German Federal Institute for Risk Assessment

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Study on preservatives and cancer has shortcomings

Federal Institute for Risk Assessment issues critical assessment

According to a study conducted in France, six preservatives are linked to an increased cancer risk. The recently published study has received significant media attention. It is based on the evaluation of questionnaires completed online by more than 100,000 participants in the NutriNet-Santé cohort study over an average period of 7.6 years.

In the view of the German Federal Institute for Risk Assessment (BfR), the study is subject to a number of significant limitations and uncertainties. The BfR therefore sees no reason at this stage to conduct a new assessment of the health risk posed by the preservatives in question on the basis of this study.

Link to the study: https://www.bmj.com/content/392/bmj-2025-084917

In the study, the preservatives contained in the food were inferred from the participants' nutrition reports. At the start of the study, the participants (a total of 105,260) were free of malignant tumours. During the study period, 4,226 of them developed cancer.

Eleven of the 17 preservatives examined were not associated with the occurrence of cancer. For the remaining six substances, there was a statistically significant association with an increased incidence of cancer. Should the result for these preservatives be confirmed, the study authors believe this would be a reason to reconsider their current regulatory status.

The BfR has conducted an assessment of the publication and, in this context, points to a number of weaknesses in the study:

- **Causality questionable**: The *NutriNet-Santé study* is an observational study that investigated statistical correlations (associations) between preservatives and the occurrence of cancer. However, statistically significant associations cannot automatically be interpreted as causal relationships.

- **Multiple testing:** The study examines associations between a large number of preservatives and the occurrence of cancer. This makes it susceptible to the phenomenon of multiple testing: if several statistical tests are carried out, it is to be expected that some will, by chance, yield a false-positive result. As many preservatives were investigated in this particular publication, positive associations may be due to chance.

- **Confounders**: A major problem in observational studies is the occurrence of confounders. These must be taken into account during data analysis. This is done, amongst other things, using statistical methods (adjustment). Despite extensive adjustment, residual confounding may remain. For example, it is difficult to separate the effect of certain preservatives from that of the food in which they are prevalent. For instance, the intake of sulphites (a preservative in wine) is linked to wine consumption. The observed cancer risk associated with sulphites may therefore be attributable more to alcohol consumption than to the preservative itself. Regular alcohol consumption is an established risk factor for certain types of cancer.

- **Unclear intake**: The data used to estimate the intake of preservatives (exposure) in the study was based on self-reported information from the participants. Inaccurate or incorrect answers lead to uncertainty in the estimates of the preservatives ingested through food.

- **Questionable plausibility:** For acetic acid and acetates, the study reports a 12 per cent (acetic acid) and 15 per cent (acetates) increased cancer risk (hazard ratios of 1.12 and 1.15 respectively). This is of the same order of magnitude as the increased cancer risk identified in the study for sorbates (14 per cent), sulphites (12 per cent), sodium erythorbate (12 per cent) and potassium nitrate (13 per cent). Acetic acid and acetates are natural components of many foods and are also produced in significant amounts by the human metabolism. This calls into question the plausibility of the associations identified for these preservatives and suggests that they should be considered of little relevance.

- **Re-assessed:** The preservatives addressed in the study were re-assessed by the European Food Safety Authority (EFSA) as part of the programme for the re-assessment of authorised food additives. With regard to potential mutagenic (genotoxic) and carcinogenic properties, the EFSA had no health concerns regarding the additives in question.

Conclusion: For the majority of the preservatives examined in the study, no association with the occurrence of cancer was found. The observed associations are subject to uncertainties and should be interpreted with caution. It is unclear whether the observed associations are the result of multiple testing. Even if the observed associations were to describe actual effects, it remains unclear whether these are truly attributable to the additives. As the authors of the publication also emphasise, the results would need to be confirmed independently. From the BfR's perspective, this publication does not justify changing the risk assessments of the preservatives in question carried out by EFSA.

Further information on the BfR website regarding food additives:

Risk assessment on food additives
https://www.bfr.bund.de/en/food-safety/assessment-of-substance-risks-in-foods/health-risk-assessment-of-food-additives/

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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