A meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA) was held in Rome, Italy, from 16 to 25 June 2015. The purpose of the meeting was to evaluate certain food additives and contaminants.

Mrs I. Meyland, Denmark, served as Chairperson, and Dr A. Mattia, Center for Food Safety and Applied Nutrition, United States Food and Drug Administration, served as Vice-Chairperson.

Dr V. Fattori, Agriculture and Consumer Protection Department, Food and Agriculture Organization of the United Nations, and Dr A. Tritscher, Department of Food Safety and Zoonoses, World Health Organization, served as Joint Secretaries.

The present meeting was the eightieth in a series of similar meetings. The tasks before the Committee were (a) to elaborate principles governing the evaluation of food additives; (b) to undertake safety evaluations and/or dietary exposure assessments of certain food additives; (d) to undertake toxicological evaluations of certain contaminants; and (d) to review and prepare specifications for certain food additives.

The Committee evaluated the safety of six food additives and two groups of contaminants, conducted a dietary exposure assessment for one food additive and revised the specifications for nine other food additives.

The report of the meeting will be published in the WHO Technical Report Series. Its presentation will be similar to that of previous reports – namely, general considerations, comments on specific substances, and future work and recommendations. An annex will include detailed tables (similar to the tables in this report) summarizing the main conclusions of the Committee in terms of acceptable or tolerable daily intakes and other toxicological and safety recommendations. Information on the specifications for the identity and purity of certain food additives examined by the Committee will also be included.

The participants in the meeting are listed in Annex 1. Items of a general nature that the Committee would like to disseminate quickly are included in Annex 2. Future work and recommendations are listed in Annex 3.

Toxicological and dietary exposure monographs on certain of the substances that were considered will be published in WHO Food Additives Series No. 71 and addenda. New and
revised specifications for the identity and purity of the food additives considered will be published in FAO JECFA Monographs 17.

More information on the work of JECFA is available at:


and

http://www.who.int/foodsafety/areas_work/chemical-risks/jecfa/en/

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Toxicological information and information on specifications

Food additives considered for specifications only

<table>
<thead>
<tr>
<th>Food additive</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantame</td>
<td>R²</td>
</tr>
<tr>
<td>Aluminium silicate</td>
<td>W²</td>
</tr>
<tr>
<td>Annatto extract (solvent-extracted bixin)</td>
<td>R⁶</td>
</tr>
<tr>
<td>Annatto extract (solvent-extracted norbixin)</td>
<td>R⁶</td>
</tr>
<tr>
<td>Calcium aluminium silicate</td>
<td>W²</td>
</tr>
<tr>
<td>Calcium silicate</td>
<td>R²</td>
</tr>
<tr>
<td>Glycerol ester of gum rosin</td>
<td>W²</td>
</tr>
<tr>
<td>Silicon dioxide, amorphous</td>
<td>R, T⁶</td>
</tr>
<tr>
<td>Sodium aluminium silicate</td>
<td>R, T⁶</td>
</tr>
</tbody>
</table>

R: existing specifications revised; T: tentative specifications; W: tentative specifications withdrawn

a The requested information was received, and the method of assay was revised. The tentative status of the specifications was removed.

b The requested information was not received.

c The specifications were revised to reflect the modification of the method for residual solvents by headspace gas chromatography and to include sample and standard preparation information.

d The requested information was received, and the specifications were revised to include information on functional uses, pH, loss on drying, loss on ignition, impurities soluble in 0.5 M hydrochloric acid and the assay. The tentative status of the specifications was removed.

e Limited information was received. The specifications were revised to include information on pH, loss on drying, loss on ignition, impurities (lead and arsenic) soluble in 0.5 M hydrochloric acid and the assay for some forms of silicon dioxide. The tentative status of the specifications was maintained, and information was requested in order for the tentative specifications to be revised (see Annex 3).

f Limited information was received. The specifications were revised to include information on Chemical Abstracts Service number, chemical formula, pH, loss on drying, loss on ignition and limits on impurities (lead and arsenic) soluble in 0.5 M hydrochloric acid. The tentative status of the specifications was maintained, and information was requested in order for the tentative specifications to be revised (see Annex 3).

Food additives evaluated toxicologically and/or assessed for dietary exposure

<table>
<thead>
<tr>
<th>Food additive</th>
<th>Specifications</th>
<th>Acceptable daily intakes (ADIs) and other toxicological or safety recommendations and dietary exposure information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoates: dietary exposure assessment</td>
<td>NA</td>
<td>Based on the available data set, the Committee noted that there is consistency in the average typical range of concentration levels for benzoates reported to be used or analysed in non-alcoholic (“soft”) beverages (Codex General Standard for Food Additives [GSFA] food category 14.1). For example, typical reported concentration levels from industries ranged from 83 to 209 mg/L, and analytically quantified measurements ranged from 63 to 259 mg/L in GSFA food category 14.1.4; these levels are lower than national maximum limits (150–400 mg/L) or limits for GSFA food category 14.1.4 (600 mg/L). The Committee also noted that most of the reported estimates for mean and high percentile benzoate exposure were below the ADI of 0–5 mg/kg body weight (bw), expressed as benzoic acid, despite different methodologies and assumptions applied in the preparation of the exposure estimates.</td>
</tr>
<tr>
<td>Food additive</td>
<td>Specifications</td>
<td>Acceptable daily intakes (ADIs) and other toxicological or safety recommendations and dietary exposure information</td>
</tr>
<tr>
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</tr>
<tr>
<td>Lipase from <em>Fusarium heterosporum</em> expressed in <em>Ogataea polymorpha</em></td>
<td>N</td>
<td>None of the mean exposure estimates for consumers of non-alcoholic (“soft”) beverages exceeded the upper bound of the ADI: 0.3–4.1 mg/kg bw per day for toddlers and young children, 0.2–2.7 mg/kg bw per day for other children including adolescents, and 0.1–1.7 mg/kg bw per day for adults. However, the Committee noted that the 95th percentile exposures for the consumers-only group exceeded the upper bound of the ADI in some cases: up to 10.9 mg/kg bw per day for toddlers and young children and up to 7.0 mg/kg bw per day for other children including adolescents. Additionally, the Committee noted that in some countries, the overall dietary exposure to benzoates for toddlers, young children and adolescents also exceeds the upper bound of the ADI at the high percentiles. Reduction of those exposures exceeding the upper bound of the ADI would require consideration of dietary patterns for both beverage and non-beverage foods containing benzoates and typical/allowed benzoate use levels in those countries. No treatment-related adverse effects were seen at the highest dose tested (669 mg total organic solids [TOS]/kg bw per day) in a 13-week study of oral toxicity in rats. A comparison of the dietary exposure estimate of 0.5 mg TOS/kg bw per day (for a 60 kg individual) with the highest dose tested of 669 mg TOS/kg bw per day results in a margin of exposure (MOE) of at least 1300. The Committee established an ADI “not specified” for lipase from <em>F. heterosporum</em> expressed in <em>O. polymorpha</em> when used in the applications specified and in accordance with good manufacturing practice.</td>
</tr>
<tr>
<td>Magnesium stearate</td>
<td>N</td>
<td>The Committee estimated the potential total dietary exposure to magnesium stearate based on the proposed maximum use levels: 44 mg/kg bw per day for children and 83 mg/kg bw per day for adults, corresponding to 2 and 4 mg/kg bw per day, expressed as magnesium, respectively. These dietary exposures would contribute up to an additional 250 mg/day to the background exposure to magnesium from food of 180–480 mg/day. The Committee noted that the consumption of the food additive may lead to an additional dietary exposure to stearic and palmitic acids in the order of 5 g/day. An ADI &quot;not specified&quot; has previously been established for a number of magnesium salts used as food additives. The Committee concluded that there are no differences in the evaluation of the toxicity of magnesium stearate compared with other magnesium salts. The Committee confirmed the ADI “not specified” for magnesium salts of stearic and palmitic acids. However, the Committee was concerned that the use of magnesium salts in many food additives may result in combined exposure that could lead to a laxative effect. Therefore, the Committee reiterated its previous recommendation to undertake an exposure assessment for magnesium from use of food additives.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Food additive</th>
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<th>Acceptable daily intakes (ADIs) and other toxicological or safety recommendations and dietary exposure information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maltotetrahydrolase from <em>Pseudomonas stutzeri</em> expressed in <em>Bacillus licheniformis</em></td>
<td>N</td>
<td>No treatment-related adverse effects were seen at the highest dose tested (93 mg TOS/kg bw per day) in a 13-week study of oral toxicity in rats. A comparison of the dietary exposure estimate of 0.1 mg TOS/kg bw per day (for a 60 kg individual) with the highest dose tested of 93 mg TOS/kg bw per day results in an MOE of at least 900. <strong>The Committee established an ADI “not specified”</strong> for maltotetrahydrolase from <em>P. stutzeri</em> expressed in <em>B. licheniformis</em> when used in the applications specified and in accordance with good manufacturing practice.</td>
</tr>
<tr>
<td>Mixed β-glucanase, cellulase and xylanase from <em>Rasamsonia emersonii</em></td>
<td>N, T&lt;sup&gt;a&lt;/sup&gt;</td>
<td>No treatment-related adverse effects were seen at the highest dose tested (84.8 mg TOS/kg bw per day) in a 13-week study of oral toxicity in rats. A comparison of the dietary exposure estimate of 0.08 mg TOS/kg bw per day (for a 60 kg individual) with the highest dose tested of 84.8 mg TOS/kg bw per day results in an MOE of at least 1000. <strong>The Committee established an ADI “not specified”</strong> for the mixed β-glucanase, cellulase and xylanase enzyme preparation from <em>R. emersonii</em> when used in the applications specified and in accordance with good manufacturing practice.</td>
</tr>
<tr>
<td>Mixed β-glucanase and xylanase from <em>Disporotrichum dimorphosporum</em></td>
<td>N, T&lt;sup&gt;a&lt;/sup&gt;</td>
<td>No treatment-related adverse effects were seen at the highest dose tested (199 mg TOS/kg bw per day) in a 13-week study of oral toxicity in rats. A comparison of the dietary exposure estimate of 0.7 mg TOS/kg bw per day (for a 60 kg individual) with the highest dose tested of 199 mg TOS/kg bw per day gives an MOE of at least 280. <strong>The Committee established an ADI “not specified”</strong> for the mixed β-glucanase and xylanase enzyme preparation from <em>D. dimorphosporum</em> when used in the applications specified and in accordance with good manufacturing practice.</td>
</tr>
<tr>
<td>Polyvinyl alcohol (PVA) – polyethylene glycol (PEG) graft co-polymer</td>
<td>N</td>
<td>On the basis of the available studies, in which no treatment-related effects were seen at the highest doses tested, the Committee considered PVA-PEG graft co-polymer to be a substance of low oral toxicity in rats, rabbits and dogs. The bioavailability of PVA-PEG graft co-polymer in rats is negligible, and PVA-PEG graft co-polymer is unlikely to be genotoxic and is not associated with reproductive or developmental toxicity. Therefore, the Committee concluded that calculation of an MOE for PVA-PEG graft co-polymer would not be meaningful. Based on these data, the Committee would normally establish an ADI “not specified”. However, the Committee decided not to establish an ADI “not specified” for PVA-PEG graft co-polymer in view of the impurities present, some of which may also be impurities in other food additives. The Committee had concerns that establishing an ADI “not specified” could lead to additional uses beyond those considered at the current meeting and consequently could increase exposure to the impurities. The use of PVA-PEG graft co-polymer that complies with the proposed specifications could lead to a dietary</td>
</tr>
</tbody>
</table>

<sup>a</sup> MOE, Margin of Exposure.
<table>
<thead>
<tr>
<th>Food additive</th>
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</tr>
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<tr>
<td></td>
<td>Acceptable daily intakes (ADIs) and other toxicological or safety recommendations and dietary exposure information</td>
</tr>
<tr>
<td></td>
<td>exposure to ethylene glycol and diethylene glycol from both food supplements and pharmaceutical products up to 0.016 mg/kg bw per day for children (high consumers). This is 3% of the tolerable daily intake (TDI) of 0.5 mg/kg bw per day derived by the Scientific Committee on Food of the European Union, and therefore the exposure to ethylene glycol and diethylene glycol from the use of PVA-PEG graft co-polymer that complies with the specifications established at the current meeting is not of safety concern when the food additive is used in the applications specified. The use of PVA-PEG graft co-polymer that complies with the proposed specifications could lead to a dietary exposure to vinyl acetate from both food supplements and pharmaceutical products up to 0.0008 mg/kg bw per day for children. This dietary exposure estimate is at least 62 500 times lower than the dose levels at which increases in tumour incidence are observed in oral studies of long-term toxicity and carcinogenicity in rats and mice. Therefore, the dietary exposure to vinyl acetate from the use of PVA-PEG graft co-polymer that complies with the specifications established at the current meeting is not of safety concern when the food additive is used in the applications specified. The Committee concluded that the use of PVA-PEG graft co-polymer that complies with the specifications established at the current meeting is not of safety concern when the food additive is used as a glazing agent (aqueous film coating), stabilizer and binder for tablets in the preparation and formulation of food supplements and in accordance with good manufacturing practice.</td>
</tr>
</tbody>
</table>

N: new specifications; NA: not applicable (dietary exposure assessment only); T: tentative specifications

a ADI “not specified” is used to refer to a food substance of very low toxicity that, on the basis of the available data (chemical, biochemical, toxicological and other) and the total dietary exposure to the substance arising from its use at the levels necessary to achieve the desired effects and from its acceptable background levels in food, does not, in the opinion of the Committee, represent a hazard to health. For that reason, and for the reasons stated in the individual evaluations, the establishment of an ADI expressed in numerical form is not deemed necessary. An additive meeting this criterion must be used within the bounds of good manufacturing practice – i.e. it should be technologically efficacious and should be used at the lowest level necessary to achieve this effect, it should not conceal food of inferior quality or adulterated food, and it should not create a nutritional imbalance.

b Information is required in order for the tentative specifications to be revised (see Annex 3).
Contaminants

Non-dioxin-like polychlorinated biphenyls (NDL-PCBs)

PCBs are lipophilic compounds that accumulate in the tissues of living organisms and are taken up by humans primarily through the consumption of food, with foods of animal origin being the primary source of human exposure. There are 209 possible PCB congeners, of which 197 are NDL-PCBs. PCBs were reviewed at the thirty-fifth meeting of the Committee, and dioxin-like PCBs (DL-PCBs) were reviewed by the Committee at its fifty-seventh meeting. NDL-PCBs have not previously been specifically evaluated by the Committee.

PCBs exhibit different toxicological effects depending on the site of chlorine substitution on the phenyl rings. Congeners with two or more chlorine atoms in the ortho position are generally considered to be NDL-PCBs, with a different toxicological spectrum from DL-PCBs, which have a high affinity for the aryl hydrocarbon receptor and thus exhibit dioxin-like activity. International bodies have identified seven PCBs that can be used to characterize the presence of PCB contamination. Six of these are NDL-PCBs (PCB 28, PCB 52, PCB 101, PCB 138, PCB 153 and PCB 180), and one is a DL-PCB (PCB 118). The six NDL-PCBs are often called "indicator PCBs". For this evaluation, the Committee decided to focus on the six indicator PCBs, as there were sufficient data (toxicological, biomonitoring, occurrence and dietary exposure) available for review. Other NDL-PCBs were also considered where adequate data were available to make a risk characterization, as was found in the case of PCB 128.

National estimates of dietary exposure to the sum of the six indicator PCBs ranged, for mean exposure, from <1 to 82 ng/kg bw per day and, for high percentile exposure, from <1 to 163 ng/kg bw per day. International estimates based on Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme (GEMS/Food) consumption cluster diets are in the same range. For the sum of the six indicator PCBs, the contribution of each of the individual congeners differs between countries and population groups. However, for both dietary exposure and body burden estimates (which also take into consideration kinetics and half-lives), the main contributor is PCB 153, followed by PCB 180, then PCB 101 and PCB 28, with the lowest contribution from PCB 52.

The Committee concluded that none of the available studies on the six indicator PCBs (PCB 28, PCB 52, PCB 101, PCB 138, PCB 153 and PCB 180) and PCB 128 was suitable for derivation of health-based guidance values or for assessment of the relative potency of the NDL-PCBs compared with a reference compound. Therefore, a comparative approach using the minimal effect doses was developed in order to estimate MOEs to provide guidance on human health risk. Based on the available toxicological data on individual congeners, subtle changes in liver and thyroid histopathology were evident from the lowest doses tested of 2.8–7 µg/kg bw per day and were similar across the short-term and long-term studies of toxicity. The Committee decided to take the lower end of the range of test doses used for each congener at which these subtle changes occurred as a conservative point of departure for estimating MOEs, after conversion of external doses to internal doses (body burdens), based on reported NDL-PCB congener concentrations in adipose tissue.

Owing to the long half-lives and to eliminate interspecies differences in toxicokinetics, the Committee considered it appropriate to estimate body burdens rather than using external dose (dietary exposure) for the risk characterization. From human biomonitoring studies, the Committee derived equivalent body burdens based on the reported range of NDL-PCB concentrations in human milk for each congener. In addition, using a one-compartment kinetic dietary exposure model, body burdens were simulated for each congener using dietary exposure data from countries.

Comparison of the human body burden estimates (derived from human milk concentrations) with the body burden estimates from animal studies derived as points of departure for each congener resulted in MOEs for adults ranging from 4.5 to 5000.
MOEs for breastfed infants, which may have a body burden up to 2-fold higher than that of adults, would be approximately half of the adult values. The MOEs for children would be expected to be intermediate between those for adults and those for breastfed infants, owing to the initial contribution from breastfeeding and the subsequent lower dietary contribution compared with human milk.

Because the MOEs are based on minimal effect doses, they were considered to give some assurance that dietary exposures to NDL-PCBs are unlikely to be of health concern for adults and children, based on the available data. For breastfed infants, the MOEs would be expected to be lower. However, based on present knowledge, the benefits of breastfeeding are considered to outweigh the possible disadvantages that may be associated with the presence of NDL-PCBs in breast milk.

The Committee recognized that there are similarities in some of the reported effects for NDL-PCBs and therefore that risk estimates for combined exposure are desirable. The Committee concluded that this cannot be done on the basis of currently available data. The Committee also noted that the end-point selected for derivation of the MOEs was particularly conservative, as it was not of clear toxicological significance, it was a minimal change, and the lowest doses at which it was seen were used for the point of departure, combined with upper-bound estimates of body burden.

**Pyrrrolizidine alkaloids (PAs)**

PAs are toxins produced by an estimated 6000 plant species. More than 600 different PAs (including their N-oxides), mainly 1,2-unsaturated PAs, are known, and new PAs continue to be identified on a regular basis in both new and previously studied plant species. PAs have not been previously evaluated by the Committee, but they have been evaluated by a WHO Task Group on Environmental Health Criteria for Pyrrolizidine Alkaloids (coordinated by the International Programme on Chemical Safety [IPCS]) and by the International Agency for Research on Cancer (IARC).

A systematic review approach (see Annex 2) was used for gathering the data. The year 1988, when IPCS evaluated PAs, was taken as the cut-off point for selecting literature. As the European Food Safety Authority (EFSA) evaluated PAs in 2011, conclusions for non-critical studies that were included in the EFSA opinion were taken over in the current JECFA evaluation. Studies that were included in the EFSA opinion but were considered critical for the risk characterization were again critically assessed.

A systematic review protocol was developed, with six defined research questions that were used for the literature search in selected databases. More than 10,000 references were retrieved through title/abstract selection of the systematic review process. Because of time constraints, subsequent stages of the systematic review were not performed according to the protocol, and full text selection was done using the critical appraisal technique normally used in the preparation of JECFA monographs.

Sufficient information was reviewed to determine an approach for the evaluation. A preliminary report was prepared, which will be finalized in approximately 4–5 months.

Preliminary conclusions, which will need confirmation when all studies have been quality assessed and reviewed, include the following:

- Rats are the most sensitive species, and the liver is the most sensitive target organ.
- The genotoxic mode of action does not allow derivation of a health-based guidance value for chronic toxicity.
- Of the two long-term carcinogenicity studies, one on lasiocarpine and one on riddelliine, the Committee considered the study on riddelliine more appropriate for dose–response modelling.
- A lower limit on the benchmark dose for a 10% response (BMDL<sub>10</sub>) of 182 μg/kg bw per day for liver haemangiosarcoma in female rats treated with riddelliine was used as the point of departure in an MOE approach.
• Dietary exposures were estimated based on limited data for exposure to PAs through honey and tea consumption, for adults and children.
• The calculated MOEs for high adult consumers of tea and honey and for average tea consumption by children indicated a concern.
• Available data are not sufficient to identify relative potency factors for different 1,2-unsaturated PAs in order to evaluate the possible effects of combined exposure.
• Acute toxicity is of concern, and data, in particular human case reports, will be reviewed in detail for their potential use in the derivation of dose levels of concern.
Annex 1

Eightieth meeting of the Joint FAO/WHO Expert Committee on Food Additives

Rome, 16–25 June 2015

Members

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Dr A. Mattia, Office of Food Additive Safety, Center for Food Safety and Applied Nutrition, United States Food and Drug Administration, College Park, MD, USA (Vice-Chairperson)
Mrs I. Meyland, Birkerød, Denmark (Chairperson)
Dr U. Mueller, Food Standards Australia New Zealand, Barton, ACT, Australia (Joint Rapporteur)
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Dr A. Agudo, Unit of Nutrition and Cancer, Cancer Epidemiology Research Program, Institut Català d’Oncologia, L’Hospitalet de Llobregat, Spain (WHO Expert)
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Dr R. Cantrill, AOCS, Urbana, IL, USA (FAO Expert)
Mr P. Cressey, Risk and Response Group, ESR (Institute of Environmental Science and Research Ltd), Christchurch, New Zealand (FAO Expert)
Dr M. De Nijs, RIKILT Wageningen UR, Wageningen, the Netherlands (FAO Expert)
Dr E. Dessipri, General Chemical State Laboratory, Athens, Greece (FAO Expert)
Dr J.A. Edgar, CSIRO Food and Nutritional Sciences, North Ryde, NSW, Australia (FAO Expert)
Dr V. Fattori, Agriculture and Consumer Protection Department, Food and Agriculture Organization of the United Nations, Rome, Italy (FAO Joint Secretary)

Participants marked with an asterisk (*) did not attend the entire meeting.
Dr H. Häkansson, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden (WHO Expert)
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Annex 2

General considerations

An expanded version of this section will appear in the report of the eightieth meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA). It is reproduced here so that the information can be disseminated quickly.

Potential allergenicity of enzymes: change to the number of amino acids in segments used in allergen database searches

As there is no conclusive test that will predict a likely human immunoglobulin E (IgE) response to a genetically modified enzyme following oral exposure, an important first step involves undertaking a comparison of the amino acid sequence with those of established allergens. This amino acid sequence comparison is intended to detect both global similarities and short contiguous amino acid sequences that may represent linear IgE epitopes. For the short amino acid sequences, it is recognized that the 2001 FAO/WHO Consultation on Allergenicity of Foods Derived from Biotechnology suggested moving from eight to six amino acid segments in searches. However, experience gained with a large number of enzymes at JECFA indicates that searches involving six amino acid segments result in positive matches that are of no biological relevance. The Committee recommends that such searches should consider only eight amino acid sequences.

Application of systematic review to the work of the Committee

A systematic review is the process of collecting and evaluating literature using prespecified and standardized methods to answer specific research questions. The process is aimed at identifying, selecting, evaluating, interpreting and synthesizing all available research so that conclusions are drawn free of bias in a transparent and reproducible manner.

For the present meeting, the Committee undertook a systematic review of the literature on PAs (see above) to identify all information relevant to their biochemistry, toxicology and epidemiology. This approach was taken to gain experience in the application of systematic review methodology to the work of the Committee.

The Committee concluded that the approach, as a general concept, has merit. Elements of the systematic review process, such as defining clear questions to be addressed, searching and selecting the literature systematically, documenting search strategies and using predefined inclusion and exclusion criteria, can improve the transparency of the work of the Committee, as well as reproducibility of the assessment.

However, systematic review requires considerable resources and may not be the most efficient approach in evaluating the safety of a food chemical for which a comprehensive body of standardized toxicology tests is available. Rather, systematic review may be most useful when it is possible to address a food-related matter of public health concern with one or just a few sharply focused questions.

The Committee concluded that the application of a systematic review should be considered on a case-by-case basis and that the approach is not appropriate for routine use by the Committee at this time.
Revised guidance for WHO JECFA monographers

The Committee was provided with drafts of the two revised guidance documents for WHO monographers and reviewers evaluating 1) food additives (excluding flavouring agents) and 2) contaminants in food and feed. These guidance documents are intended primarily for WHO Experts (monographers) who prepare monographs for JECFA and for Members (reviewers) who have been assigned to peer review them and propose evaluations. The guidance will also be useful to manufacturers who submit dossiers to WHO and other parties interested in understanding the process followed in the evaluation of food additives or contaminants in food and feed by JECFA.

The Committee was asked to provide written comments to the Secretariat so that the documents can be finalized soon after the meeting.

The Committee requested that a separate guidance document on enzymes be prepared.

The final documents will be published on the WHO website at http://www.who.int/foodsafety/chem/jecfa/guidelines/en/.

Update on FAO and WHO databases related to the work of the Committee

The Secretariat has started a project to modernize the FAO JECFA databases (one for food additives, one for flavouring agents and one for residues of veterinary drugs), starting with the one on flavouring agents. While the major features and output will not differ significantly from the current version, the project aims to develop an online platform that allows the Secretariat to manage the process from receiving data for proposed new or revised specifications to adding/updating records to the database and to publishing the adopted specifications. The new database on flavouring agents will also allow for improved interconnectivity with other databases – i.e. the Codex inventories of adopted flavouring specifications and the WHO summary of JECFA evaluations.

The Committee was also updated on the latest developments on several WHO databases now available on a dedicated website. The searchable JECFA summary database provides concise information and direct links to the JECFA reports and monographs for each compound evaluated by JECFA, including contaminants, providing details on critical studies and end-points and estimated dietary exposures. FOSCOLLAB combines information from several databases (e.g. JECFA, GEMS/Food, Codex Alimentarius Commission) and provides the key information from each in one overview page (dashboard). Such dashboards have been developed for contaminants and for pesticides; another dashboard for veterinary drugs is under development.

To further improve the data used for dietary exposure assessment, FAO and WHO initiated a project to collect national individual food consumption data, detailed by different age groups and consumers only. Summary statistics from (currently) 37 surveys (only those with a duration of 2 days or more) from 26 countries are published in the FAO/WHO Chronic Individual Food Consumption Database – Summary statistics (CIFOCOss).

1 http://www.who.int/foodsafety/databases/en/
2 http://apps.who.int/food-additives-contaminants-jecfa-database/search.aspx
3 https://extranet.who.int/sree/Reports?op=vs&path=/WHO_HQ_Reports/G7/PROD/EXT/chemical_overview&userid=G7_ro&password=inetsoft123
Annex 3

Future work and recommendations

General considerations

Update on the draft specifications monographs for 16 modified starches

Following the recommendation made by the seventy-ninth meeting of the Committee, the 16 specifications for modified starches have been separated into stand-alone documents without adding, deleting or modifying any information. Some of the resulting single draft specifications monographs are incomplete; in some cases, essential information is missing, in particular information that would normally be needed to serve the purpose of a specification to unambiguously characterize the additive. Therefore, a revision of at least some of these individual draft specifications monographs is required. As the next step, the Committee recommended that the data and information necessary to complete and revise the 16 individual draft specifications monographs be requested through a call for data. In addition to the missing information (highlighted in the individual draft specifications monographs currently posted on the JECFA website at http://www.fao.org/fileadmin/user_upload/agns/pdf/jecfa/2015_02_22_Modified_Starches.pdf), data relevant to the method of manufacture, detection methods, product characterization and levels of contaminants present (if any) should be requested as well.

HPLC method in the adopted specifications of cassia gum

The Committee recommended that the data to revise the high-performance liquid chromatography (HPLC) method for the determination of anthraquinones in cassia gum be requested through a call for data. Based on the information and data submitted, the Committee will consider revising the specifications as appropriate.

Application of systematic review to the work of the Committee

The Committee recommended that methodological standards for food-related systematic review and criteria for determining when a systematic review is appropriate should be developed. Guidance on incorporating elements of the systematic review process into the work of the Committee should also be developed for future consideration.

Revised guidance for WHO JECFA monographers

The draft guidance documents for WHO monographers and reviewers evaluating 1) food additives (excluding flavouring agents) and 2) contaminants in food and feed will be revised based on written comments provided to the Secretariat by the Committee after the meeting. A separate guidance document on enzymes will also be prepared.

Specific food additives

Magnesium stearate and other magnesium-containing food additives

Based on the present dietary exposure assessment, the Committee reiterated its earlier recommendation that total dietary exposure to magnesium from food additives and other sources in the diet should be assessed. This is important, as a large number of magnesium-containing food additives have been evaluated individually, but not collectively, in relation to their laxative effects.
**Mixed β-glucanase, cellulase and xylanase from Rasamsonia emersonii**

New tentative specifications were prepared, with a request for the following information:

- a method to determine the identity for β-glucanase, including data from a minimum of five batches using the method described;
- a method to determine the identity for cellulase, including data from a minimum of five batches using the method described;
- a non-proprietary method to determine the identity and activity for xylanase that can be used by control laboratories, and data from a minimum of five batches using the method described.

The above-requested information should be submitted by December 2016 in order for the tentative specifications to be revised; failure to provide this information may lead to a withdrawal of the specifications, with a possible impact on the ADI.

**Mixed β-glucanase and xylanase from Disporotrichum dimorphosporum**

New tentative specifications were prepared, with a request for the following information:

- a method to determine the identity for β-glucanase, including data from a minimum of five batches using the method described;
- a non-proprietary method to determine the identity and activity for xylanase that can be used by control laboratories, and data from a minimum of five batches using the method described.

The above-requested information should be submitted by December 2016 in order for the tentative specifications to be revised; failure to provide this information may lead to a withdrawal of the specifications, with a possible impact on the ADI.

**Ethylene glycol and diethylene glycol impurities in food additives**

The Committee noted that ethylene glycol and diethylene glycol, which are impurities in PVA-PEG graft co-polymer, may also be present as impurities in other food additives, such as polyethylene glycols and polysorbates, and the total exposure to these compounds from food additives may be higher than from PVA-PEG graft co-polymer alone. Currently, only the specifications monograph for polyethylene glycols contains maximum limits for ethylene glycol and diethylene glycol (2500 mg/kg, singly or in combination). The Committee recommended setting and/or revising maximum limits for ethylene glycol and diethylene glycol that may occur as impurities in food additives at a future meeting.

**Silicon dioxide, amorphous**

The tentative status of the specifications was maintained, and the following information was requested:

- raw materials used and methods of manufacture for different forms of silicon dioxide (pyrogenic silica, precipitated silica, hydrated silica, silica aerogel and colloidal silica);
- identification methods allowing the differentiation between the above forms of silicon dioxide;
- functional uses of different forms, and information on the types of products in which it is used and the use levels in these products;
- data on solubility using the procedure documented in Volume 4 (Analytical methods) of the *Compendium of Food Additive Specifications*;
- data on the impurities soluble in 0.5 M hydrochloric acid for all forms of silicon dioxide used as food additives, from a minimum of five batches. If a different extraction and
determination method is used, data should be provided along with details of the method and quality control (QC) data;

• suitability of the analytical method for the determination of aluminium, silicon and sodium using the proposed “Method of assay” along with data from a minimum of five batches. If a different method is used, data should be provided along with details of the method and QC data;

• in addition to the above information, data on pH, loss on drying and loss on ignition for hydrated silica, silica aerogel and colloidal silica.

The tentative specifications will be withdrawn unless the requested information is provided by December 2016.

**Sodium aluminium silicate**

The tentative status of the specifications was maintained, and the following information was requested:

• functional uses other than anticaking agent, if any, and information on the types of products in which it is used and the use levels in these products;

• data on solubility using the procedure documented in Volume 4 (Analytical methods) of the *Compendium of Food Additive Specifications*;

• data on the impurities soluble in 0.5 M hydrochloric acid, from a minimum of five batches. If a different extraction and determination method is used, data should be provided along with details of the method and QC data;

• suitability of the analytical method for the determination of aluminium, silicon and sodium using the proposed “Method of assay”, along with data, from a minimum of five batches, using the proposed method. If a different method is used, data should be provided along with details of the method and QC data.

The tentative specifications will be withdrawn unless the requested information is provided by December 2016.