

Essential Guide to Food Additives (4th Edition)

Edited by Mike Saltmarsh
RSC Publishing
Year of publication: 2013
Hardcover xiii + 299 pages
ISBN: 978-1-84973-560-5



Scientific approach to the evaluation of food additives began in 1955 when Codex Alimentarius was founded by an international expert scientific committee, JECFA, administered jointly by FAO and WHO organisations. The very first list of additives was published in 1957 and among the 135 food colorants reported by the member countries, only 22 passed the toxicological evaluation, while 113 were banned from further use in food. Already at the beginning a certain amount of controversy arose about the additives used in food industry, accompanied by consumers' mistrust. The UN member countries were following the work of FAO/WHO in their attempt to consolidate various areas of food additives, and approving for use in their countries selected additives from the lists of additives recommended by JECFA. However, inconsistent approach and inharmonious national lists of additives created a notion that food produced in another country was not safe because it used additives from the national list of the country where it was produced which was not harmonised with the list of additives in the country where this food was sold, although the lists from both countries had been evaluated by JECFA. In the 1980s Europe started the process of harmonisation of food legislation, which also included food additives, in order to break the barriers of food trade among countries. In spite of that, the use of additives was being severely attacked by consumers' associations claiming that food additives were substances intentionally added to food which by their content and use may harm human health and change the true nature and originality of a food product, and all that with the blessing of scientists and legislators. The associations believed that this was a conspiracy of food manufacturers and politics, who were only interested in profit. This pressure has remained to a greater or lesser extent until today. The only reasonable explanation what food additives are can be conveyed through education *via* classical media such as books. Other media, such as the Internet, newspapers, radio or television, are unreliable sources of information, prone to being partial and taking sides of pros or cons of food additives.

Essential Guide to Food Additives is the fourth edition of this book. While the previous editions were merely supplements to the preceding versions, this last one is a completely revised book that follows changes in the approach of the European food legislation from 2008 regarding food additives. This is an ideal reading for understanding additives as such, the historical overview of the development of food additive legislation, the present situation as well as detailed presentation of each legally permitted food additive.

The book contains 6 chapters written by 15 authors from different European countries.

Chapter 1 Food Additives and Why They Are Used

This chapter gives basic definition and explanation of what food additives are, describing in more detail the following categories: preservatives, antioxidants, emulsifiers, stabilisers, colours, sweeteners, flavour enhancers and flavourings, giving explanations why flavourings are not additives and definitions of other additives which do not belong to any of the above categories.

This chapter also explains the process of evaluation of the safety of food additive applications; it opens up a question of intolerance to food additives, with given examples. The last part of this chapter refers to 'clean labels' with critical comments on substances that are not additives, but have a technological function of additives and thus avoid the need to be labelled as additives. The avoidance of the use of E numbers opens up a vast area of insecurity because of 'surrogate additives', their possible negative impact on health, but also misleading the consumers.

Chapter 2 Safety of Food Additives in Europe

The safety of food additives is the most important aspect of interest for the consumer. This chapter very clearly describes the legislation, institutions, methods of testing the additives before they are placed on the market, and finally the safety of the substances that are intentionally added to food for a technological purpose. This chapter is essential for sceptics and critics of the use of additives in food products. If there is only a shred of reality in reasoning, the animosity and fear towards food additives will be rejected, and instead rational evaluation will be accepted. The subchapters refer to European legislation and safety assessment process, legislation through history, the role of the EFSA, general criteria for the use of food additives, the origin of E numbers, safety testing of additives before they are placed on the market (toxicity evaluation, absorption, distribution throughout the body, metabolism and excretion, acute or subacute toxicity, reproductive and embryotoxicity, chronic or carcinotoxicity, genotoxicity and other tests), outcomes of these toxicity tests, relevance of the effects observed in animals for human risk assessment, risk assessment of food additives, acceptable daily intake (ADI), comparison of daily intake of additives with ADI, exceeding the ADI, and finally re-evaluation of permitted additives. The re-evaluation is still in progress and at the moment the results are showing that the ADI for some additives has been changed, reduced or even removed from the list of permitted additives.

The evaluation of safety of additives is one of the most important public health concerns for the consumers of the European Union. The decision about placing new additives on the market is divided between the risk evaluation by EFSA and the final approval and risk management by the EU through its Member States. Systematic re-evaluation of additives that have been on the list of permitted additives is a prerequisite for maintaining trust in the safety of food that is being sold by using better analytical techniques and risk assessment procedures.

Chapter 3 The Development of Food Additive Legislation in Europe

Basically, this chapter gives an outline of the development of European Union from the beginnings in the 1950s, especially related to food additives. The importance of this chapter lies in the concise reminder about the significance of terms Regulation and Directive, and the role of the European Commission, Council, Parliament and Court of Justice. Procedures of gradual adoption of legislation are described including all the authorities involved. The chapter is highly informative for understanding the development of legislation related to food additives and the complexity of the approval and rejection system, and it answers the question why the European legislative procedure takes relatively long to bring the final decision. The same answer perhaps applies to why it is not easy to make changes of the existing regulations, which is very frustrating.

Chapter 4 European Legislative Framework Controlling the Use of Food Additives

This chapter deals with the EU Food Law from 2002, the postulates of the law with the emphasis on consumer health protection and on the position of food additives. It also describes the transformation of legislation from the first control of additives in 1989, the regulations resulting from it in the mid 1990s, to the new approach, the EU Regulation No 1333/2008 on food additives.

Apart from basic criteria for use of food additives, legislation determining purity parameters is also given. Purity criteria define parameters of safety and quality of additives. Thus, minimum amounts of pure substance are determined, as well as possible contamination during chemical synthesis or due to technological process. It is clearly seen from the purity criteria that there are no differences between the synthetically obtained additives and those from natural resources. However, anything that is subjected to a technological process cannot have leverage over natural source, or safer use.

Furthermore, a system of food categories in which certain additives are allowed to be used is described. Unfortunately, the definition of each food category as such is not given because a clear agreement about food categorisation does not exist in the EU. There are only draft versions which do not carry legal obligation but only a possibility of giving an explanation which food belongs to which category. This is perhaps the weakest link of the EU legislation regarding food. For this reason, the authors did not concentrate on that issue, but point out that there are subcategories within food categories, which complicates the whole issue.

This section again gives the definition of food additive, classification of additives according to technological necessity, their function in food and the definition of each category of additives according to their technological function in food.

Another definition that this chapter deals with is that of carry-over principle as well as of reverse carry-over principle. While the first principle is clear and unequivocal, the other is interpreted as an additive brought into a compound foodstuff even if it is not allowed to be used directly in this compound foodstuff. Moreover, such additive may have technological effect, and therefore, unlike the carried-over additive, which does not have a technological effect, it must be declared on the label. Since the interpretation of reverse carry-over principle has recently been discussed in each EU meeting, a better explanation will surely be found soon with guidelines determining when such additives are permitted and when not.

Further, key differences between a food additive and a processing aid used in the processing of food are given, and how to determine when a chemical substance is an additive and when a nutrient is explained. In addition, European approval procedure for additives, European list of approved additives, EU Food Additives Database, labelling rules, rules on allergen labelling and finally specific labelling for six food colours are given.

Chapter 5 Legislation for Food Additives Outside Europe

This chapter aims towards understanding the roots of legislation related to food additives, the European step ahead of the international guidelines of Codex Alimentarius and individual approaches to food additives of other countries, in comparison with the EU. The world as a global village needs to harmonise the legislation on food additives in such way that there are no barriers to food trade, with a clear emphasis on food safety and consumer awareness. Differences in the interpretation of carry-over principle, labelling allergens related to food additives and processing aids, nutrients treated as additives (depending on their quantity and role in food) and purity of additives are described. The achievements on the Codex level are also mentioned, as well as the specific characteristics of large exporters to the EU such as the USA, Canada, Japan, certain Far East and Middle East countries, Australia and New Zealand. A special part of the chapter deals with the legislation on additives in the USA, which had, unlike the legislation in other countries, a unique development. This is without a doubt a valuable collection of data about legislation and specificities that find their origin in the Codex source of guidelines about food additives and that indicate the necessity of harmonisation at a global level.

Chapter 6 E Numbers

The previous five chapters give a theoretical overview of the additives. The sixth chapter, comprising 185 pages, lists all food additives approved in the EU. The data were thoroughly collected and systematically presented. First, the E number of an additive is given, then its chemical name and synonyms. After that the source from which it is obtained is described, whether it is a product of chemical synthesis or from a natural source. Then follows the description of its technological role

in food, its advantages and limitations or negative effects at the allowed or increased consumption levels, and finally some products in which the additive is used.

Special mention goes to the data related to the advantages and limitations of use of each additive. Apart from technological role of additives, this information can be pivotal in the selection of an additive for use and understanding its primary and secondary function. They can also give answer to why some additives are not compatible with other additives and explain the errors that occur during technological process and during storage of the final product.

Regarding food colouring, limitation of the use of aluminium lake food colours is pointed out, and the limitations of the amounts used. Also, Commission Regulation (EU) No 380/2012 limits the conditions of use and the use levels for aluminium-containing food additives.

In order to obtain relevant data, it is necessary to read about the specificities of each of over 340 compounds, and this manual was written for that purpose.

Essential Guide to Food Additives, edited by Mike Saltmarsh, is intended for those interested in food additives, experts who work in food industry, students of cognate faculties and professors as a basis for their lectures, and I warmly recommend it as such.

Mr Sc Marijan Katalenić
Head of the Department for Food Safety
Croatian National Institute of Public Health
Zagreb, Croatia