Questions and Answers on Food Additives

What are food additives?
Additives are substances used for a variety of reasons - such as preservation, colouring, sweetening, etc. - during the preparation of food. The European Union legislation defines them as "any substance not normally consumed as a food in itself and not normally used as a characteristic ingredient of food, whether or not it has nutritive value, the intentional addition of which to food for a technological purpose in the manufacture, processing, preparation, treatment, packaging, transport or storage of such food results, or may be reasonably expected to result, in it or its by-products becoming directly or indirectly a component of such foods."

What are additives used for?
Additives can be used for various purposes. EU legislation defines 26 "technological purposes." Additives are used, among other things, as:

- **Colours** – they are used to add or restore colour in a food
- **Preservatives** – these are added to prolong the shelf-life of foods by protecting them against micro-organisms;
- **Antioxidants** – they are substances, which prolong the shelf-life of foods by protecting them against oxidation (i.e. fat rancidity and colour changes)
- **Flour treatment agents** – they are added to flour or to dough to improve its baking quality.

Are food additives safe?
The safety of all food additives that are currently authorised has been assessed by the Scientific Committee on Food (SCF) and/or the European Food Safety Authority (EFSA). Only additives for which the proposed uses were considered safe are on the EU list.

As most of the evaluations date back to the 80’s and 90’s, some even to the 70’s, it is only appropriate to re-evaluate all authorised additives by EFSA. The re-evaluation will be completed by 2020. Based on the advice of EFSA the Commission may propose a revision of the current conditions of use of the additives and if needed remove an additive from the list.

As a result of the re-evaluation programme, so far the use of three food colours has been revised because EFSA decreased their acceptable daily intake (ADI) and considered that human exposure to these colours is likely to be too high. Therefore, the maximum levels of these colours that can be used in food will be lowered in early 2012. This reference concerns E 104 Quinoline yellow, E 110 Sunset Yellow and E 124 Ponceau 4R.
How is the safety of food additives evaluated?
EFSA assesses the safety of the food additives. The substances are evaluated based on a dossier, usually provided by an applicant (normally the producer or a potential user of the food additive). This dossier must contain the chemical identifications of the additive, its manufacturing process, methods of analyses and reaction and fate in food, the case of need, the proposed uses and toxicological data.

The toxicological data must contain information on metabolism, sub-chronic and chronic toxicity, carcinogenicity; genotoxicity, reproduction and developmental toxicity and, if required, other studies.

Based on this data, EFSA determines the level below which the intake of the substance can be considered safe – the so-called Acceptable Daily Intake (ADI). At the same time, EFSA also estimates, based on the proposed uses in the different foodstuffs requested, whether this ADI can be exceeded.

In case the ADI will not be exceeded, the use of the food additive is considered safe.

Is it possible to consume food additives at dangerously high levels?
When EFSA estimates the possible exposure to a food additive, it considers the maximum level requested to be added in the different foodstuffs. In addition, EFSA assumes that the largest quantities of these foodstuffs are eaten on a daily basis. Only when this estimated exposure via the different foodstuffs remains below the ADI, EFSA will consider that the proposed use of the substances is safe. If the ADI is exceeded, the Commission can decide to restrict the use of the additive or not to authorise it at all.

The presence of food additives should therefore be considered safe even for consumers that eat large quantities of foodstuffs to which the additives have been used at the maximum permitted level.

What are the conditions to authorise food additives?
A food additive may only be authorised if its use meets the following conditions:
- it does not, on the basis of the available scientific evidence, pose risks to the health of the consumer at the level of the proposed use;
- there is a reasonable technological need that cannot be achieved by other means; and
- its use does not mislead and must have benefits for the consumer.

When authorising food additives other relevant factors may also be considered. These could include ethics, traditions, the environment, etc.

What are the benefits for the consumer?
The EU legislation provides that food additives must have advantages and benefits for the consumer. Therefore, they have to serve one or more of the following purposes:
- preserve the nutritional quality of the food;
- provide necessary ingredients or constituents for foods manufactured for groups of consumers with special dietary needs;
- enhance the keeping quality or stability of a food or improving its organoleptic properties, provided that the consumer is not misled;
- aid the manufacture, processing, preparation, treatment, packing, transport or storage of food, including food additives, food enzymes and food flavourings, provided that the food additive is not used to disguise faulty raw materials or cover up unhygienic practices.

**Food colours may mislead the consumer – why are they authorised?**
The use of food colours is considered acceptable for the following purposes:
- to restore the original appearance of food of which the colour has been affected by processing, storage, packaging and distribution;
- to make food more visually appealing;
- to give colour to food otherwise colourless.

**The use of food colours must always comply with the general condition that they do not mislead the consumer.** For example, the use of colours should not give the impression that it contains ingredients that have never been added.

**Can any substance be used as food additive?**
Only food additives that are listed in the EU legislation can be added to food and this can be done only under specific conditions.

Additives causing minimum toxicological concerns may be added in almost all processed foodstuffs. Examples include calcium carbonate (E 170), lactic acid (E 270), citric acid (E 330), pectins (E 440), fatty acids (E 570) and nitrogen (E 941).

For other additives the use is more restricted, for example:
- Natamycin (E 235) can only be used as preservative for the surface treatment of cheese and dried sausages
- Erythorbic acid (E 315) can only be used as antioxidant in certain meat and fish products
- Sodium ferrocyanide (E 535) can only be used as anti-caking agent in salt and its substitutes

**Can additives be used in all foodstuffs?**
In some foodstuffs the use of additives is very limited. For unprocessed foodstuffs such as milk, fresh fruit and vegetables, fresh meat and water only a few additives are authorised.

The more a foodstuff is processed, the more additives are authorised and used. Confectionary, savoury snacks, flavoured beverages and desserts are some products falling under this category of highly processed foodstuffs, where a lot of additives are authorised for use.

**Is there a list of authorised food additives?**
The additives that are authorised in foodstuffs and their conditions of use are listed Annex II of Regulation (EC) No 1333/2008 on food additives. Only additives that are in that list are authorised under specific conditions. The additives are listed on the basis of the categories of food to which they may be added.


Through this database the consumer or business operator can find out what additives are authorised in a particular food.
What is the procedure for the authorisation of the use of food additives?

The authorisation procedure for food additives is laid down in Regulation (EC) No 1331/2008. An additive is usually authorised following an application to the European Commission by an interested party. For new additives, the Commission will request EFSA to assess the safety of the substance. After EFSA has given its opinion (within nine months following the request), the Commission, together with food additive experts of all Member States, will consider the possible authorisation. The safety assessment, the technological need, the possibility for misuse and the advantages and benefits for the consumer are all taken into account.

If considered appropriate, the Commission will prepare a proposal for possible authorisation of the additive and present it for vote at the Standing Committee on the Food Chain and Animal Health (SCoFCAH). If SCoFCAH supports the proposal it will be presented to the Council and the European Parliament. They can still reject it in case they consider that the authorisation does not comply with the conditions of use set out in the EU legislation.

How is the consumer informed about the use of additives?

Additives in foodstuffs are labelled according the rules set out in Directive 2000/13/EC. Food additives are food ingredients and should be mentioned in the ingredients list. The additives must be designated by the name of their functional class, followed by their specific name or EC number. For instance: "colour – curcumin" or "colour: E 100".

This E-number can be used in order to simplify the labelling of substances with sometimes complicated chemical names.

Is it possible to prepare food without additives?

It is indeed possible to prepare food without the use of any additives. Additives are normally not added to food prepared at home. However at home, food is usually consumed directly. In addition home preparation may also have less influence on the appearance compared to industrially processed food.

Not all industrially prepared foodstuffs need additives. Examples include certain types of bread, some kinds of prepared meals, certain breakfast cereals, etc. Whether additives are needed or not, depends on the production process, the ingredients used, the final appearance, the required preservation, the need to protect against possible development of harmful bacteria, the kind of packaging, etc.

On the other hand, it is worth mentioning that many foodstuffs contain naturally occurring substances, which are at the same time authorised as food additives. For example, in apples one can find riboflavins (E 101), carotenes (E 160a), anthocyanins (E 163), acetic acid (E 260), ascorbic acid (E 300), citric acid (E 330), tartaric acid (E 334), succinic acid (E 363), glutamic acid (E 620) and L-cysteine (E 920).
What were the approval conditions of Steviol glycosides?

Steviol glycosides are sweeteners extracted from the leaves of the Stevia rebaudiana Bertoni plant, which originates in Paraguay.

Following the application to the European Commission, EFSA was requested to assess the safety of the substance. In its opinion of March 2010, EFSA concluded that the sweeteners are not carcinogenic, genotoxic or associated with any reproductive/developmental toxicity, and established an Acceptable Daily Intake (ADI) of 4 mg/kg body weight/day. Conservative estimates of steviol glycosides exposure, both in adults and in children, suggest that it is likely that the ADI would be exceeded at the maximum proposed use levels.

In order to ensure that the exposure is safe for the consumer, the requested uses and use levels had to be revised. Therefore, further consultation with EFSA and the applicants took place to propose levels that are safe and, at the same time, that allow the products to function as sweeteners.

The use of Stevia is now authorised at appropriate levels for 31 different food categories including soft drinks, desserts, confectionary and table top sweeteners.