



WORLD HEALTH ORGANIZATION  
ORGANISATION MONDIALE DE LA SANTÉ

[ ICS/FA/81. ]

Background paper No.2

Joint FAO/WHO Expert Committee on Food Additives  
Geneva, 23 March - 1 April 1981

*Food additives*

*History*

JECFA - Past, Present and Future

by

G. Vettorazzi\* & G. Kouthon\*\*



The Joint FAO/WHO Expert Committee on Food Additives (JECFA) was first convened in 1956 as a collaborative effort of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). This paper attempts to present the objectives, aims and terms of reference of this committee in the light of resolutions of the Council of the FAO and the World Health Assembly (the governing bodies of FAO and WHO, respectively) and recommendations made by the First, Second and Third Joint FAO/WHO Conferences on Food Additives, as well as the changes in work orientation and the achievements of the JECFA.

Background

The increase in the number of chemical substances used, or proposed for use, in or on food has imposed on public health departments and other governmental agencies the responsibility for deciding whether certain substances should be permitted in food processing. The need for attention to this matter was stressed several years ago by national and international organizations among which should be mentioned the European Committee of Chronic Toxicity (EUROTOX), the International Union Against Cancer (UICC), the National Academy of Sciences (NAS), the FAO and the WHO.

In 1953, the Sixth World Health Assembly (the organ that determines the policies of WHO) expressed the view that the increasing use of various chemical substances by the food industry had in the last few decades created a new public health problem that might usefully be investigated (1) (see also Annex I). The same problem was subsequently examined in 1954 by the WHO Executive Board (the organ that gives effect to the decisions and policies of the World Health Assembly (WHA)), when it was recommended that WHO, in cooperation with the FAO, collect and disseminate information on selected groups of chemical additives used in food, including testing techniques and relevant legislation (2) (see also Annex II).

The Council of the FAO, at its Twentieth Session in 1954, also recognized that the problem of food additives was of growing importance with respect both to motivation and food production and distribution, and requested the Director-General of the FAO to consider the kind of work which FAO could appropriately undertake on food additives, in association with WHO, taking into account any pertinent recommendations made by the Joint FAO/WHO Expert Committee on Nutrition (3) (see also Annex III).

At the fourth session of the above-mentioned committee, the desirability of a uniform approach to this problem was discussed. Attention was drawn to: a) the wide divergence in

\* WHO Joint Secretary to the Joint FAO/WHO Expert Committee on Food Additives

\*\* FAO Joint Secretary to the Joint FAO/WHO Expert Committee on Food Additives

The issue of this document does not constitute formal publication. It should not be reviewed, abstracted or quoted without the agreement of the World Health Organization. Authors alone are responsible for views expressed in signed articles.

Ce document ne constitue pas une publication. Il ne doit faire l'objet d'aucun compte rendu ou résumé ni d'aucune citation sans l'autorisation de l'Organisation Mondiale de la Santé. Les opinions exprimées dans les articles signés n'engagent que leurs auteurs.

the legislative measures already adopted or proposed in various countries; b) the conflicting evidence concerning individual food additives and the varying interpretations of such evidence; and c) the serious lack of data on many food additives both as regards their purity and the health hazards entailed by their use. It was felt that the groups concerned with the subject were not only limited in membership but that their activities in virtually identical fields led to duplication of effort, and might, without adequate coordination, result in conflicting recommendations. A conference of representatives of the groups working on this subject, together with delegates from interested Member States, was therefore proposed (4). This recommendation was endorsed by a resolution of the WHO Executive Board in 1955 (See Annex IV).

The first Joint FAO/WHO Conference on Food Additives met at Geneva, Switzerland, in 1955 and recommended the Directors-General of FAO and WHO to convene one or more expert committees that would be concerned with the technical and administrative aspects of the problem of chemical additives in food, namely: a) to formulate general principles governing the use of food additives, with special reference to their legal authorization, on the basis of considerations such as innocuity, purity, limits of tolerance, and the social, economic, psychological and technological reasons for their use, and taking into account work already done on the subject by national and international bodies; b) to recommend, as far as practicable, suitable uniform methods for the physical, chemical, biochemical, pharmacological, toxicological and biological examination of food additives and of any breakdown products formed during processing, for the pathological examination of experimental animals, and for the assessment and interpretation of the results (5). A resolution of the WHO Executive Board in 1956 noted the report of the First Joint FAO/WHO Conference on Food Additives, expressed its appreciation to the FAO and authorized publication of the report (see Annex V).

The recommendation to the Directors-General of FAO and WHO to convene one or more expert committees on the technical and administrative aspects of the problem of chemical food additives was implemented, and the first session of the Joint FAO/WHO Expert Committee on Food Additives was held in Rome in December 1956 (6).

Apart from approving publication of the annual reports of the JECFA and recommending approval of the budget for further committees, to date no further action has been taken by the WHA or the WHO Executive Board (see Annex VI). However, a review of the work of JECFA was entrusted to a Second Joint FAO/WHO Conference on Food Additives in 1963 and a Third Joint FAO/WHO Conference on Food Additives in 1973. It should be emphasized that the three Joint Conferences, which contributed significantly in guiding the work of JECFA, were all attended by representatives of national committees or similar inter-governmental or non-governmental groups concerned with the problems of chemicals in food, as required by the WHO Executive Board in 1955, when it established this mechanism to manage the problem of food additives.

The First Joint FAO/WHO Conference on Food Additives, which met in Geneva from 19 to 22 September 1955, considered the advantages that could be derived from international action in the field of food additives and discussed the possible means whereby FAO and WHO might jointly proceed. It formulated and recommended to the two Organizations a programme of work to meet urgent needs in the field of food additives, recommending, among other measures, the establishment of an expert committee as explained above.

The Second Joint FAO/WHO Conference on Food Additives was convened in Rome from 24 to 25 June 1963 a) to review the work of the JECFA, b) to consider the future programme on food additives, and c) to discuss the JECFA's relationship with, and contribution to, the newly established Joint FAO/WHO Programme on Food Standards. The conference noted that the programme on food additives had two functions: a) collection and dissemination of information concerning food additives and their control, and b) toxicological evaluation and the establishment of specifications for the identity and purity of food additives. The conference considered that the work of JECFA was of basic importance, and that positive lists of additives should emerge from it. Furthermore, the Conference felt that the JECFA, which is a purely technical committee of specialists acting in a personal capacity, should serve as the advisory body to the Codex Alimentarius Commission on all scientific matters concerning food additives.

The Third Joint FAO/WHO Conference on Food Additives and Contaminants met in Geneva from 22 to 26 October 1973 and was attended by delegates from 34 FAO and WHO Member States, as well as observers from 14 international organizations. It was convened, inter alia, to review the work carried out by JECFA during the period 1963-1973 and to discuss the future work of JECFA and to recommend priorities. After considerable discussion of the various suggestions of the delegates, the conference recommended, inter alia, that FAO and WHO continue to convene sessions of a single expert committee dealing with both food additives and contaminants and seek ways and means of holding more frequent sessions - food additives and food contaminants being dealt with, as far as possible, at separate sessions of the committee (8).

From the historical viewpoint, the work of the Joint FAO/WHO Conferences on Food Additives can be summarized as follows:

- a) the first conference was operative in establishing JECFA and outlining its policy from 1956 to 1963;
- b) the second conference was operative in establishing the relationship between the JECFA and the Joint FAO/WHO Food Standards Programme, by recommending that JECFA should be the advisory body to the Codex Alimentarius Commission, especially to the Codex Committee on Food Additives, thus initiating the present JECFA/CCFA system; and, finally,
- c) the third conference expanded the JECFA's terms of reference to include also the evaluation of food contaminants such as heavy metals, mycotoxins, etc.

#### The committee

As an expert committee sponsored jointly by FAO and WHO, JECFA is convened according to the regulations for expert advisory panels and committees of the two organizations. In general terms, the purposes and functions of expert committees include: a) reviewing the latest knowledge and expert information and making it available to the organizations, b) formulating technical recommendations, and c) making recommendations designed to initiate, stimulate and coordinate the research necessary to fulfil their terms of reference (9,10).

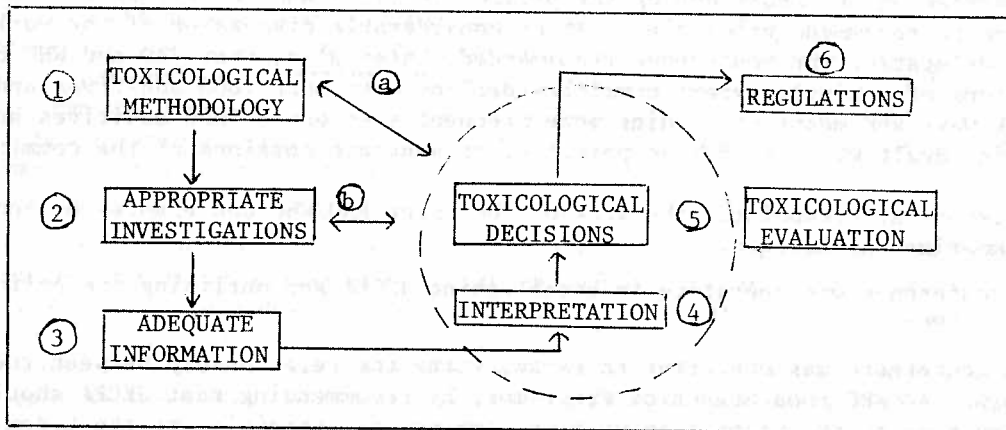
Specifically, the functions of the JECFA are to advise FAO, WHO and their Member States on the safety of food additives, intentional and unintentional, and it accomplishes this task by preparing reports and monographs, which are issued by the two organizations and made available to the responsible authorities of their Member States. The committee also serves in an advisory capacity to the Codex Alimentarius Commission, especially the to the Codex Committee on Food Additives (CCFA).

JECFA not only establishes the principles of toxicological evaluations but also evaluates available relevant information on individual food additives and contaminants through two working groups, one concerned with the toxicological appraisal of food additives, the other with the development of specifications for their identity and purity. In evaluating toxicity, the concept of an acceptable daily intake (ADI) is used to provide an indication of safety in the use of food additives, and to enable regulatory authorities to take adequate legislative measures for their control. The Committee sets out the major principles and results of the toxicological evaluations in its reports; in addition, it prepares monographs containing summaries of the biological evidence, the comments thereon and the evaluations. The specifications for identity and purity developed by JECFA have three main objectives: a) to identify the substance that has been biologically tested, b) to ensure that the substance is of the quality required for safe use in food, and c) to reflect and encourage good manufacturing practice. At one time JECFA prepared methods of analysis for food additives per se. However, since such methods are considered by the Codex Committee on Methods of Analysis and Sampling, JECFA no longer duplicates the work, except in a very few special cases when new or alternative analytical methodologies are recommended.

#### Achievements

During 25 years of activity, JECFA has produced about 60 publications (see Annex VII) and has recommended testing procedures and principles of interpretation of experimental

findings (11). From these activities a model assessment of chemical safety evaluation in the field of food additives has evolved. This model can be illustrated by the following diagram:



The diagram may be interpreted as follows: TOXICOLOGICAL METHODOLOGY (1) leads to the design of APPROPRIATE INVESTIGATIONS (2) which ought to supply ADEQUATE INFORMATION (3) which, after PROPER INTERPRETATION (4), assists in the formulation of TOXICOLOGICAL DECISIONS (5) which should provide the basis for REGULATIONS (6) on the safe use of intentional food additives. In addition, JECFA has significantly oriented research in this field by stressing the importance of specifications for identity and purity in the safety testing of food additives and by highlighting the need to select only data that are significant for assessment purposes.

Furthermore, the JECFA/CCFA system, recommended by the Second Joint FAO/WHO Conference on Food Additives in 1963, proved to be of value in providing the right framework for credibility and acceptance: JECFA, an international independent technical body serving as the advisory body to CCFA, a political, administrative body endeavouring to harmonize the legislation of Member States on food additives. The operational model developed by JECFA and CCFA is shown at page 5.

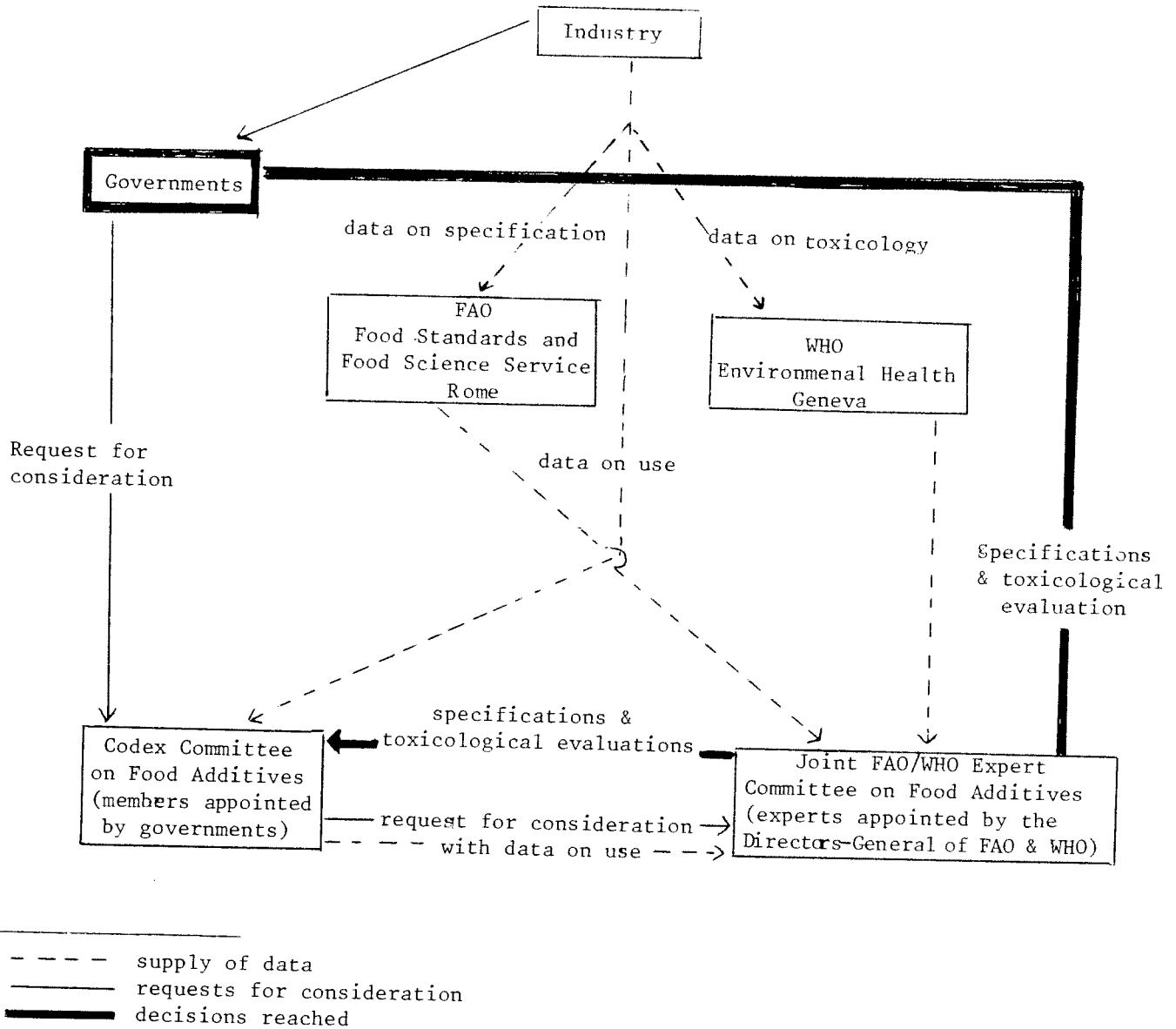
By expanding JECFA's terms of reference, the Third Joint FAO/WHO Conference on Food Additives and Contaminants brought complexity into the previous equilibrium. The safety assessment of food contaminants requires approaches different from those used for assessing intentional additives. However, JECFA adapted well to this need, and successfully assessed in 1972 the food contaminants mercury, lead and cadmium. In doing so, JECFA established a new concept of evaluation, the "provisional tolerable weekly intake" which can be looked upon as a departure from and, at the same time, a progress over the traditional ADI concept. Furthermore, more importance was given to technological and nutritional considerations in the safety assessment of food additives, as reactions among additives and food components (including other additives) may occur during food manufacture, storage and cooking; these chemical changes may be of toxicological and/or nutritional significance.

#### Events which influenced the work of JECFA

The 16th Session of JECFA was seeking advice when it recommended that FAO and WHO "should convene a third conference on food additives and contaminants to consider, at a policy-making level, the special problems of food contamination posed by environmental pollution, to set priorities among the contaminants to be considered, and to give guidance on future action by FAO and WHO". (12)

The ability of the Third Joint Conference to provide only partial guidance for future action can be explained by events outside the JECFA/CCFA system: a) the advent of environmental impact; b) the popularization of toxicology; and c) the managerial shifts and adjustments triggered off by innovative concepts ("structure-function" relationship).

Operational model developed by JECFA and CCFA



a. Environmental impact

A United Nations Conference on the Human Environment was held in Stockholm in 1972. The conference called for a combined approach to the effects of environmental factors in air, water, food, soil and the working environment. This unified approach has been reflected by the organizational changes which took place both nationally and internationally in order to implement worldwide the recommendations of the Stockholm Conference.

b. Popularization of toxicology

During the last 15 years the science of toxicology developed into many specialized branches which reflect the complexity inherent in the unified approach of the health assessment of environmental factors in air, water and food when these factors are considered in relation to the human target. The unified concept of "total body burden" became, thus, the underlying objective of any safety assessment. At the operational level, the multi-disciplinary approach required to attain the objective, created the need to integrate programme areas into comprehensive programmes. The trend towards integration, inevitably, demanded organizational changes both at the national and international level.

c. Innovative concepts

Some of the innovative concepts referred to here are described in a study by the Director-General of WHO on WHO's structure in the light of its functions (13) The study was performed at the request of the WHA (12) and presented to the WHO Executive Board. However, the underlying principles could be successfully applied to other situations.

These principles take into consideration the fast changes occurring in the modern world regarding the need for a balanced contribution of social, political and technical roles between peoples and their governments, between individual countries, and between countries and groups of countries in order to adjust structure-function relationships of existing managerial set-ups. It should, however, be noted that it is not so much the theoretical formulation that confers on these concepts their innovative character as their practical execution, since not enough experience has as yet accumulated from their implementation.

The innovative concepts not only account for the integration of ongoing programmes into more comprehensive programmes, but also for the formulation of close collaboration among the Member States themselves under the Organizations' directing, coordinating and technical cooperation functions. The end results could be considered to be the development of comprehensive collaborative programmes.

The future work of JECFA

From examination of the recommendations on work priorities made by Member States and of the previous reports of JECFA and the intergovernmental Codex Committee on Food Additives, it will be seen that there is a heavy workload ahead of JECFA. The various recommendations on future work still awaiting implementation, as they appear in the last reports of the Committee, are summarized below.

1. Classes of compounds to be evaluated:

- a. In view of the increasing amount of toxicological information and the large number of food additives, flavours, processing aids, packaging materials and contaminants to be evaluated or re-evaluated, meetings of the Joint FAO/WHO Expert Committee on Food Additives should continue to be held at least annually, until such time as a quicker procedure for data collection and evaluation has been developed.
- b. Enzymes are finding increasing use in food manufacture as processing aids. They should therefore be included in a broader evaluation of processing aids by a future Committee at an early date.
- c. The Committee should consider the food additives that are still outstanding from the priority list of the Codex Committee on Food Additives.
- d. The toxicological evaluation of modified food ingredients presents special problems in terms of their toxicity testing and evaluation. This requires special attention and should be considered at a future meeting.

2. Methodology

- a. The expeditious testing of food additives and contaminants classified as having a low priority for evaluation requires the development of in vivo short-term and in vitro tests to verify predictions of toxicity. The Committee recommended that these tests, the guidelines for their use, and the evaluation of the data they yield should be considered by a group of experts assembled by WHO.
- b. There is a need to develop new or improved guidelines for evaluating the long-term effects of food additives and contaminants on the fetus exposed in utero and on the neonate exposed via the mother's milk. In addition, guidelines should be developed to assure the safety of food additives in the diet of infants not being nursed. These subjects should form topics for future discussion.

- c. The need for testing the effects of exposure to food additives and contaminants in utero and on neonates during suckling was reaffirmed. However, in view of the complexity of the testing procedures, the Committee recommended that WHO should convene a meeting of experts to assess: (a) the degree of any increase in the sensitivity of toxicological testing afforded by exposure in utero and through lactation; and (b) the need to include such exposure in toxicological tests as a means of increasing public health protection. The experts should also propose guidelines for experimentation, covering: (a) the dosages used and the relative exposure of mother and fetus to the agent under study; (b) the possibility of combining this modified long-term test with reproduction studies; (c) the length of the studies required; and (d) the most appropriate species to use.
- d. In view of the rapid progress of the science of toxicology and the increasing refinement of evaluation procedures, the Committee felt strongly that the traditional concepts of setting ADIs, the application of safety factors, and the relationship of these safety factors to the observed toxicological manifestations in animal experiments should be reconsidered. It is therefore proposed that these complex problems be a topic of future discussion.
- e. A scientific group should consider the toxicological implications of recent developments in chemical carcinogenesis. In particular the implications of promoting factors and other modifiers of carcinogenic action should be considered. Furthermore, the recent recommendation of the International Agency for Research on Cancer - that evidence for carcinogenesis should be classified into "limited evidence" and "sufficient evidence" - should be considered in the context of food safety evaluation.
- f. There is a need for the Committee to evaluate models that can be used to extrapolate in vitro biochemical studies to the in vivo situation.
- g. Concern is often expressed about toxicological results obtained from tests using very high doses of food additives. Attention was drawn to this as early as the second report of the Committee. The Committee believes that, in general, such high-dosage studies are unnecessary. However, it does not believe that arbitrary guidelines to test levels can be recommended. Careful evaluation is the primary safeguard. It is recommended that this matter should be discussed at a future meeting.

### 3. Priorities

In order to establish priorities for the toxicological testing and evaluation of intentional and unintentional food additives, the Committee recommended that FAO and WHO should convene an interdisciplinary group of experts to establish an inventory of compounds that have not yet been fully evaluated and to classify them in terms of their potential hazard to health on the basis of toxicological knowledge and extent of use. The Committee could then employ the priority list as a means of selecting the most relevant compounds for future evaluation.

### 4. Chemical specifications

- a. Many food additives remain relatively poorly defined. This is particularly true of certain natural extracts. FAO is requested to ensure that as much information as possible is available on such substances so that more comprehensive specifications can be prepared.
- b. A number of specifications remain tentative for lack of data on certain chemical-purity criteria, microbiological criteria, or methods of analysis. Steps should be taken to obtain the data necessary to complete these specifications.
- c. It is recognized that microbiological criteria are needed for certain food additives, and that a consistent rationale is required in their application and inclusion in specifications. This need should be met as soon as possible, either through the use of consultants to prepare documentation for consideration by an early future meeting of the Committee or through a separate meeting of experts.

5. Miscellaneous

- a. In discussing colour additives, the Committee recognized that colours may also be added to animal feed and be deposited as such or as metabolites in edible animal products, e.g. egg yolk and chicken skin. It is clear that such colours must be considered as food additives requiring toxicological evaluation. The problems related to specifications and safety evaluation of such colours should be discussed at a future meeting.
- b. Adequate background information should be assembled and made available to the Expert Committee in order to arrive at proposals for tolerable weekly intakes for infants and young children for lead, cadmium, mercury, and PCBs. The need to establish tolerable intakes for infants and young children for other toxic trace elements and organo-halogen compounds found as contaminants in food should be examined.

References

1. WHO (1953)  
Resolution WHA6.16. Off. Rec. Wld Hlth Org. 48.22
2. WHO (1954)  
Resolution EB13.R47. Off. Rec. Wld Hlth Org. 52.20
3. FAO (1954)  
Resolution 4/20. Rep. Council FAO (20th Session) 1954
4. WHO/FAO (1955)  
WHO Technical Report Series No.97, FAO Nutrition Meetings Report Series No. 9.  
(Fourth Report of the Joint FAO/WHO Expert Committee on Nutrition)
5. WHO/FAO (1956)  
WHO Technical Report Series No. 107, FAO Nutrition Meetings Report Series No.11.  
(Report of the Joint FAO/WHO Conference on Food Additives)
6. WHO/FAO (1956)  
WHO Technical Report Series No. 129, FAO Nutrition Meeting Report Series No. 15.  
(General principles governing the use of food additives, First Report of the  
Joint FAO/WHO Expert Committee on Food Additives)
7. WHO/FAO (1963)  
WHO Technical Report Series No. 264, FAO Nutrition Meetings Report Series No.24.  
(Report of the Second Joint FAO/WHO Conference on Food Additives)
8. WHO/FAO (1973)  
Report of the Third Joint FAO/WHO Conference on Food Additives and Contaminants  
WHO/Food Additives/74.43 (unpublished document)
9. WHO (1980)  
Regulations for expert advisory panels and committees. In: Basic Documents  
30th Edition, pp 89-97. WHO Geneva
10. FAO (1980)  
Basic Texts of the Food and Agriculture Organization of the United Nations,  
Vols I & II. FAO, Rome
11. Vettorazzi, G. (1980)  
Handbook of International Food Regulatory Toxicology, Vol.1 - Evaluations.  
SP Medical & Scientific Books, New York.
12. WHO/FAO (1972)  
WHO Technical Report Series No. 505, FAO Nutrition Meetings Report Series No. 51  
(Evaluation of certain food additives and the contaminants mercury, lead and  
cadmium - Sixteenth Report of the Joint FAO/WHO Expert Committee on Food  
Additives)
13. WHO (1979)  
Study of WHO's structure in the light of its functions: WHO's processes, struc-  
tures and working relationships - Report of the Director-General of WHO, document  
EB65/18
14. WHO (1979)  
Handbook of Resolutions and Decisions of the WHA and EB, Vol.II, 3rd ed.  
(1973-1978)

Annex I

WHA6.16 The Sixth World Health Assembly

1. EXPRESSES THE VIEW that the increasing use of various chemical substances in the food industry has in the last few decades presented a new public-health problem and might be usefully investigated; and
2. REQUESTS the Executive Board to study this subject at its thirteenth session.

May 1953

Annex II

EB13.R47 The Executive Board

Believing that the subject of standardization of laboratory tests of foods, referred to the Board by the Sixth World Health Assembly (resolution WHA6.16), is one of great complexity and range,

1. CONSIDERS it advisable that the proposed study be limited for the time being to intentional chemical additives to foods;
2. NOTES that the Joint FAO/WHO Expert Committee on Nutrition had a related item on its agenda in the past, and that there is a possibility of the subject being again considered by this committee at a future session;
3. REQUESTS the Director-General to continue to collect information on this subject, including information on existing national legislation; and
4. RECOMMENDS that WHO, in cooperation with FAO, collect and disseminate information on selected groups of chemical additives, including laboratory techniques and relevant legislation.

January 1954

Annex III

Resolution No. 4/20

Additives to Food

The Council

Recognizing that the problem of food additives is of growing importance, with respect both to nutrition and food production and distribution;

Requests the Director-General to consider the kind of work which FAO can appropriately undertake in the field of additives to food, in association with WHO, taking into account any recommendations made by the Joint FAO/WHO Expert Committee on Nutrition at its Fourth Session and the implications with respect to the future program of work and budget.

Annex IV

EB15.R12     The Executive Board

.....

6.    REQUESTS the Director-General, in collaboration with the Director-General of the Food and Agriculture Organization, to convene, subject to availability of funds, a conference of representatives of national committees or similar groups working on food additives, together with representatives of inter-governmental or non-governmental groups concerned with the subject;

.....

January 1955

Annex V

EB17.R25     The Executive Board

1.    NOTES the report of the Joint FAO/WHO Conference on Food Additives;<sup>1</sup>
2.    EXPRESSES its appreciation to the Food and Agriculture Organization for its collaboration; and
3.    AUTHORIZES the publication of the report.

January 1956

---

<sup>1</sup> Wld Hlth Org. techn. Rep. Ser. 1956, 107

Annex VI

**REPORTS AND OTHER DOCUMENTS  
RESULTING FROM PREVIOUS MEETINGS  
OF THE JOINT FAO/WHO  
EXPERT COMMITTEE ON FOOD ADDITIVES**

Documents marked with an asterisk may be obtained on request from: Division of Environmental Health, World Health Organization, 1211 Geneva 27, Switzerland, or from Food Standards and Food Science Service, Food and Agriculture Organization of the United Nations, 00100 Rome, Italy.

1. *General principles governing the use of food additives* (First report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 15, 1957; WHO Technical Report Series, No. 129, 1957 (out of print).
2. *Procedures for the testing of intentional food additives to establish their safety for use* (Second report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 17, 1958; WHO Technical Report Series, No. 144, 1958 (out of print).
3. *Specifications for identity and purity of food additives (antimicrobial preservatives and antioxidants)* (Third report of the Expert Committee). These specifications were subsequently revised and published as *Specifications for identity and purity of food additives*, vol I. *Antimicrobial preservatives and antioxidants*, Rome, Food and Agriculture Organization of the United Nations, 1962 (out of print).
4. *Specifications for identity and purity of food additives (food colours)* (Fourth report of the Expert Committee). These specifications were subsequently revised and published as *Specifications for identity and purity of food additives*, vol. II. *Food colours*, Rome, Food and Agriculture Organization of the United Nations, 1963 (out of print).
5. *Evaluation of the carcinogenic hazards of food additives* (Fifth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 29, 1961; WHO Technical Report Series, No. 220, 1961 (out of print).
6. *Evaluation of the toxicity of a number of antimicrobials and antioxidants* (Sixth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 31, 1962; WHO Technical Report Series, No. 228, 1962.
7. *Specifications for the identity and purity of food additives and their toxicological evaluation: emulsifiers, stabilizers, bleaching and maturing agents* (Seventh report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 25, 1964; WHO Technical Report Series, No. 281, 1964 (out of print).
8. *Specifications for the identity and purity of food additives and their toxicological evaluation: food colours and some antimicrobials and antioxidants* (Eighth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 38, 1965; WHO Technical Report Series, No. 309, 1965 (out of print).
- \*9. *Specifications for identity and purity and toxicological evaluation of some antimicrobials and antioxidants*. FAO Nutrition Meetings Report Series, No. 38A, 1965; WHO/Food Add/24.65.

EB19.R16 (1957)

EB21.R5 (1958)

EB24.R13 (1959)

EB27.R4 (1961)

EB29.R22 (1962)

EB30.R15 (1962)

EB33.R20 (1964)

EB36.R3 (1965)

EB39.R7 (1967)

\*10. *Specifications for identity and purity and toxicological evaluation of food colours*, FAO Nutrition Meetings Report Series, No. 38B, 1966; WHO/Food Add/66.25.

11. *Specifications for the identity and purity of food additives and their toxicological evaluation: some antimicrobials, antioxidants, emulsifiers, stabilizers, flour-treatment agents, acids, and bases* (Ninth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 40, 1966; WHO Technical Report Series, No. 339, 1966.

12. *Specifications for the identity and purity of food additives and their toxicological evaluation: some emulsifiers and stabilizers and certain other substances* (Tenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 43, 1967; WHO Technical Report Series, No. 373, 1967.

\*13. *Toxicological evaluation of some antimicrobials, antioxidants, emulsifiers, stabilizers, flour-treatment agents, acids, and bases*. FAO Nutrition Meetings Report Series, No. 40A, B, C; WHO/Food Add/67.29.

14. *Specifications for the identity and purity of food additives and their toxicological evaluation: some flavouring substances and non-nutritive sweetening agents* (Eleventh report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 44, 1968; WHO Technical Report Series, No. 383, 1968.

\*15. *Toxicological evaluation of some flavouring substances and non-nutritive sweetening agents*. FAO Nutrition Meetings Report Series, No. 44A, 1968; WHO/Food Add/68.33.

\*16. *Specifications and criteria for identity and purity of some flavouring substances and non-nutritive sweetening agents*. FAO Nutrition Meetings Report Series, No. 44B, 1969; WHO/Food Add/69.31.

17. *Specifications for the identity and purity of food additives and their toxicological evaluation: some antibiotics* (Twelfth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 45, 1969; WHO Technical Report Series, No. 430, 1969.

\*18. *Specifications for the identity and purity of some antibiotics*. FAO Nutrition meetings Report Series, No. 43A, 1969; WHO/Food Add/69.34.

19. *Specifications for the identity and purity of food additives and their toxicological evaluation: some food colours, emulsifiers, stabilizers, anticaking agents, and certain other substances* (Thirteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 46, 1970; WHO Technical Report Series, No. 445, 1970.

\*20. *Toxicological evaluation of some food colours, emulsifiers, stabilizers, anticaking agents, and certain other substances*. FAO Nutrition Meetings Report Series, No. 46A; WHO/Food Add/70.36.

\*21. *Specifications for the identity and purity of some food colours, emulsifiers, stabilizers, anticaking agents, and certain other food additives*. FAO Nutrition Meetings Report Series, No. 46B; WHO/Food Add/70.37.

22. *Evaluation of food additives: specifications for the identity and purity of food additives and their toxicological evaluation: some extraction solvents and certain other substances; and a review of the technological efficacy of some antimicrobial agents* (Fourteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 48, 1971; WHO Technical Report Series, No. 462, 1971.

EB39.R7 (1967)

EB40.R3 (1967)

EB42.R12 (1968)

EB44.R3 (1969)

EB47.R25 (1971)

EB47.R.25 (1971)

relevant  
resolution

relevant  
resolution

- \*23. *Toxicological evaluation of some extraction solvents and certain other substances.* FAO Nutrition Meetings Report Series, No. 48A, 1971; WHO/Food Add/70.39.
- \*24. *Specifications for the identity and purity of some extraction solvents and certain other substances.* FAO Nutrition Meetings Report Series, No. 48B, 1971; WHO/Food Add/70.40.
- \*25. *A review of the technological efficacy of some antimicrobial agents.* FAO Nutrition Meetings Report Series, No. 48C, 1971; WHO/Food Add/70.41.
26. *Evaluation of food additives: some enzymes, modified starches, and certain other substances: toxicological evaluations and specifications and a review of the technological efficacy of some antioxidants* (Fifteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 50, 1972; WHO Technical Report Series, No. 488, 1972.
27. *Toxicological evaluation of some enzymes, modified starches, and certain other substances.* FAO Nutrition Meetings Report Series, No. 50A, 1972; WHO Food Additives Series, No. 1, 1972.
28. *Specifications for the identity and purity of some enzymes and certain other substances.* FAO Nutrition Meetings Report Series, No. 50B, 1972; WHO Food Additives Series, No. 2, 1972.
29. *A review of the technological efficacy of some antioxidants and synergists.* FAO Nutrition Meetings Report Series, No. 50C, 1972; WHO Food Additives Series, No. 3, 1972.
30. *Evaluation of certain food additives and the contaminants mercury, lead, and cadmium* (Sixteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 51, 1972; WHO Technical Report Series, No. 505, 1972, and corrigendum.
31. *Evaluation of mercury, lead, cadmium, and the food additives amaranth, diethylpyrocarbonate, and octyl gallate.* FAO Nutrition Meetings Report Series, No. 51A, 1972; WHO Food Additives Series, No. 4, 1972.
32. *Toxicological evaluation of certain food additives with a review of general principles and of specifications* (Seventeenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 53, 1974; WHO Technical Report Series, No. 539, 1974, and corrigendum.
33. *Toxicological evaluation of certain food additives including anticaking agents, antimicrobials, antioxidants, emulsifiers, and thickening agents.* FAO Nutrition Meetings Report Series, No. 53A; WHO Food Additives Series, No. 5, 1974.
34. *Evaluation of certain food additives* (Eighteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 54, 1974; WHO Technical Report Series, No. 557, 1974, and corrigendum.
35. *Toxicological evaluation of some food colours, enzymes, flavour enhancers, thickening agents, and certain other food additives.* FAO Nutrition Meetings Report Series, No. 54A, 1975; WHO Food Additives Series, No. 6, 1975.

EB49.R2(1972)

EB51.R2(1973)

EB53.R3(1974)

EB55.R2(1975)

36. *Specifications for the identity and purity of some food colours, flavour enhancers, thickening agents, and certain food additives.* FAO Nutrition Meetings Report Series, No. 54B, 1975; WHO Food Additives Series, No. 7, 1975.
37. *Evaluation of certain food additives: some food colours, thickening agents, smoke condensates, and certain other substances* (Nineteenth report of the Expert Committee). FAO Nutrition Meetings Report Series, No. 55, 1975; WHO Technical Report Series, No. 576, 1975.
38. *Toxicological evaluation of some food colours, thickening agents, and certain other substances.* FAO Nutrition Meetings Report Series, No. 55A. WHO Food Additives Series, No. 8, 1975.
39. *Specifications for the identity and purity of certain food additives.* FAO Nutrition Meetings Report Series, No. 55B, 1976; WHO Food Additives Series, No. 9, 1976.
40. *Evaluation of certain food additives* (Twentieth report of the Expert Committee). FAO Food and Nutrition Series, No. 1, 1976; WHO Technical Report Series, No. 599, 1976.
41. *Toxicological evaluation of certain food additives.* FAO Food and Nutrition Series, No. 1A, 1978; WHO Food Additives Series, No. 10, 1978.
42. *Specifications for the identity and purity of certain food additives.* FAO Food and Nutrition Series, No. 1B, 1977.
43. *Evaluation of certain food additives* (Twenty-first report of the Joint FAO/WHO Expert Committee on Food Additives). WHO Technical Report Series, No. 617, 1978.
44. *Summary of toxicological data of certain food additives.* WHO Food Additives Series No. 12, 1977.
45. *Specifications for identity and purity of some food additives, including antioxidants, food, colours, thickeners, and others.* FAO Nutrition Meeting Report Series, No. 57, 1977.
46. *Specifications for identity and purity of thickening agents, anticaking agents, antimicrobials, antioxidants and emulsifiers.* FAO Food and Nutrition Paper No. 4, 1978.
47. *Guide to specifications – General notices, general methods, identification tests, test solutions, and other reference materials.* FAO Food and Nutrition Paper No. 5, 1978.
48. *Evaluation of certain food additives* (Twenty-second report of the Joint FAO/WHO Expert Committee on Food Additives). WHO Technical Report Series, No. 631, 1978.
49. *Summary of toxicological data of certain food additives and contaminants.* WHO Food Additives Series No. 13, 1978.
50. *Specifications for the identity and purity of certain food additives.* FAO Food and Nutrition Paper No. 7, 1978.
51. *Evaluation of certain food additives* (Twenty-third report of the Joint FAO/WHO Expert Committee on Food Additives). WHO Technical Report Series, No. 648, 1980.

EB57.R3(1976)

EB59.R1(1977)

EB62(2) (1978)