

EVALUATION OF CERTAIN FOOD ADDITIVES AND CONTAMINANTS

Seventy-third report of the
Joint FAO/WHO Expert Committee on
Food Additives



Food and Agriculture
Organization of the
United Nations



World Health
Organization



World Health
Organization

EVALUATION OF CERTAIN FOOD ADDITIVES AND CONTAMINANTS

Seventy-third report of the
Joint FAO/WHO Expert Committee on
Food Additives



Food and Agriculture
Organization of the
United Nations



World Health
Organization



WHO Library Cataloguing-in-Publication Data:

Evaluation of certain food additives and contaminants: seventy-third report of the Joint FAO/WHO Expert Committee on Food Additives.

(WHO technical report series ; no. 960)

1.Food additives - analysis. 2.Food additives - toxicity. 3.Flavoring agents - analysis. 4.Flavoring agents - toxicity. 5.Diet - adverse effects. 6.Risk assessment. I.World Health Organization. II.Food and Agriculture Organization of the United Nations. III.Joint FAO/WHO Expert Committee on Food Additives. Meeting (73rd: 2010, Geneva, Switzerland). IV.Series.

ISBN 978 92 4 120960 1

(NLM classification: WA 712)

ISSN 0512-3054

© World Health Organization 2011

All rights reserved. Publications of the World Health Organization can be obtained from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; e-mail: bookorders@who.int). Requests for permission to reproduce or translate WHO publications—whether for sale or for non-commercial distribution—should be addressed to WHO Press at the above address (fax: +41 22 791 4806; e-mail: permissions@who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

This publication contains the collective views of an international group of experts and does not necessarily represent the decisions or the stated policy of the World Health Organization.

Typeset in India

Printed in India

Contents

1. Introduction	1
1.1 Declarations of interests	1
2. General considerations	3
2.1 Modification of the agenda	3
2.2 Report from the Forty-second Session of the Codex Committee on Food Additives (CCFA) and the Fourth Session of the Codex Committee on Contaminants in Foods (CCCF)	4
2.3 Principles governing the toxicological evaluation of compounds on the agenda	5
2.4 Food additive specifications	5
2.4.1 HPLC methods for subsidiary dyes and isomers in food colours	5
2.4.2 Withdrawal of specifications	5
2.4.2.1 Annatto extract (oil-processed bixin)	5
2.5 Update on the activities of GEMS/Food	5
2.6 Possible improvements in dietary exposure assessment as a consequence of increased data submissions	7
2.7 Further consideration of combined intake of flavouring agents	7
3. Specific food additives (other than flavouring agents)	9
3.1 Revision of specifications	9
3.1.1 Activated carbon	9
3.1.2 Cassia gum	9
3.1.3 Indigotine	9
3.1.4 Steviol glycosides	10
3.1.5 Sucrose esters of fatty acids	10
3.1.6 Sucrose monoesters of lauric, palmitic or stearic acid	10
3.1.7 Titanium dioxide	11
4. Flavouring agents	13
4.1 Flavouring agents evaluated by the Procedure for the Safety Evaluation of Flavouring Agents	13
4.1.1 Alicyclic ketones, secondary alcohols and related esters: additional compounds	16
4.1.2 Alicyclic primary alcohols, aldehydes, acids and related esters: additional compounds	25
4.1.3 Aliphatic acyclic and alicyclic α -diketones and related α -hydroxyketones: additional compounds	35
4.1.4 Aliphatic acyclic and alicyclic terpenoid tertiary alcohols and structurally related substances: additional compounds	43
4.1.5 Aliphatic and aromatic amines and amides: additional compounds	49
4.1.6 Aliphatic lactones: additional compounds	58

4.1.7	Aliphatic primary alcohols, aldehydes, carboxylic acids, acetals and esters containing additional oxygenated functional groups: additional compounds	71
4.1.8	Aliphatic secondary alcohols, ketones and related esters and acetals: additional compounds	92
4.1.9	Aromatic substituted secondary alcohols, ketones and related esters: additional compounds	101
4.1.10	Benzyl derivatives: additional compounds	108
4.1.11	Phenol and phenol derivatives: additional compounds	114
4.1.12	Simple aliphatic and aromatic sulfides and thiols: additional compounds	124
4.2	Specifications of identity and purity of flavouring agents	147
4.2.1	New specifications	147
4.2.2	Revision of specifications	148
4.2.2.1	4-Carvomenthol (No. 439)	148
4.2.2.2	5,6,7,8-Tetrahydroquinoxaline (No. 952)	148
5.	Contaminants	149
5.1	Cadmium	149
5.2	Lead	162
	Acknowledgements	179
	References	181
Annex 1	Reports and other documents resulting from previous meetings of the Joint FAO/WHO Expert Committee on Food Additives	185
Annex 2	Tolerable intakes, other toxicological information and information on specifications	201
Annex 3	Further information required or desired	213
Annex 4	Summary of the safety evaluation of the secondary components for flavouring agents with minimum assay values of less than 95%	215
Annex 5	Food categories and standard portion sizes to be used in the additional method for making estimates of dietary exposure to flavouring agents	223

Seventy-third meeting of the Joint FAO/WHO Expert Committee on Food Additives

Geneva, 8–17 June 2010

Members

- Dr M. Bolger, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, United States of America (USA)
- Dr M. DiNovi, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, USA
- Dr Y. Kawamura, Division of Food Additives, National Institute of Health Sciences, Tokyo, Japan
- Dr J.C. Larsen, National Food Institute, Technical University of Denmark, Søborg, Denmark
- Dr A. Mattia, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, USA (*Chairperson*)
- Mrs I. Meyland, National Food Institute, Technical University of Denmark, Søborg, Denmark (*Vice-Chairperson*)
- Professor A. Renwick, Emeritus Professor, School of Medicine, University of Southampton, Ulverston, England (*Joint Rapporteur*)
- Dr J. Schlatter, Nutritional and Toxicological Risks Section, Federal Office of Public Health, Zurich, Switzerland
- Dr M. Veerabhadra Rao, Department of the President's Affairs, Al Ain, United Arab Emirates
- Professor R. Walker, Ash, Aldershot, Hantfordshire, England
- Mrs H. Wallin, National Food Safety Authority (Evira), Helsinki, Finland (*Joint Rapporteur*)

Secretariat

- Dr P.J. Abbott, Biosearch Consulting, Yarralumla, Canberra, Australia (*WHO Temporary Adviser*)
- Dr A. Agudo, Catalan Institute of Oncology, L'Hospitalet de Llobregat, Spain (*WHO Temporary Adviser*)
- Dr D.C. Bellinger, Harvard Medical School Children's Hospital, Boston, MA, USA (*WHO Temporary Adviser*)

- Dr D. Benford, Food Standards Agency, London, England (*WHO Temporary Adviser*)
- Dr A. Bruno, Joint FAO/WHO Food Standards Programme, Food and Agriculture Organization of the United Nations, Rome, Italy (*FAO Codex Secretariat*)
- Dr C. Carrington, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, USA (*WHO Temporary Adviser*)
- Mrs R. Charrondiere, Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations, Rome, Italy (*FAO Staff Member*)
- Dr J. Chen, Chairman of the Codex Committee on Food Additives, Chinese Centers for Disease Control and Prevention, Beijing, China (*WHO Temporary Adviser*)
- Ms S.K. Egan, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, USA (*WHO Temporary Adviser*)
- Dr D. Folmer, Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, MD, USA (*FAO Expert*)
- Dr S.M.F. Jeurissen, Centre for Substances and Integrated Risk Assessment, National Institute for Public Health and the Environment, Bilthoven, Netherlands (*WHO Temporary Adviser*)
- Dr F. Kayama, School of Medicine, Jichi Medical University, Tochigi, Japan (*WHO Temporary Adviser*)
- Professor S.M. Mahungu, Department of Dairy, Food Science and Technology, Egerton University, Egerton, Kenya (*FAO Expert*)
- Dr U.W. Mueller, Food Standards Australia New Zealand, Canberra, Australia (*WHO Temporary Adviser*)
- Dr B. Petersen, Exponent, Washington, DC, USA (*FAO Expert*)
- Professor S. Rath, Department of Analytical Chemistry, University of Campinas, Campinas, São Paulo, Brazil (*FAO Expert*)
- Ms M. Sheffer, Ottawa, Canada (*WHO Editor*)
- Professor I.G. Sipes, College of Medicine, University of Arizona, Tucson, AZ, USA (*WHO Temporary Adviser*)
- Dr A. Tritscher, Department of Food Safety and Zoonoses, World Health Organization, Geneva, Switzerland (*WHO Joint Secretary*)
- Dr T. Umemura, Biological Safety Research Center, National Institute of Health Sciences, Tokyo, Japan (*WHO Temporary Adviser*)
- Dr P. Verger, Department of Food Safety and Zoonoses, World Health Organization, Geneva, Switzerland (*WHO Staff Member*)
- Dr A. Wennberg, Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations, Rome, Italy (*FAO Joint Secretary*)
- Professor G.M. Williams, Department of Pathology, New York Medical College, Valhalla, NY, USA (*WHO Temporary Adviser*)

Monographs containing summaries of relevant data and toxicological evaluations are available from WHO under the title:

Safety evaluation of certain food additives and contaminants. WHO Food Additives Series, No. 64 in press.

Specifications are issued separately by FAO under the title:

Compendium of food additive specifications. FAO JECFA Monographs 10, 2010.

结束，完整报告链接和二维码如下：

yunbaogao.cn/report/index/report?reportId=5_28846

