politics. The challenge of risk communication is to present scientific uncertainties transparently without suggesting unsubstantiated health risks. The aim is to achieve fact-based and objectively balanced communication.

Further information on microplastics is available on the BfR website

Questions and answers on microplastics: facts, research and open questions
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/microplastics-facts-research-and-open-questions/

BfR press release, Microplastics – What do we know today?
https://www.bfr.bund.de/en/press-release/microplastics-what-do-we-know-today/

BfR communication, Microplastics in the brain? The BfR assesses new study – no evidence of health risks to date
https://www.bfr.bund.de/en/notification/microplastics-in-the-brain-bfr-evaluates-new-study-so-far-no-evidence-of-health-risks/

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the German Federal Ministry of Agriculture, Food and Regional Identity (BMLEH). It protects people's health preventively in the fields of public health and veterinary public health. The BfR provides advice to the Federal Government as well as the Federal States ('Laender') on questions related to food, feed, chemical and product safety. The BfR conducts its own research on topics closely related to its assessment tasks.

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