



A matter of taste

There is a vast variety of flavouring substances – but data gaps hinder their assessment regarding health effects.

Flavouring substances turn foods into true taste sensations. These chemical compounds are added to many products such as beverages, confectionery, snacks, dairy products and convenience foods. Their role is to add or enhance a specific odour or taste. As foods can lose their inherent flavour during production, transport and storage, many of them would taste bland without flavourings. But these substances can do even more than that: they also ensure consistency of taste – after all, you want your favourite chips to taste the same after every potato harvest.

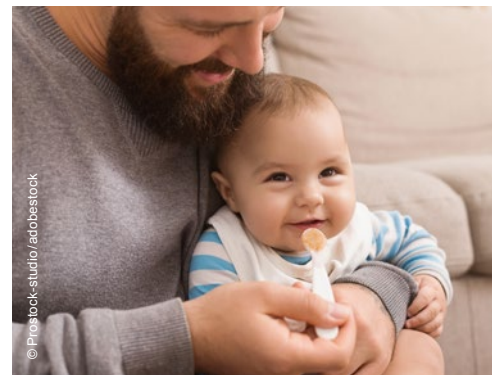
Around 2,500 chemically defined flavouring substances are permitted in the EU and are used in the manufacture of flavourings. Only complex mixtures of flavouring substances and other substances such as food additives, carriers and solvents form flavourings which then appear in solid or liquid form and can be used for food flavouring. A flavouring can consist of more than 100 components. Even small amounts, in the range of milligrams to grams, can be sufficient to add taste into a kilogram of food.

Natural or nature-identical – which terms are currently applicable?

The previous German Flavouring Regulation made a distinction between natural, nature-identical and artificial flavouring substances. However, the terms 'nature-identical' and 'artificial' are no longer used in the EU Flavouring Regulation that now also applies in Germany. "Whether a substance is of natural origin or not is irrelevant for its hazard potential and the safety of consuming this substance. The chemical structure and the associated chemical and physical properties are decisive," explains Dr. Rainer Gürtler, Food Toxicologist at the German Federal Institute for Risk Assessment (BfR). The flavouring substances do not necessarily need to originate from the foods to which they lend their typical flavour. They can also originate from different plant-based or animal materials, be produced from microorganisms such as bacteria and yeasts, or be completely produced via chemical synthesis.

Their labelling is regulated in the EU Flavouring Regulation and the EU Food Information Regulations. For example, if strawberry fruit is indicated as a flavouring source on a product package, the claim 'natural' is permitted only if at least 95 per cent of the flavouring component originates from this source. Therefore, a yoghurt does not necessarily contain a fresh berry - its flavouring can also come from strawberries that have been freeze-dried, for example. If less than 95 per cent is from a consistent natural source, it must be called "natural strawberry flavouring with other natural flavourings" if the flavouring substance is only partly derived from strawberries but their flavour is easily recognisable.

One of the most popular fragrance and flavouring substance is vanillin: according to the German Association of the Flavour Industry (Deutscher Verband der



What you need to know

It is often said that flavourings have an effect on eating habits and that we even eat more of the food than necessary because of them. Is that true? "We have no reliable data to support this assumption," says Food Toxicologist Dr. Rainer Gürtler. However, there are some indications that sensory experiences during infancy can influence the taste perception and have an effect on food preferences later in life. In the view of the BfR, flavouring substances should therefore not be used in the production of infant formula or in foods for special medical purposes for infants in the first 16 weeks of life.

More information:
BfR Opinion No. 049/2020 of 3 November 2020

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New Reference Laboratory

Is what's on the packaging really all that's in a product? Germany is the first EU member state that established a Reference Laboratory for Food Additives and Flavourings. In future, new analytical methods will be developed at the BfR to monitor, among other things, the use and intake of additives and flavourings. Tests will also be performed to determine whether flavourings are of natural or synthetic origin. Analytical methods will also be applied to provide evidence of a potential use of additives and flavouring substances that have not been approved.



Aromenindustrie), global annual demand amounts to 15,000 tons – whether for chocolate, ice cream, baked goods, beverages, cosmetics or pharmaceutical products. Demand thus considerably exceeds real vanilla bean resources, in addition the methods of extraction are relatively expensive. Vanillin is thus chemically produced on a large scale, including from fossil raw materials. According to the association, more than 90 per cent of the vanillin used worldwide today comes from synthetic production.

There are still several data gaps

Apart from labelling, the EU Flavouring Regulation also governs the use of flavouring substances. According to this regulation, the vast majority of flavouring substances may be used without restriction, but some may be added only to certain food categories in specified maximum amounts. Although scientific evaluations are now available for almost all flavouring substances, there are several data gaps. “Several hundred flavouring substances have not yet been finally evaluated by the European Food Safety Authority (EFSA) – but despite this, they have been permitted for unrestricted use,” says Gürtler. The EFSA is calling for more reliable information con-

cerning the amounts used and then, depending on these data, additional toxicological studies where applicable, before the evaluations can be finalised.

The total number of around 2,500 flavouring substances, all of which have been on the market for decades and have had to be assessed at EU level since 2000, is simply huge: “Groups of chemically similar substances were therefore formed and assessed, and priority was given to the evaluation of the genotoxicity,” explains Gürtler. It took 20 years just to carry out these evaluations of groups of chemically similar flavouring substances. If the flavouring substances had all had to be toxicologically tested and assessed individually, it would have taken much more time.

So far, 45 flavouring substances have been deleted from the so-called Union list of the EU regulation, some of them due to health concerns and others because concerns could not be addressed and the flavour industry then did not submit additional toxicological data but refrained from further use of the substances concerned.

The data required to estimate intake have to-date been provided exclusively by the flavour industry. While production and import volumes are generally available, reliable information concerning the volumes used in food is lacking for a large number of flavourings. “The intake levels of around 1,300 flavouring substances could only be roughly estimated so far,” explains Gürtler. “Discussions are now taking place at the EU-level on how estimates of intake levels can be improved,” says the expert. Often, for example, there are also no suitable analytical methods available that are capable of detecting the often very low content of the individual substances in food. Developing and standardising methods for this is one of the tasks of the newly established Reference Laboratory for Food Additives and Flavourings at the BfR (see box). ■

More information:
www.bfr.bund.de/en > A-Z Index: Flavourings