



## Substantia non grata

**Undesirable substance: in 2021, retailers recalled numerous food products that contained ethylene oxide and its conversion product 2-chloroethanol. What was the problem with bars, snacks and salad toppings?**

Ethylene oxide is an active substance with antibacterial and antiviral properties. It was used in pesticides to protect fruits and vegetables from bacteria and fungi after harvest. Since 1991, however, any food-related uses of this sweet smelling gas have been banned throughout the EU. The reason - it can be mutagenic or carcinogenic.

Due to increased evidence, among others in sesame seeds and locust bean gum, the German Federal Institute for Risk Assessment (BfR) has assessed whether and to what extent ethylene oxide residues are problematic for human health. The result confirms the previous assessment: based on current data there is no intake level for ethylene oxide without a health risk. The substance therefore is considered undesirable in food.

### Conversion product also problematic?

Ethylene oxide is very reactive and is, amongst other things, rapidly converted to 2-chloroethanol. Usually it is only 2-chloroethanol which is detected in plants and foods treated with ethylene oxide. The human health risk associated with 2-chloroethanol is the subject of further

research. Also for this substance there are indications for potential mutagenicity in vivo. Producers must therefore avoid residues of ethylene oxide or 2-chloroethanol in food as far as technically possible. If the food monitoring authorities nevertheless detect residues above the legally defined maximum residue level, the products are recalled.

When assessing health effects, the authorities need to know how to classify the corresponding detections in food. The BfR has therefore determined the daily intake level for ethylene oxide as means of guidance. At this level, daily intake would potentially lead to one additional case of cancer for one in 100,000 people. This estimate is based on the assumption of a lifelong average consumption. Irrespective of this, the following applies: any avoidable entry of "genotoxic and carcinogenic" substances such as ethylene oxide into food should be omitted. ■

**More information:**  
[www.bfr.bund.de/en](http://www.bfr.bund.de/en) > A-Z index: ethylene oxide