

# codex alimentarius commission



FOOD AND AGRICULTURE  
ORGANIZATION  
OF THE UNITED NATIONS

WORLD  
HEALTH  
ORGANIZATION



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Agenda Item 10

CX/FAC 05/37/14  
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## JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON FOOD ADDITIVES AND CONTAMINANTS

Thirty-seventh Session

The Hague, the Netherlands, 25 – 29 April 2005

### INVENTORY OF PROCESSING AIDS (IPA) – UPDATED LIST

(Prepared by New Zealand)

#### BACKGROUND

1. The Codex Committee on Food Additives and Contaminants (CCFAC) decided at its 35<sup>th</sup> Session to set up a drafting group under the Chairmanship of Switzerland. The drafting group's mandate was to formulate a discussion paper to realise practical approaches and recommendations for addressing the issue of processing aids and carriers. This paper (which followed two previous discussion papers on processing aids and carriers in the context of the Codex General Standard for Food Additives (GSFA)) was disseminated to the 36<sup>th</sup> Session of the CCFAC for consideration of the options contained within.

2. The Committee recognised that the development of a positive list of processing aids was not a realistic approach to resolving the issue at the present time [due to a lack of resource which was elsewhere employed in the development of the GSFA, and because of the enormity of the task]<sup>1</sup>. Additionally, it had been decided previously at the 35<sup>th</sup> Session that including processing aids via a horizontal approach was not practicable given the inherent difficulties that would be involved in incorporating them into the GSFA.

3. However, the value of the Inventory of Processing Aids (IPA) itself, as a useful reference tool has been recognised, particularly by developing countries, and it was agreed to maintain the IPA for the time being. The Committee accepted the offer of the Delegation of New Zealand to prepare an updated version of the IPA for consideration at its next Session.

#### Development of the Inventory of Processing Aids

4. The IPA is a collection of information submitted by national authorities<sup>2</sup>. Its purpose is to provide a list of those substances whose sole function is of use as a processing aid.

5. At its 21<sup>st</sup> session in 1989, CCFAC agreed that the IPA be submitted to the CAC for adoption as a Codex advisory text. It was first published as a Codex advisory text in 1991 and included amendments agreed to at the CCFAC meetings in 1990 and 1991. The 1995 Codex publication (volume 1A, section 5.8) is the same as that published in 1991.

<sup>1</sup> ALINORM 04/27/12, para 87 and 88

<sup>2</sup> ALINORM 89/12A, Appendix VIII

6. On initiation of the list, CCFAC's primary purposes for the IPA were to:

- a) develop information on substances used as processing aids; and
- b) determine priorities for the review of processing aids by JECFA.

7. CCFAC agreed that the IPA was not intended to be a positive list of permitted processing aids to be used, for example, by reference in Codex commodity Standards. Further, CCFAC has not conducted its own risk assessment of the substances on the inventory.

8. Processing aids are listed alphabetically in one of 20 categories. Additional information is included on areas of utilisation, the level of residue, any interaction with food and the number of the JECFA meeting in which the substance was evaluated. CCFAC has been consistent in its decision that the IPA should be for substances that function solely as processing aids. The Codex Secretariat has endorsed this decision. However the IPA does currently contain substances that can also function as direct food additives (i.e. have a functional role in the final food).

9. Appendix A of the IPA is a comprehensive list of all substances that may function as a processing aid. The list includes substances:

- In the main body of the IPA that function solely as processing aids;
- Foods and food additives that could function as processing aids in limited circumstances.

10. Appendix B of the IPA lists microbial enzymes arranged by micro-organism from the main catalogue of enzymes in the IPA.

11. While CCFAC has considered amendments to the IPA at subsequent sessions, no amendments have been submitted to CAC for consideration.

### **The Updated IPA**

12. The proposed updated IPA (April 2005) as attached, updates the list with new processing aid uses as published in the CCFAC ALINORMs from the 32<sup>nd</sup> Session in 2000 up to and including the 36<sup>th</sup> Session in 2004. It does not as yet include substances considered and agreed to by CCFAC between 1989 and 2000. The updated entries can be identified by bold type and reference to a particular ALINORM. All of the current updates are sourced from CCFAC agenda items on action required following JECFA reports, including changes to ADIs; and items relating to endorsements of food additives and processing aids in Codex Standards as requested by Commodity Committees.

### **UPDATING ISSUES FOR FUTURE CONSIDERATION**

13. Subject to the agreement of the Committee, New Zealand intends to continue to provide an annual update of the IPA based on the decisions relating to processing aids at each successive CCFAC Session until the resolution of the treatment of processing aids is reached.

14. Changes to the IPA may result from decisions including those related to:

- JECFA reports including changes to ADIs;
- endorsements of processing aids in Codex Standards
- changes to the GSFA, including the removal of any entries that are processing aids and not food additive uses.

15. New Zealand has identified further issues that the Committee may consider in relation to the IPA and future updates including, whether an update to IPA prepared by New Zealand in 1999<sup>3</sup> could be used in a future update to the IPA. This update includes all substances in the original list submitted to the Commission in 1989 for adoption as an advisory list plus all additions to the inventory considered and agreed to by CCFAC up to and including its 31st session in 1999.

16. New Zealand proposes that the Committee considers requesting New Zealand and interested parties to consider further updates to the IPA, and in particular the value of incorporating the updated IPA prepared by New Zealand in 1999.

17. New Zealand recognises maintaining the IPA is an interim measure until the Committee is able to progress further Standards for processing aids.

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<sup>3</sup> An updated version of the IPA was drafted as an appendix to an initial discussion paper of processing aids by New Zealand for the 32<sup>nd</sup> Session in 2000. However, due to the length of the document and the timing of its completion the paper was not issued. An amended paper without the proposed updated IPA was presented at the 33<sup>rd</sup> Session in 2001 ALINORM 01/12 paras 59 to 61.

## INVENTORY OF PROCESSING AIDS<sup>4</sup>

CAC/MISC 3

### INTRODUCTION

This Inventory of Processing Aids was prepared by the Codex Committee on Food Additives and Contaminants. The objectives of the Committee are: (1) to develop information on substances used as processing aids and (2) to identify processing aids whose safety should be evaluated by the Joint FAO/WHO Expert Committee on Food Additives (JECFA). The Inventory of Processing Aids **is intended** to catalogue substances that are used in food solely as processing aids as defined by the Codex Alimentarius Commission (see Section 2 - Definitions). The Committee notes that the character of the Inventory is not intended to be complete or a "positive list" of permitted aids.

**This April 2005 version of the Inventory updates the IPA with processing aid decisions by the 32<sup>nd</sup> Session in 2000 through to the 36<sup>th</sup> Session in 2004. It does not as yet include any decisions or substances considered and agreed to by the Committee between 1989 and 2000. This update is a result of a decision by the Committee to maintain and update the IPA.<sup>5</sup>**

The Inventory is arranged in tabular format for presentation of information that will be necessary for the Committee to select substances for JECFA evaluation. The following information is provided:

- Category - the functional effect classification.
- Processing aid - the chemical name or description of the substance used as a processing aid.
- Area of utilization - the foods or food processing procedures in which the processing aid is utilized.
- Level of residues - the level of processing aid remaining in food after processing. The levels should be designated with respect to those: (1) directly measured by analysis or (2) estimated by other means. Values are in mg/kg and values at the detection limit of available analytical procedures are reported as "less than" (<).
- Interaction with food - describes the degree of chemical interaction with food components. Provides data on levels of interaction products in food.
- JECFA evaluation - if the processing aid substance has been reviewed or considered by a JECFA, then the number of the JECFA meeting is reported. The reference is to the latest JECFA evaluation, for either toxicological or specifications review. Additionally, the reference pertains to JECFA consideration of a substance and does not necessarily mean that JECFA reviewed the processing aid use(s) of this substance nor that JECFA assigned an ADI to the substance.

Appendix A to this inventory catalogues all substances that are used as processing aids. The substances are annotated according to the following system:

1. indicates a processing aid that clearly fits the definition of "processing aid" above.
2. indicates those materials that are both food additives (see definition below) and processing aids (i.e. the substance functions as a processing aid in one food but may have a different function in another food).
3. indicates those compounds that because of carry-over residues, would seem to usually be considered only as food additives (see section 5.2).
4. indicates those materials that might actually have simultaneous function as processing aids and functionality in the finished food.

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<sup>4</sup> The Inventory of Processing Aids was adopted by the Codex Alimentarius Commission at its 18<sup>th</sup> Session in 1989. It has been sent to all Member Nations and Associate Members of FAO and WHO as an advisory text, and it is for individual governments to decide what use they wish to make of the Inventory.

<sup>5</sup> **ALINORM 04/27/12 Report of the 36<sup>th</sup> Session April 2004 paragraph 88**

The Committee recognizes that any food additive, even if not included in the inventory or the appendix, may be used as a processing aid and is eligible for addition to the appendix. In some cases, however, the processing aid use of the food additive may require a separate JECFA evaluation.

Appendix B reproduces the Microbial Enzyme Preparation section of the inventory but arranges the enzymes by source organism rather than by function.

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
<b><u>Antifoam agents</u></b>				
Alkylene oxide adduct	Juice-making			
Coconut oil	Juice-making			
Dimethylpolysiloxane	Beer, fats & oils			
Ethylene oxide-propylene oxide copolymers	Juice-making			
Fatty acid methyl ester				
Fatty acid polyalkylene glycol ester (1-5 moles ethylene oxide or propylene oxide)				
Fatty alcohol-glycol ether	Juice-making			
Fatty alcohols (C8-C30)				
Formaldehyde	Sugar beet processing Yeast processing	< 0.05 < 0.05	None None	
Hydrogenated coconut oil	Confectionery	5-15		
Hydrophillic fatty acyl esters, linked to a neutral carrier	Juice-making			
Alpha-methylglycoside water	Juice-making			
Mixture of ethylene and propylene oxides, copolymers and esters, castor oil and polyethylene glycol ester	Juice-making			
Mixture of naturally occurring and synthetic fatty acyl derivatives, with added emulgators	Juice-making			
Non-ionogenic alkylene oxide adduct with emulgator	Juice-making			
Oxoalcohols C9-C30				
Polyalkylene oxide, in combination with special fatty alcohols	Juice-making			
Polyethoxylated alcohols, modified	Juice-making			
Polyglycol copolymer	Juice-making			
Polyoxyethylene esters of C8-C30 fatty acids				
Polyoxypropylene esters of C8-C30 fatty acids				
Polyoxyethylene esters of C9-C30 oxoalcohols				
Polyoxypropylene esters of C9-C30 oxoalcohols				
Methylglycoside coconut oil ester	Juice-making			
Mixtures of polyoxyethylene and polyoxypropylene esters of C8-C30 fatty acids				
Modified higher alcohol	Juice-making			
Mono- and diglycerides of fatty acids from feed fat (E471)	Juice-making			
Mono- and diglycerides of fatty acids from feed fat, esterified with acetic acid, lactic acid and citric acid (E472a, b, c)	Juice-making			
Polypropylene-polyethylene block polymer	Juice-making			

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Sorbitan-fatty acyl esters and polyoxyethylene-20-sorbitan fatty acyl esters	Juice-making			
Surface-active esters with neutral carriers	Juice-making			
Vegetable fatty acid esters	Juice-making			
Vegetable fatty acyl (hydrophillic)	Juice-making			
<b>Catalysts</b>				
Alloys of 2 or more listed metals	Hydrogenated food oils			
Alluminium				
Chromium	Hydrogenated food oils	< 0.1		
Copper	Hydrogenated food oils	< 0.1		26
Copper chromate				
Copper chromite				
Manganese	Hydrogenated food oils	< 0.4		
Magnesium oxide				
Molybdenum	Hydrogenated food oils	< 0.1		
Nickel	Sugar alcohols	< 1		
	Hardened oil mfg.	< 0.8		
	Hydrogenated food oils	0.2 to 1		
Palladium	Hydrogenated food oils	< 0.1		
Platinum	Hydrogenated food oils	< 0.1		
Potassium metal	Interesterified food oils	< 1		
Potassium methylate (methoxide)	Interesterified food oils	< 1		
Potassium ethylate (ethoxide)	Interesterified food oils	< 1		
Silver	Hydrogenated food oils	< 0.1		
Sodium amide	Interesterified food oils	< 1		
Sodium ethylene (sodium ethylate)	Interesterified food oils	< 1		
Sodium metal	Interesterified food oils	< 1		
Sodium methylate (methoxide)	Interesterified food oils	< 1		
Trifluoromethane sulfonic acid	Cocoa butter substitute	< 0.01	None	
Various metal oxides	Hydrogenated food oils	< 0.1		
Zirconium				
<b>Clarifying agents/filtration aids</b>				
Absorbent clays (bleaching, natural, or activated earths)	Starch hydrolysis Sugars Edible vegetable oil			
Active carbon	Sugars			
Albumin				
Asbestos				22
Bentonite	Starch hydrolysis			
Chitin/Chitosan				
Chloromethylated aminated styrene-divinylbenzene resin	Sugar processing	< 1	None	
Calcium oxide	Sugar			
Diatomaceous earth	Fruit juices Starch hydrolysis General use			

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Divinylbenzene-ethylvinylbenzene copolymer	Aqueous foods (excluding carbonated beverages)	0.00002 (extractives from copolymer)	None	
Fuller's earth	Starch hydrolysis			
Ion exchange resins (see <a href="#">Ion exchange resins</a> )				
Isinglass				
Kaolin				
Magnesium acetate				
Perlite	Starch hydrolysis			
Polymaleic acid and sodium polymaleate	Sugar processing	< 5	None	
Tannin (to be specified)				
Vegetable carbon (activated)	Starch hydrolysis			
Vegetable carbon (unactivated)				
<b><u>Contact freezing and cooling agents</u></b>				
Dichlorofluoromethane	Frozen food	100		
Freon (to be specified)				
Nitrogen				
<b><u>Desiccating agent/anticaking agents</u></b>				
Aluminum stearate				
Calcium phosphate				26
Calcium stearate				
Magnesium stearate				
Octadecylammonium acetate (in ammonium chloride)				
Potassium aluminum silicate				
Sodium calcium silicoaluminat				
<b><u>Detergents (wetting agents)</u></b>				
Diocetyl sodium sulfosuccinate	Fruit drinks	< 10		24
Methyl glucoside of coconut oil ester	Molasses	320		
Quaternary ammonium compounds				
Sodium lauryl sulphate	Food fats & oils	< 1		
Sodium xylene sulphonate	Food fats & oils	< 1		
<b><u>Enzyme immobilization agents and supports</u></b>				
Polyethylenimine				29
Glutaraldehyde				25
Glass	Starch hydrolysis			
Diatomaceous earth				
Ceramics	Starch hydrolysis			
Diethylaminoethyl cellulose				
Ion exchange resins				
<b><u>Enzyme preparations (including immobilized enzymes)</u></b>				
<b>Animal-Derived Preparations:</b>				
Alpha-amylase (hog or bovine pancreas)				
Catalase (bovine or horse liver)				15
Chymosin (Calf, kid, or lamb abomasum)				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Chymosin A from <i>Escherichia Coli</i> K-12 containing calf prochymosin A gene.	Milk clotting in cheese and other milk-derived products			37
Chymosin B produced from <i>Aspergillus niger</i> var. <i>awamori</i> containing calf prochymosin B gene.				
Chymosin B produced from <i>Kluyveromyces lactis</i> containing calf prochymosin B gene.				
Lipase (bovine stomach) (salivary glands or forestomach of calf, kid, or lamb) (hog or bovine pancreas)				15
Lysozyme (egg whites)	Cheese			
Pepsin (hog stomach)				15
Pepsin, avian (proventricum of poultry)				20
Phospholipase (pancreas)	Baking, starch processing			
Rennet (bovine, calf, goat, kid, or sheep, lamb stomach)				15
Typsin (porcine or bovine pancreas)				15
<b>Plant-derived preparations:</b>				
Bromelain ( <i>Ananas spp.</i> )				15
Chymopapain ( <i>Carica papaya</i> )				23
Ficin ( <i>Ficus spp.</i> )				15
Liposydase (soya)	Baking			
Malt carbohydrases (malted barley & barley) (alpha- and beta-amylase)	Beer Starch hydrolysis			15
Papain ( <i>Carica papaya</i> )				15
Alcohol dehydrogenase ( <i>Saccharomyces cerevisiae</i> )				15
Alpha amylase				
( <i>Aspergillus niger</i> )	Bakery products			
( <i>Aspergillus oryzae</i> )	Glucose syrups			25
( <i>Bacillus licheniformis</i> )	Fruit & vegetable			25
( <i>Bacillus licheniformis</i> containing a genetically engineered alpha-amylase gene from <i>B.licheniformis</i> )				<b>61</b>
<i>ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/27/12</i>				
( <i>Bacillus stearothermophilus</i> )	Beer			
( <i>Bacillus subtilis</i> )	Cereals			
( <i>Rhizopus delemar</i> )				
( <i>Rhizopus oryzae</i> )				15
Alpha galactosidase				
( <i>Aspergillus niger</i> )				15
( <i>Mortierella vinacea sp.</i> )				
( <i>Saccharomyces carlsbergensis</i> )				15
Arabinofuranosidase				
( <i>Aspergillus niger</i> )				15
Beta amylase				
( <i>Bacillus cereus</i> )				
( <i>Bacillus megaterium</i> )				
( <i>Bacillus subtilis</i> )				15

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Beta glucanase				
( <i>Aspergillus niger</i> )				15
( <i>Bacillus subtilis</i> )				15
( <i>Trichoderma harzianum</i> )				
Catalase				
( <i>Aspergillus niger</i> )	Egg products			25
( <i>Micrococcus lysodeicticus</i> )	Milk products			25
Cellobiase (betaglucosidase):				
( <i>Aspergillus niger</i> )				25
( <i>Trichoderma harzianum</i> )				20
( <i>Trichoderma reesei</i> )				
Cellulase				
( <i>Aspergillus niger</i> )	Juices fruit and			15
( <i>Aspergillus oryzae</i> )	vegetable,			15
( <i>Rhizopus delemar</i> )	processing, baking			
( <i>Rhizopus oryzae</i> )	beer, extractions			15
( <i>Sporotrichum</i>	(coffee, tea,			
<i>dimorphosporum</i> )	spices), starch			
( <i>Trichoderma reesei</i> )	processing			
( <i>Thielavia terrestris</i> )				
Dextranase				
( <i>Aspergillus sp.</i> )				
( <i>Bacillus subtilis</i> )				15
( <i>Klebsiella aerogenes</i> )				
( <i>Penicillium funiculosum</i> )				
( <i>Penicillium lilacinum</i> )				
Endo-beta glucanase				
( <i>Aspergillus niger</i> )	Beer			15
( <i>Aspergillus oryzae</i> )				15
( <i>Bacillus circulans</i> )				
( <i>Bacillus subtilis</i> )				15
( <i>Disporotrichum</i>				
<i>dimorphosphorum</i> )				
( <i>Penicillium emersonii</i> )				
( <i>Rhizopus delemar</i> )				
( <i>Rhizopus oryzae</i> )				15
( <i>Trichoderma reesei</i> )				
Esterase				
( <i>Mucor miehei</i> )				
( <i>Aspergillus niger, Trichoderma reesei</i> )				
Exo-alpha glucosidase				
( <i>Aspergillus niger</i> )				15
Exo-alpha glucosidase (immobilized)				
(same sources as above) no more than 10 mg/kg glutaraldehyde				
Glucoamylase or amyloglucosidase:				
( <i>Aspergillus amaurii</i> )	Starch hydrolysis			
( <i>Aspergillus awamori</i> )	Glucose syrups			22
( <i>Aspergillus niger</i> )				
( <i>Aspergillus oryzae</i> )				25
( <i>Rhizopus arrhizus</i> )				
( <i>Rhizopus delemar</i> )				
( <i>Rhizopus niveus</i> )				
( <i>Rhizopus oryzae</i> )				15
( <i>Trichoderma reesei</i> )				
Glucose isomerase:				
( <i>Actinoplanes missouriensis</i> )	Isomerized	None		28
( <i>Arthrobacter sp.</i> )	glucose syrups	detected		15
( <i>Bacillus coagulans</i> )				28
( <i>Streptomyces albus</i> )				28

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
( <i>Streptomyces olivaceus</i> )				28
( <i>Streptomyces olivochromogenes</i> )				28
( <i>Streptomyces rubiginosus</i> )				25
( <i>Streptomyces sp.</i> )				15
( <i>Streptomyces violaceoniger</i> )				28
Glucose isomerase (immobilized) (same sources as above) not more than 10 mg/kg glutaraldehyde				
Glucose oxidase				
( <i>Aspergillus niger</i> )	Egg powder, baking, Beverages, mayonnaise, fish and meat products, Canned foods, cheese			25
Hemicellulase				
( <i>Aspergillus niger</i> )	Juices, fruit and			15
( <i>Aspergillus oryzae</i> )	vegetable			15
( <i>Bacillus subtilis</i> )	processing, baking,			15
( <i>Rhizopus delemar</i> )	beer, extractions			
( <i>Rhizopus oryzae</i> )	(coffee, tea, spices)			15
( <i>Sporotrichum dimorphosporum</i> )				
( <i>Trichoderma reesei</i> )				
Inulinase				
( <i>Aspergillus niger</i> )				15
( <i>Kluyveromyces fragilis</i> )				
( <i>Sporotrichum dimorphosporum</i> )				
( <i>Streptomyces sp.</i> )				15
Invertase				
( <i>Aspergillus niger</i> )				15
( <i>Bacillus subtilis</i> )				15
( <i>Kluyveromyces fragilis</i> )				
( <i>Saccharomyces carlsbergensis</i> )				15
( <i>Saccharomyces cerevisiae</i> )				15,57
ref 57 <sup>th</sup> JECFA ADI not specified; 34 <sup>th</sup> CCFAC ALINORM 03/12				
( <i>Saccharomyces sp.</i> )				15
Isoamylase				
( <i>Bacillus cereus</i> )				
<b>Laccase</b>				
( <i>Myceliophthora thermophila</i> expressed in <i>Aspergillus oryzae</i> )				61
ref 61 <sup>st</sup> JECFA ADI not specified; 36 <sup>th</sup> CCFAC ALINORM 04/27/12				
Lactase (Betagalactosidase):				
( <i>Aspergillus niger</i> )	Milk products			15
( <i>Aspergillus oryzae</i> )	Infant formula			15
( <i>Kluyveromyces fragilis</i> )				
( <i>Kluyveromyces lactis</i> )				
( <i>Saccharomyces sp.</i> )				15
Lactoperoxidase				
Lipase				
( <i>Aspergillus flavus</i> )				
( <i>Aspergillus niger</i> )				
( <i>Aspergillus oryzae</i> )				15
( <i>Brevibacterium lineus</i> )				
( <i>Candida lipolytica</i> )				
( <i>Mucor javanicus</i> )				
( <i>Mucor miehei</i> )				
( <i>Mucor pusillus</i> )				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
( <i>Rhizopus arrhizus</i> )				
( <i>Rhizopus delemar</i> )				
( <i>Rhizopus nigrican</i> )				
( <i>Rhizopus niveus</i> )				
Malic acid decarboxylase				
( <i>Leuconostoc oenos</i> )				
Maltase or alpha-glucosidase				
( <i>Aspergillus niger</i> )				15
( <i>Aspergillus oryzae</i> )				15
( <i>Rhizopus oryzae</i> )				15
( <i>Trichoderma reesei</i> )				
Melibiose (alpha galactosidase):				
( <i>Mortierella vinacea sp.</i> )				
( <i>Saccharomyces carlsbergensis</i> )				15
<b>Mixed xylanase, beta-glucanase enzyme preparation</b>				
( <i>Humicola insolens</i> )				<b>61</b>
ref 61 <sup>st</sup> JECFA ADI not specified; 36 <sup>th</sup> CCFAC ALINORM 04/27/12				
Nitrate reductase				
( <i>Micrococcus violagabriella</i> )				
Pectinase				
( <i>Aspergillus awamora</i> )	Fruit & vegetable			
( <i>Aspergillus awamori</i> )	juices,			
( <i>Aspergillus foetidus</i> )	Cereal processing,			
( <i>Aspergillus niger</i> )	extractions (coffee,			15
( <i>Aspergillus oryzae</i> )	tea, spices)			15
( <i>Penicillium simplicissimum</i> )				
( <i>Rhizopus oryzae</i> )				15
( <i>Trichoderma reesei</i> )				
Pectin esterase				
( <i>Aspergillus niger</i> )				15
Pectinlyase				
( <i>Aspergillus niger</i> )				15
Polygalacturonase				
( <i>Aspergillus niger</i> )				15
Protease (including milk clotting enzymes):				
( <i>Aspergillus melleus</i> )	Bakery products			
( <i>Aspergillus niger</i> )	Cheese			
( <i>Aspergillus oryzae</i> )	Cheese			
( <i>Bacillus cereus</i> )	Cheese			25
( <i>Bacillus licheniformis</i> )	Cheese			28
( <i>Bacillus subtilis</i> )	Starch hydrolysis,			
( <i>Brevibacterium lineus</i> )	Glucose syrups,			15
( <i>Endothia parasitica</i> )	Maltose syrups			
( <i>Lactobacillus casei</i> )				28
( <i>Micrococcus caseolyticus</i> )				
( <i>Mucor miehei</i> )				
( <i>Mucor pusillus</i> )				28
( <i>Streptococcus cremoris</i> )				28
( <i>Streptococcus lactis</i> )				
Pullulanase				
( <i>Bacillus acidopullulyticus</i> )				
( <i>Bacillus subtilis</i> )				
( <i>Klebsiella aerogenes</i> )				25
Serine proteinase				
( <i>Streptomyces fradiae</i> )				28
( <i>Bacillus licheniformis</i> )				
Tannase				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) Xylanase				
( <i>Aspergillus niger</i> ) ( <i>Sporotrichum dimorphosporum</i> ) ( <i>Streptomyces sp.</i> ) ( <i>Thermomyces lanuginosus</i> expressed in <i>Fusarium venenatum</i> ) ref 61 <sup>st</sup> JECFA ADI not specified; 36 <sup>th</sup> CCFAC ALINORM 04/27/12	Baking, cereal processing, brewing, starch			61
Beta-xylosidase ( <i>Trichoderma reesei</i> )	processing, juice, wine Baking			
<b><u>Flocculating agents</u></b>				
Acrylate-acrylamide resin	Sugar	(10 in sugar liquor)		
Chitin/Chitosan				
Complexes of soluble aluminum salt and phosphoric acid	Drinking water			
Dimethylamine-epichlorohydrin copolymer	Sugar processing	< 5	None	
Fuller's earth (calcium analogue of sodium montmorillonite)				
Isinglass				
Dried and powdered blood plasma				
Modified acrylamide resin	Sugar, boiler water			
Polyacrylic acid	Sugar			
Polyacrylamide	Sugar (beet)			
Sodium polyacrylate	Sugar (beet)			
Trisodium diphosphate				
Trisodium orthophosphate				
<b><u>Ion exchange resins, membranes and molecular sieves</u></b>				
<b>Resins:</b>	Enzyme immob. Starch hydrolysis	< 1 (Calculated at Total Organic Carbon)		
Completely hydrolyzed copolymers of methyl acrylate and divinylbenzene				
Completely hydrolyzed terpolymers of methyl acrylate, divinylbenzene and acrylonitrile				
Cross-linked phenol-formaldehyde activated with one or both of the following: Triethylenetetramine Tetraethylenepentamine				
Cross-linked polystyrene, first chloromethylated then aminated with trimethylamine, dimethylamine, diethylenetriamine or dimethylethanolamine				
Diethylenetriamine, triethylenetetramine, tetraethylenepentamine cross-linked with epichlorohydrin				
Epichlorohydrin cross-linked with ammonia				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Epichlorohydrin cross-linked with ammonia and then quaternized with methyl chloride to contain not more than 18 percent strong base capacity by weight of total exchange capacity	Water used in food processing	None		
Methacrylic acid-divinylbenzene copolymer				
Methacrylic acid-divinylbenzene copolymer with RCOO active groups				
Methyl acrylate-divinylbenzene copolymer containing not less than 2 percent by weight of divinylbenzene, aminolyzed with dimethylaminopropylamine				
Methyl acrylate-divinylbenzene copolymer containing not less than 3.5 percent by weight of divinylbenzene, aminolyzed with dimethylaminopropylamine				
Methyl acrylate-divinylbenzenediethylene glycol divinyl ether terpolymer containing not less than 3.5 percent by weight of divinylbenzene and not more than 0.6 percent by weight of diethylene glycol divinyl ether, aminolyzed with dimethylaminopropylamine				
Methyl acrylate-divinylbenzene-diethylene glycol divinyl ether terpolymer containing not less than 7 percent by weight of divinylbenzene and not more than 2.3 percent by weight of diethylene glycol divinyl ether, aminolyzed with dimethylaminopropylamine and quaternized with methyl chloride	Sugar processing	0.015 (extractives from resin)	None	
Polystyrene-divinylbenzene reticulum with trimethylammonium groups	Sugar, distilled liquors	Migrants from resin < 1		
Reaction resin of formaldehyde, acetone and tetraethylenepentamine				
Styrene-divinylbenzene cross-linked copolymer, first chloromethylated then aminated with dimethylamine and oxidized with hydrogen peroxide whereby the resin contains not more than 15 percent by weight of vinyl N,N-dimethylbenzylamine-N-oxide and not more than 6.5 percent by weight of nitrogen				
Sulfite-modified cross-linked phenol-formaldehyde, with modification resulting in sulfonic acid groups on side chains				
Sulfonated anthracite coal meeting the requirements of American Society for Testing and Materials D388-38, Class I, Group 2				
Sulfonated copolymer of styrene and divinylbenzene				
Sulfonated terpolymers of styrene, divinylbenzene and acrylonitrile or methyl acrylate				
Sulfonated tetrapolymer of styrene,				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
divinylbenzene, acrylonitrile and methyl acrylate derived from a mixture of monomers containing not more than a total of 2 percent by weight of acrylonitrile and methyl acrylate				
<b>Counter ions for resins:</b>				
Aluminum				
Bicarbonate				
Calcium				
Carbonate				
Chloride				
Hydronium				
Hydroxyl				
Magnesium				
Potassium				
Sodium				
Strontium				
Sulfate				
<b>Membranes:</b>				
Polyethylene - polystyrene base modified by reaction with chloramethyl ether and subsequent amination with trimethylamine, diethylenetriamine or dimethylethanolamine				
Polymers and copolymers containing the following components: cellulosics (such as cellulose diacetate, cellulose triacetate, cellulose ethers, cellulose), Polysulfone-sulfonated polysulfone, Polyethersulfone-sulfonated polyethersulfone, Fluoropolymers (such as polyvinylidene fluoride, chlorotrifluoroethylene-vinylidene fluoride copolymer, polytetrafluoroethylene), Polysulfonamides, aliphatic/aromatic polyamide and copolyamides (such as polypiperazineamides, m-phenylenediamine trimesamide polymer), Polyesters (such as polyethyleneterephthalate), Polyolefins (such as polypropylene, polyethylene), Polyamide-imide polymers, Polyimides, Polyacrylonitriles, Polyvinylpyrrolidone, Polystyrene-sulfonated polystyrene, chitin/chitosan and derivatives, polyureas-polyurethanes, Polyethers, and Polyamines				
<b>Molecular Sieves:</b>				
Calcium aluminum silicate				18
Sodium aluminum silicate				17
<b><u>Lubricants, release and anti-stick agents, moulding aids</u></b>				
Bentonite	Confectionery			
Dimethylpolysiloxane				26
Kaolin	Confectionery			17
<b><u>Micro-organism control agents</u></b>				
Chlorine dioxide	Flour			7
Dimethyl dicarbonate	Wine	None		
Formaldehyde	Sugar			

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Hydrogen peroxide	Sugar, fruit and vegetable juice			24
Hypochlorite	Food oils			
Iodophors	Food oils			
Peracetic acid				
Quaternary ammonium compounds	Food oils			
Salts of sulfurous acid	Corn milling Starch hydrolysis	< 100		
Lactoperoxidase system (lactoperoxidase, glucose oxidase, thiocyanate salt)				
<b><u>Propellant and packaging gases</u></b>				
Air				
Argon				
Carbon dioxide				
Chloropentafluoroethane				
Combustion product gas [a variable mixture of gases produced by controlled combustion of butane, propane, or natural gas. The principal components are nitrogen and carbon dioxide, with lesser amounts of hydrogen, oxygen, carbon monoxide (not to exceed 4.5%), and traces of other inert gases]				
Dichlorodifluoromethane (F 12)				
Helium				
Hydrogen				
Nitrous oxide				28
Nitrogen				26
Octafluorocyclobutane				
Propane				23
Trichlorofluoromethane (F 11)				
<b><u>Solvents, extraction and processing</u></b>				
Acetone (dimethyl ketone)	Flavourings, colours, food oils	< 30, 2, & 0.1		14
Amyl acetate	Flavourings, colours			
Benzyl alcohol	Flavourings, colours, fatty acids			
Butane	Flavourings, food oils	< 1, 01		23
Butane-1,3-diol	Flavourings			23
Butan-1-ol	Fatty acids, flavourings, colours	< 1000		28
Butan-2-ol	Flavourings	1		
Butyl acetate				
Carbon dioxide				
Cyclohexane	Flavourings, food oils	< 1		23
Dibutyl ether	Flavourings	< 2		
1,2-Dichloroethane (Dichloroethane)	Decaf. coffee	< 5		23
Dichlorodifluoromethane	Flavourings, colours	< 1		19
Dichlorofluoromethane	Flavourings	< 1		
Dichloromethane	Flavourings, colours, decaf. coffee, food oils	< 2, 5, 10		27

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Dichlorotetrafluoroethane	Flavourings	< 1		
Diethyl citrate	Flavourings, colours			27
Diethyl ether	Flavourings, colours	< 2		
Di-isopropylketone				
Ethanol				
Ethyl acetate				
Nitrous oxide				29
n-Octyl alcohol	Citric acid			
Pentane	Flavourings, food oils	< 1		
Petroleum ether (light petroleum)	Flavourings, food oils	< 1		25
Propane	Flavourings, food oils	< 1, 0.1		
Propane-1,2-diol	Fatty acids, flavourings, colours			
Propane-1-ol	Fatty acids, flavourings, colours			28
Tertiary butyl alcohol				
1,1,2-Trichloroethylene	Flavourings, food oils	< 2		27
Trichlorofluoromethane	Flavourings	< 1		
Tridodecylamine	Citric acid			
Toluene	Flavourings	< 1		
Ethylmethylketone (butanone)	Fatty acids, flavourings, colourings. Decaffeination of coffee, tea	< 2		28
Glycerol tributyrate	Flavourings, colours			
Glycerol tripropionate	Flavourings, colours			
Heptane	Flavourings, food oils	< 1		14
Hexane	Flavourings, food oils	< 0.1		14
	<b>Chocolate and chocolate products</b>	1		
	<b>Ref ALINORM 03/12</b>			
	<b>34<sup>th</sup> Session</b>			
Isobutane	Flavourings	< 1		
Isoparaffinic petroleum hydrocarbons	Citric acid			
Isopropyl myristate	Flavourings, colours			
Methylene chloride (dichloromethane)	Food oils	< 0.02		28
Methyl acetate	Coffee decaf-feination, flavouring, Sugar refining	20 1		
Methyl propanol-1	flavourings	1		
<b><u>Washing and peeling agents</u></b>				
A mixture of alkylene oxide adducts of alkyl alcohol and phosphate esters of alkylene oxide adducts of alkyl alcohols consisting of alpha-alkyl(C12-C18)-omega-hydroxy-poly(oxethylene)(7.5-8.5 moles) poly(oxypropylene) block copolymer having an average molecular weight of 810, alpha-alkyl-(C12-C18)-omega-hydroxy-poly(oxyethylene) (3.3-3.7 moles) polymer having an average molecular weight of 380, and	Fruits and vegetables	< 0.001 up to 0.01	None	

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
subsequently esterified with 1.25 moles phosphoric anhydride; and alpha-alkyl (C10-C12)-omega-hydroxy poly(oxyethylene) (11.9-12.9 moles)/poly(oxypropylene) copolymer having an average molecular weight of 810 and subsequently esterified with 1.25 moles phosphoric anhydride				
Alkylene oxide adducts of alkyl alcohols and fatty acids	Sugar beets	No information available		
Aliphatic acid mixture consisting of valeric, caproic, enanthic, caprylic, and pelargonic acids	Fruits and vegetables	0.04-0.11	None	
Alpha-alkyl-omega-hydroxy-poly(oxyethylene)	Sugar beets	0.001 in sugar beets 0 in sugar	None	
Ammonium chloride, quaternary	Sugar beets			
Ammonium orthophosphate	Fruits and vegetables			
Calcium chloride	Fruits and vegetables			
Calcium hydroxide	Sugar beets			
Calcium oxide	Sugar beets			
Carbamate	Sugar beets			
Dialkanolamine	Sugar beets	0.001 in sugar beets 0 in sugar	None	
Diammonium orthophosphate	Fruits and vegetables for canning			
Diammonium orthophosphate, (5% aqueous solution)	Fruits and vegetables for canning			
Dithiocarbamate	Sugar beets			
Ethylene dichloride	Sugar beets	0.00001 in sugar beets, 0 in sugar	None	23
Ethylene glycol monobutyl ether	Sugar beets	0.00003 in sugar beets, 0 in sugar	None	
Hydrogen peroxide		No information available		24
Linear undecylbenzenesulfonic acid	Sugar beets	0.001 in sugar beets, 0 in sugar	None	
Monoethanolamine	Fruits and vegetables, sugar beets	100		
Monoethanolamine	Sugar beets	0.0001 in sugar beets, 0 in sugar	None	
Monoethanolamine (8%)	Fruits and vegetables for canning	1		
Organophosphates	Sugar beets			
Polyacrylamide	Fruits and vegetables, sugar beets	< 1	None	
Potassium bromide	Fruits and vegetables	No information available		
Sodium dodecylbenzenesulfonate (alkyl group predominantly C12 and not less than 95 percent C10-C16)	Fruits and vegetables, meat and poultry	< 2	None	
Sodium 2-ethylhexyl sulphate	Fruits and vegetables	< 20	None	
Sodium carbonate				

Category	Areas of use	Residues (mg/kg)	Interaction with food	JECFA evaluation
Sodium hydroxide	Fruits and vegetables, sugar beets			
Sodium hydroxide (10%, max.)	Fruits and vegetables for canning			
Sodium hydroxide (2%)	Mackerel for canning			
Sodium hypochlorite	Fruits and vegetables	No information available		
Sodium mono- and di-methyl naphthalene-sulfonates (mol. wt. 245-260)	Fruits and vegetables	< 0.2	None	
Sodium n-alkylbenzenesulfonate (alkyl group predominantly C12 and C13 and not less than 95 percent C10-C16)	Fruits and vegetables	Same as sodium dodecylbenzene-sulfonate	None	
Sodium tripolyphosphate				
Tetrapotassium pyrophosphate	Sugar beets	0.00002 in sugar beets 0 in sugar	None	26
Tetrasodium ethylenediaminetetraacetate	Sugar beets	0.000003 in sugar beets 0 in sugar	None	17
Triethanolamine	Sugar beets	0.00005 in sugar beets 0 in sugar	None	
<b><u>Other processing aids</u></b>				
Aluminum oxide				
Aluminum potassium sulfate				22
Ammonium nitrate				
Calcium tartrate				
Erythorbic acid				17
Ethyl parahydroxybenzoate				17
Gibberellic acid				
Glycerol ester of adipic acid				
Hydrogen				
Magnesium tartrate				
Polyvinyl polypyrrolidone	Beverages			27
Potassium gibberellate				
Propyl parahydroxybenzoate				17
Sodium				
Sodium hypochlorite				
Sodium silicates				

**APPENDIX A****CODEX INVENTORY OF ALL COMPOUNDS USED AS PROCESSING AIDS****(includes substances that may serve other functions)****Antifoam agents**

- (2) Aluminum stearate
- (2) Butyl stearate
- (3) Butylated hydroxyanisole (as antioxidant in defoamers)
- (3) Butylated hydroxytoluene (as antioxidant in defoamers)
- (2) Calcium stearate
- (2) Dimethylpolysiloxane
- (2) Fatty acids
- (1) Fatty acid methyl ester
- (1) Fatty acid polyalkylene glycol ester (1-5 moles ethylene oxide or propylene oxide)
- (1) Fatty alcohols (C8-C30)
- (1) Formaldehyde
- (1) Hydrogenated coconut oil
- (2) Hydroxylated lecithin
- (2) Magnesium stearate
- (3) Margarine
- (2) Mineral oil
- (2) Mono- and diglycerides of fatty acids
- (2) n-Butoxypolyoxyethylene polyoxypropylene glycol
- (2) Odourless light petroleum hydrocarbons
- (2) Oleic acid from tall oil fatty acids
- (1) Oxoalcohols C9-C30
- (2) Oxystearin
- (2) Petroleum wax
- (2) Petroleum wax (synthetic)
- (2) Petrolatum
- (2) Polyacrylic acid, sodium salt
- (2) Polyethylene glycol
- (2) Polyethylene glycol (400) dioleate
- (2) Polyethylene glycol (600) dioleate
- (2) Polyglycerol esters of fatty acids
- (2) Polyoxyethylene 40 monostearate
- (1) Polyoxyethylene esters of C8-C30 fatty acids
- (1) Polyoxypropylene esters of C8-C30 fatty acids
- (1) Polyoxyethylene esters of C9-C30 oxoalcohols
- (1) Polyoxypropylene esters of C9-C30 oxoalcohols
- (1) Mixtures of polyoxyethylene and polyoxypropylene esters of C8-C30 fatty acids
- (2) Polypropylene glycol
- (2) Polysorbate 60
- (2) Polysorbate 65
- (2) Polysorbate 80
- (2) Potassium stearate
- (2) Propylene glycol alginate
- (2) Propylene glycol mono- and di-esters of fats and fatty acids
- (2) Silicon dioxide

- (2) Sorbitan monolaurate
- (2) Sorbitan monostearate
- (2) Soybean oil fatty acids
- (2) Tallow
- (2) Tallow, hydrogenated, oxidized or sulphated
- (2) Tallow alcohol, hydrogenated
- (3) Vegetable oil

### **Catalysts**

- (1) Alloys of 2 or more listed metals
- (1) Aluminum
- (2) Ammonia
- (2) Ammonium bisulfite
- (2) Calcium chloride
- (1) Chromium
- (1) Copper
- (1) Copper chromate
- (1) Copper chromite
- (2) Ferrous sulfate
- (1) Manganese
- (1) Magnesium oxide
- (1) Molybdenum
- (1) Nickel
- (1) Palladium
- (1) Platinum
- (1) Potassium metal
- (1) Potassium methylate (methoxide)
- (1) Potassium ethylate (ethoxide)
- (1) Silver
- (1) Sodium amide
- (2) Sodium chloride
- (1) Sodium ethylate
- (2) Sodium hydroxide
- (2) Sodium metabisulfite
- (1) Sodium metal
- (1) Sodium methylate (methoxide)
- (2) Sulfur dioxide
- (1) Trifluoromethane sulfonic acid
- (1) Various metal oxides
- (1) Zirconium

### **Clarifying agents/filtration aids**

- (1) Absorbent clays (bleaching, natural, or activated earths)
- (2) Acacia
- (1) Active carbon
- (2) Agar
- (1) Albumin
- (1) Asbestos
- (1) Bentonite
- (1) Calcium oxide

- (2) Carbon dioxide
- (2) Carrageenan/Furcelleran
- (2) Casein
- (2) Cellulose
- (2) Cellulose powder
- ( ) Chloromethylated aminated styrene-divinylbenzene resin
- (2) Citric acid
- (1) Diatomaceous earth
- ( ) Divinylbenzene-ethylvinylbenzene copolymer
- ( ) Fuller's earth
- (2) Gelatin (edible)
- (1) Ion exchange resins (see **Ion exchange resins**)
- (1) Isinglass
- (1) Kaolin
- (1) Magnesium acetate
- (1) Perlite
- (2) Phosphoric acid
- ( ) Polyacrylamide/polysodium acrylate copolymer
- ( ) Polymaleic acid and sodium polymaleate
- (2) Polyvinylpyrrolidone
- (2) Polyvinylpolypyrrolidone
- (2) Potassium ferrocyanide
- (2) Silicon dioxide amorphous - silica hydrogel
- (2) Sodium alginate
- (2) Stabilized aqueous silica sol
- (2) Sulfur dioxide
- (2) Tannic acid
- (1) Tannin (to be specified)
- (1) Vegetable carbon (activated)
- (1) Vegetable carbon (unactivated)
- (2) Wood flour/Sawdust

#### **Colour stabilizers**

- (2) Dextrose
- (2) Sodium acid pyrophosphate
- (2) Sulphur dioxide

#### **Contact freezing and cooling agents**

- (2) Brine (eg. salt brine)
- (2) Carbon dioxide
- ( ) Dichlorodifluoromethane
- (1) Dichlorofluoromethane
- (1) Freon (to be specified)
- (2) Glycerol
- (1) Nitrogen

#### **Desiccating agent/anticaking agents**

- ( ) Aluminum stearate
- (2) Calcium aluminum silicate
- (1) Calcium phosphate

- (2) Calcium silicate
- ( ) Calcium stearate
- (2) Magnesium carbonate, heavy
- (2) Magnesium carbonate, light
- (2) Magnesium oxide, heavy
- (2) Magnesium oxide, light
- (2) Magnesium silicate, synthetic
- ( ) Magnesium stearate
- (2) Magnesium trisilicate
- (1) Octadecylammonium acetate (in ammonium chloride)
- (1) Potassium aluminum silicate : change to category (2),Ref. 57
- (2) Silicon dioxide
- (2) Silicon dioxide amorphous - silica gel
- (2) Sodium aluminum silicate
- ( ) Sodium calcium silicoaluminate
- (2) Tricalcium diorthophosphate

#### **Detergents (wetting agents)**

- (1) Dioctyl sodium sulfosuccinate (10 ppm in fruit drinks)
- (1) Methyl glucoside of coconut oil ester (320 ppm in molasses)
- (1) Quaternary ammonium compounds
- (1) Sodium lauryl sulphate
- (1) Sodium xylene sulphonate

#### **Enzyme immobilization agents and supports**

- (1) Glutaraldehyde
- (1) Glass
- (1) Diatomaceous earth
- (2) Carrageenan (including Furcelleran)
- (1) Ceramics
- (1) Diethylaminoethyl cellulose
- (2) Gelatin
- (1) Ion exchange resins
- (1) Polyethylenimine
- (2) Sodium alginate

#### **Enzyme preparations (including immobilized enzymes)**

##### **Animal-derived preparations**

- (1) Alpha-amylase (hog or bovine pancreas)
- (1) Catalase (bovine or horse liver)
- (1) Chymosin (calf, kid, or lamb abomasum)
- (1) Lipase (bovine stomach)  
(salivary glands or forestomach of calf, kid, or lamb)  
(hog or bovine pancreas)
- (1) Lysozyme change to category 2 (ref 57) (chicken egg whites)
- (1) Pepsin (hog stomach)
- (1) Pepsin, avian (proventricum of poultry)
- ( ) Phospholipase (pancrease)

- (1) Rennet (bovine, calf, goat, kid, or sheep, lamb stomach)  
 (1) Trypsin (porcine or bovine pancreas)

**Plant-derived preparations**

- (1) Bromelain (*Ananas spp.*)  
 (1) Chymopapain (*Carica papaya*)  
 (1) Ficin (*Ficus spp.*)  
 ( ) Liposydase (soya)  
 (1) Malt carbohydrases (malt barley and barley)  
 (1) Papain (*Carica papaya*)

**Microbiological origin (see Appendix B for list by microbial source)**

- (1) Alcohol dehydrogenase (*Saccharomyces cerevisiae*)  
 (1) Alpha amylase (*Aspergillus niger*)  
 (*Aspergillus oryzae*)  
 (*Bacillus licheniformis*)  
**(*Bacillus licheniformis* containing a genetically engineered alpha-amylase gene from *B.licheniformis*)**  
**ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/27/12**  
 (*Bacillus stearothermophilus*)  
 (*Bacillus subtilis*)  
 (*Rhizopus delemar*)  
 (*Rhizopus oryzae*)  
 (1) Alpha galactosidase (*Aspergillus niger*)  
 (*Mortierella vinacea sp.*)  
 (*Saccharomyces carlsbergensis*)  
 (1) Arabino-furanosidase (*Aspergillus niger*)  
 (1) Beta amylase (*Bacillus cereus*)  
 (*Bacillus megaterium*)  
 (*Bacillus subtilis*)  
 (1) Beta glucanase (*Aspergillus niger*)  
 (*Bacillus subtilis*)  
 (*Trichoderma harzianum*)  
 (1) Beta glucosidase (*Trichoderma harzianum*)  
 (1) Catalase (*Aspergillus niger*)  
 (*Micrococcus lysodeicticus*)  
 (1) Cellobiase or betaglucosidase (*Aspergillus niger*)  
 (*Trichoderma reesei*)  
 (1) Cellulase (*Aspergillus niger*)  
 (*Aspergillus oryzae*)  
 (*Rhizopus delemar*)  
 (*Rhizopus oryzae*)  
 (*Sporotrichum dimorphosporum*)  
 (*Trichoderma reesei*)  
 (*Thielavia terrestris*)  
 (1) Dextranase (*Aspergillus species*)  
 (*Bacillus subtilis*)  
 (*Klebsiella aerogenes*)

	<i>(Penicillium funiculosum)</i>
	<i>(Penicillium lilacinum)</i>
(1) Endo-beta glucanase	<i>(Aspergillus niger)</i> <i>(Aspergillus oryzae)</i> <i>(Bacillus circulans)</i> <i>(Bacillus subtilis)</i> <i>(Penicillium emersonii)</i> <i>(Rhizopus delemar)</i> <i>(Rhizopus oryzae)</i> <i>(Trichoderma reesei)</i> <i>(Disporotrichum dimorphosporum)</i>
(1) Esterase	<i>(Mucor miehei)</i>
(1) Exo-alpha glucosidase	<i>(Aspergillus niger)</i>
(1) Exo-alpha glucosidase (immobilized)	(same sources as above)
(1) Glucoamylase or amyloglucosidase	<i>(Aspergillus awamori)</i> <i>(Aspergillus niger)</i> <i>(Aspergillus oryzae)</i> <i>(Rhizopus arrhizus)</i> <i>(Rhizopus delemar)</i> <i>(Rhizopus niveus)</i> <i>(Rhizopus oryzae)</i> <i>(Trichoderma reesei)</i>
(1) Glucose isomerase	<i>(Actinoplanes missouriensis)</i> <i>(Arthrobacter sp.)</i> <i>(Bacillus coagulans)</i> <i>(Streptomyces albus)</i> <i>(Streptomyces olivaceus)</i> <i>(Streptomyces olivochromogenes)</i> <i>(Streptomyces rubiginosus)</i> <i>(Streptomyces sp.)</i> <i>(Streptomyces violaceoniger)</i>
(1) Glucose isomerase (immobilized)	(same sources as above)
(1) Glucose oxidase	<i>(Aspergillus niger)</i>
(1) Hemicellulase	<i>(Aspergillus niger)</i> <i>(Aspergillus oryzae)</i> <i>(Bacillus subtilis)</i> <i>(Rhizopus delemar)</i> <i>(Rhizopus oryzae)</i> <i>(Sporotrichum dimorphosporum)</i> <i>(Trichoderma reesei)</i>
(1) Inulinase	<i>(Aspergillus niger)</i> <i>(Kluyveromyces fragilis)</i> <i>(Sporotrichum dimorphosporum)</i> <i>(Streptomyces sp.)</i>
(1) Invertase	change to category (2), Ref. 57 <i>(Aspergillus niger)</i> <i>(Bacillus subtilis)</i> <i>(Kluyveromyces fragilis)</i> <i>(Saccharomyces carlsbergensis)</i> <i>(Saccharomyces cerevisiae)</i> <b>ref 57<sup>th</sup> JECFA ADI not specified;34<sup>th</sup> CCFAC</b> <b>ALINORM 03/12</b> <i>(Saccharomyces sp.)</i>

(1) Isoamylase	( <i>Bacillus cereus</i> )
<b>(1) Laccase</b>	<b>(<i>Myceliophthorathermophila</i> expressed in <i>Aspergillus oryzae</i>)</b> <b>ref 61<sup>st</sup> JECFA ADI acceptable; 34<sup>th</sup> CCFAC ALINORM 03/12</b>
(1) Lactase (Beta-galactosidase)	( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) ( <i>Kluyveromyces fragilis</i> ) ( <i>Kluyveromyces lactis</i> ) ( <i>Saccharomyces sp.</i> )
(1) Lactoperoxidase	change to category (2), Ref. 57
(1) Lipase	change to category (2), Ref. 57 ( <i>Aspergillus flavus</i> ) ( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) ( <i>Brevibacterium lineus</i> ) ( <i>Candida lipolytica</i> ) ( <i>Mucor javanicus</i> ) ( <i>Mucor miehei</i> ) ( <i>Mucor pusillus</i> ) ( <i>Rhizopus arrhizus</i> ) ( <i>Rhizopus delemar</i> ) ( <i>Rhizopus nigrican</i> ) ( <i>Rhizopus niveus</i> )
(1) Malic acid decarboxylate	( <i>Leuconostoc oenos</i> )
(1) Maltase or alphasglucosidase	( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) ( <i>Rhizopus oryzae</i> ) ( <i>Trichoderma reesei</i> )
(1) Melibiase( alphasgalactosidase)	( <i>Mortierella vinacea sp.</i> ) ( <i>Saccharomyces carlsbergensis</i> )
<b>(1) Mixed xylanase, beta-glucanase enzyme preparation</b>	<b>(<i>Humicola insolens</i>)</b> <b>ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/27/12</b>
(1) Nitrate reductase	( <i>Micrococcus violagabriella</i> )
(1) Pectinase	( <i>Aspergillus awamori</i> ) ( <i>Aspergillus foetidus</i> ) ( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) ( <i>Penicillium simplicissium</i> ) ( <i>Rhizopus oryzae</i> ) ( <i>Trichoderma reesei</i> )
(1) Pectin esterase	( <i>Aspergillus niger</i> )
(1) Pectinlyase	( <i>Aspergillus niger</i> )
(1) Polygalacturonase	( <i>Aspergillus niger</i> )
(1) Protease	( <i>Aspergillus melleus</i> ) ( <i>Aspergillus niger</i> ) ( <i>Aspergillus oryzae</i> ) ( <i>Bacillus cereus</i> ) ( <i>Bacillus licheniformis</i> )

	<i>(Bacillus subtilis)</i>
	<i>(Brevibacterium lineus)</i>
	<i>(Endothia parasitica)</i>
	<i>(Lactobacillus casei)</i>
	<i>(Micrococcus caseolyticus)</i>
	<i>(Mucor miehei)</i>
	<i>(Mucor pusillus)</i>
	<i>(Streptococcus cremoris)</i>
	<i>(Streptococcus lactis)</i>
	<i>(Bacillus acidopullulyticus)</i>
(1) Pullulanase	<i>(Bacillus subtilis)</i> <i>(Klebsiella aerogenes)</i>
(1) Serine proteinase	<i>(Streptomyces fradiae)</i> <i>(Bacillus licheniformis)</i>
(1) Tannase	<i>(Aspergillus niger)</i> <i>(Aspergillus oryzae)</i>
(1) Xylanase	<i>(Aspergillus niger)</i> <i>(Sporotrichum dimorphosporum)</i> <i>(Streptomyces sp.)</i> <i>(Trichoderma reesei)</i> <b><i>(Thermomyces lanuginosus</i> expressed in <i>Fusarium venenatum</i>)</b>
	<b>ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/27/12</b>
( ) $\beta$ -xylosidase	<i>(Trichoderma reesei)</i>

**Solvents (extraction and processing)**

- (1) Acetone (dimethyl ketone)
- (2) Ammonia in methanol/ethanol
- (1) Amyl acetate
- (1) Benzyl alcohol
- (2) Benzyl benzoate
- (1) Butane
- (1) Butane-1,3-diol
- (1) Butan-1-ol
- (2) Butan-2-ol
- (2) Butyl acetate
- (2) Carbon dioxide
- (2) Castor oil
- (1) Cyclohexane
- (1) Dibutyl ether
- (1) 1,2-Dichloroethane (Dichloroethane)
- (1) Dichlorodifluoromethane
- (1) Dichlorofluoromethane
- (1) Dichloromethane
- (1) Dichlorotetrafluoroethane
- (1) Diethyl citrate
- (1) Diethyl ether
- (2) Diethyl tartrate
- (1) Di-isopropylketone
- (2) Ethanol

- (2) Ethyl acetate
- (2) Ethyl lactate
- (1) Ethylmethylketone (butanone)
- (2) Glycerol
- (2) Glycerol mono- di- and triacetate
- (1) Glycerol tributyrate
- (1) Glycerol tripropionate
- (1) Heptane
- (1) Hexane
- (1) Isobutane
- ( ) Isobutanol (2-methylpropan-1-ol)
- (1) Isoparaffinic petroleum hydrocarbons
- (2) Isopropyl alcohol
- (1) Isopropyl myristate
- (2) Methanol
- (2) Methyl acetate
- (1) Methylene chloride (dichloromethane)
- ( ) Methyl propanol-1
- (2) Nitric acid
- (1) Nitrous oxide
- (1) 2-Nitropropane
- (1) n-Octyl alcohol
- (1) Pentane
- (1) Petroleum ether (light petroleum)
- (1) Propane
- (1) Propane-1,2-diol
- (1) Propane-1-ol
- (2) Propane-2-ol (isopropyl alcohol)
- (1) Tertiary butyl alcohol
- (1) 1,1,2-Trichloroethylene
- (1) Trichlorofluoroethylene
- ( ) Trichlorofluoromethane
- (1) Tridodecylamine
- (1) Toluene
- (2) Water

#### **Fat crystal modifiers**

- (4) Lecithin
- (4) Oxystearin
- (4) Polyglycerol esters of fatty acids
- (4) Polysorbate 60
- (4) Sodium dodecylbenzene sulphonate
- (4) Sodium lauryl sulphate
- (4) Sorbitan monostearate
- (4) Sorbitan tristearate

#### **Flocculating agents**

- ( ) Acrylamide resins
- (1) Acrylate-acrylamide resin
- (2) Aluminum ammonium sulfate

- (2) Aluminum sulfate
- (2) Citric acid
- (1) Complexes of soluble aluminum salt and phosphoric acid
- ( ) Dimethylamine-epichlorohydrin copolymer
- (1) Fuller's earth (calcium analogue of sodium montmorillonite)
- (2) Gelatin
- (1) Isinglass
- (1) Dried and powdered blood plasma
- (1) Modified acrylamide resin
- (1) Polyacrylic acid
- (2) Polyacrylic acid, sodium salt
- (1) Polyacrylamide
- (2) Silica
- (2) Sodium alginate
- (1) Sodium polyacrylate
- (1) Trisodium diphosphate
- (1) Trisodium orthophosphate

### **Ion exchange resins, membranes, and molecular sieves**

#### **Resins:**

- (1) Completely hydrolyzed copolymers of methyl acrylate and divinylbenzene.
- (1) Completely hydrolyzed terpolymers of methyl acrylate, divinylbenzene and acrylonitrile.
- (1) Cross-linked phenolformaldehyde activated with one or both of the following:
  - Triethylenetetramine
  - Tetraethylenepentamine
- (1) Cross-linked polystyrene, first chloromethylated then aminated with trimethylamine, dimethylamine, diethylenetriamine or dimethylethanolamine.
- (1) Diethylenetriamine, triethylenetetramine, tetraethylenepentamine cross-linked with epichlorohydrin.
- (1) Epichlorohydrin cross-linked with ammonia.
- (1) Methacrylic acid-divinylbenzene copolymer.
- (1) Methacrylic acid-divinylbenzene copolymer with RCOO active groups.
- (1) Methyl acrylate-divinylbenzene copolymer containing not less than 2 percent by weight of divinylbenzene, aminolyzed with dimethylaminopropylamine.
- (1) Methyl acrylate-divinylbenzene copolymer containing not less than 3.5 percent by weight of divinylbenzene, aminolyzed with dimethyl-amino- propylamine.
- (1) Methyl acrylate-divinylbenzenediethylene glycol divinyl ether terpolymer containing not less than 3.5 percent by weight of divinylbenzene and not more than 0.6 percent by weight of diethylene glycol divinyl ether, aminolyzed with dimethylaminopropylamine.  
Methyl acrylate-divinylbenzene-diethylene glycol divinyl ether terpolymer containing not less than 7 percent by weight of divinylbenzene and not more than 2.3 percent by weight of diethylene glycol divinyl ether, aminolyzed with dimethylaminopropyl-amine and quaternized with methyl chloride.  
Polystyrene-divinylbenzene reticulum with trimethylammonium groups.
- (1) Reaction resin of formaldehyde, acetone and tetraethylene-pentamine.
- (1) Styrene-divinylbenzene cross-linked copolymer, first chloromethylated then aminated with dimethylamine and oxidized with hydrogen peroxide whereby the resin contains not more than 15 percent by weight of vinyl N,N-dimethylbenzylamine-N-oxide and not more than 6.5 percent by weight of nitrogen.
- (1) Sulfite-modified cross-linked phenol-formaldehyde, with modification resulting in sulfonic acid groups on side chains.
- (1) Sulfonated anthracite coal meeting the requirement of American Society for Testing and Materials D388-38, Class I, Group 2.
- (1) Sulfonated copolymer of styrene and divinylbenzene.

- (1) Sulfonated terpolymers of styrene, divinylbenzene and acrylonitrile or methyl acrylate.
- (1) Sulfonated tetrapolymer or styrene, divinylbenzene, acrylonitrile and methyl acrylate derived from a mixture of monomers containing not more than a total of 2 percent by weight of acrylonitrile and methyl acrylate.

**Counter ions:**

Aluminum	Chloride	Potassium
Bicarbonate	Hydronium	Sodium
Calcium	Hydroxyl	Sulfate
Carbonate	Magnesium	

**Membranes:**

- (1) Polyethylene - polystyrene base modified by reaction with chloramethyl ether and subsequent amination with trimethylamine, diethylenetriamine or dimethylethanolamine.
- (1) Polymers and Polyethylene - polystyrene base modified by reaction with chloramethyl ether and subsequent amination with trimethylamine, diethylenetriamine or dimethylethanolamine.  
Polymers and copolymers containing the following components: cellulose (such as cellulose diacetate, cellulose triacetate, cellulose ethers, cellulose), Polysulfone-sulfonated polysulfone, Polyethersulfone-sulfonated polyethersulfone, Fluoropolymers (such as polyvinylidene fluoride, chlorotrifluoroethylene-vinylidene fluoride copolymer, polytetrafluoroethylene), Polysulfoneamides, aliphatic/aromatic Polyamide and copolyamides (such as polypiperazineamides, m-phenylenediamine trimesamide polymer), Polyesters (such as polyethyleneterephthalate), Polyolefins (such as polypropylene, polyethylene), Polyamide-imide polymers, Polyimides, Polyacrylonitriles, Polyvinylpyrrolidone, Polystyrene-sulfonated polystyrene, chitin/chitosan and derivatives, polyureas-polyurethanes, Polyethers, and Polyamines.

**Molecular sieves:**

- (1) Calcium aluminum silicate :change to category (2), Ref. 57
- (1) Sodium aluminum silicate :change to category (2), Ref. 57

**Lubricants, release and anti-stick agents, moulding aids**

- ( ) Acetic acid esters of fatty acid mono- and diglycerides
- (2) Acetylated monoglycerides
- (2) Beeswax
- (1) Bentonite
- (2) Butyl stearate
- (2) Carnauba wax
- (2) Calcium aluminum silicate
- (2) Calcium carbonate
- (2) Calcium phosphates
- (2) Calcium silicate
- (2) Calcium stearate
- (2) Castor oil
- (1) Dimethylpolysiloxane
- (2) Edible bone phosphate
- (2) Ethoxylated mono- and diglycerides
- (2) Fats and waxes of vegetable and animal origin
- (2) Fatty acids of tallow, of cottonseed and of soybean oil
- (2) Hydrogenated sperm oil
- (1) Kaolin
- (2) Lecithin
- (2) Magnesium carbonate
- (2) Magnesium oxide, light and heavy
- (2) Magnesium trisilicate

- (2) Mineral oil based greases (lubricants for pumps)
- (2) Mineral oil/Paraffin oil
- (2) Mineral oils and waxes
- ( ) Mono- and diglycerides of fatty acids
- (2) Oxidatively polymerised soya bean oil
- (2) Paraffin and paraffin oils
- (2) Partially hydrogenated vegetable oil (cottonseed, soy)
- (2) Polyglycerol esters of dimerised fatty acids of soya bean oil
- (2) Polyglycerol polylinoleate
- (2) Polyglycerol polyricinoleate
- ( ) Shellac
- ( ) Silicates (magnesium, potassium, sodium)
- (2) Silicon dioxide
- (2) Sodium aluminum silicate
- (2) Starches
- (2) Stearates (magnesium, calcium, and aluminum)
- ( ) Stearates (potassium and sodium)
- (2) Stearic acid
- (2) Stearins
- (2) Talc
- (2) Tetrasodium diphosphate
- (2) Tri-calcium phosphate
- (2) Vegetable triglycerides
- (2) Wax
- (2) Wax coatings

### **Micro-organism control agents**

- (1) Chlorine dioxide :suggest change to category (2), Ref. 57
- (3) Disodium cyanodithioamidocarbonate
- ( ) Disodium ethylene bis dithiocarbamate
- ( ) Dimethyldicarbonate
- (3) Ethylenediamine
- (1) Formaldehyde
- (1) Hydrogen peroxide
- (1) Hypochlorite
- (1) Iodophors
- (1) Lactoperoxidase system (lactoperoxidase, glucose oxidase, thiocyanate salt) : suggest change to category (2), Ref.57
- (3) N-alkyl (C12-C16) dimethyl benzylchloride
- (2) Natamycin
- (2) Nitric acid
- (1) Peracetic acid
- (3) Potassium N-methyldithiocarbamate
- (3) Propylene oxide
- (1) Quaternary ammonium compounds
- (1) Salts of sulfurous acid : suggest change to category (2), Ref. 57
- (3) Sodium chlorite
- ( ) Sodium dimethyldithiocarbamate
- (2) Sulfur dioxide

**Propellant and packaging gases**

- (1) Air
- (1) Argon
- (2) Carbon dioxide
- (1) Chloropentafluoroethane
- (1) Combustion product gas (to be specified)
- (2) Dichlorodifluoromethane
- (1) Helium
- (1) Hydrogen
- (1) Nitrous oxide
- (1) Nitrogen
- (1) Octafluorocyclobutane
- (2) Oxygen
- (1) Propane
- (1) Trichlorofluoromethane

**Washing and peeling agents**

- (1) A mixture of alkylene oxide adducts of alkyl alcohols and phosphate esters of alkylene oxide adducts of alkyl alcohols consisting of alpha-alkyl (C12-C18) -omega -hydroxy -poly(oxyethylene) (7.5-8.5 moles)/poly(oxypropylene) block copolymer having an average molecular weight of 810, alpha-alkyl (C12-C18) -omega -hydroxy -poly(oxyethylene) (3.3-3.7 moles) polymer having an average molecular weight of 380, and subsequently esterified with 1.25 moles phosphoric anhydride; and alpha-alkyl (C10-C12) -omega -hydroxy -poly(oxy-ethylene) (11.9-12.9 phosphoric anhydride; and alpha-alkyl (C10-C12) -omega -hydroxy -poly(oxyethylene) (11.9-12.9 moles)/poly(oxypropylene) copolymer having an average molecular weight of 810 and subsequently esterified with 1.25 moles phosphoric anhydride.
- (1) Alkylene oxide adducts of alkyl alcohols and fatty acids
- (1) Aliphatic acid mixture consisting of valeric, caproic, enanthic, caprylic, and pelargonic acids.
- (1) Alpha-alkyl-omega-hydroxy-poly(oxyethylene)
- (2) Ammonium chloride
- ( ) Ammonium orthophosphate
- (2) Calcium chloride
- (2) Calcium hydroxide
- (2) Calcium oxide
- ( ) Carbamate
- (1) Dialkanolamine
- ( ) Diammonium orthophosphate
- ( ) Dithiocarbamate
- (1) Ethylene dichloride
- (1) Ethylene glycol monobutyl ether
- (1) Hydrogen peroxide
- (1) Linear undecylbenzenesulfonic acid
- (1) Monoethanolamine
- (1) Monoethanolamine, 8%
- (1) Nitrogen
- (2) Oleic acid
- ( ) Organophosphates
- (1) Polyacrylamide
- (1) Potassium bromide
- (2) Sodium carbonate

- (1) Sodium dodecylbenzene sulfonate (alkyl group predominantly C12 and not less than 95 percent C10-C16)
- (1) Sodium 2-ethylhexyl sulphate
- (2) Sodium hydroxide
- (2) Sodium hydroxide, 10%
- (2) Sodium hydroxide, 2%
- (1) Sodium hypochlorite
- (1) Sodium mono- and di-methyl naphthalene sulfonates (mol. wt. 245-260)
- (1) Sodium n-alkylbenzene-sulfonate (alkyl group predominately C12 and C13 and not less than 95 percent C10-C16)
- (2) Sodium tripolyphosphate
- (2) Sulfuric acid
- (1) Tetrapotassium pyrophosphate
- (1) Tetrasodium ethylenediaminetetraacetate
- (1) Triethanolamine

### **Yeast nutrients**

- (3) Ammonium chloride
- (3) Ammonium sulphate
- (3) Ammonium phosphates
- (3) B-Complex vitamins
- (3) Biotin
- (3) Calcium carbonate
- (3) Calcium phosphates
- (3) Calcium sulphate
- (3) Cupric sulphate
- (3) Ferrous ammonium sulphate
- (3) Ferrous sulphate
- (3) Inositol
- (3) Magnesium sulfate
- (3) Niacin
- (3) Pantothenic acid
- (3) Potassium carbonate
- (3) Potassium chloride
- (3) Potassium hydrogen carbonate
- (3) Yeast autolysates
- (3) Zinc sulphate

### **Other processing aids**

- (2) Acetic acid
- ( ) Acrylic resin with primarily tertiary amino groups
- ( ) Alkylene oxide adduct
- (2) Allyl isothiocyanate
- (1) Aluminum oxide
- (1) Aluminum potassium sulfate
- (2) Ammonium bicarbonate
- (1) Ammonium nitrate
- (2) Amyl acetate
- (2) Benzyl alcohol
- (2) BHA
- (2) BHT

- (2) Calcium carbonate
- (2) Calcium chloride
- (2) Calcium citrate
- (2) Calcium hydroxide
- ( ) Calcium oxide
- (2) Calcium phosphates
- (2) Calcium sulfate
- (1) Calcium tartrate
- (2) Caramel flavoring
- ( ) Carbon dioxide
- (2) Citric acid
- (2) Coconut oil
- (2) Disodium hydrogen phosphate
- (1) Erythorbic acid: suggest change to category (2), Refs. 57, 58
- (1) Ethyl para hydroxybenzoate
- ( ) Ethylene oxide-propylene oxide copolymers
- (2) Fatty acids of soybean oil
- ( ) Fatty alcohol-glycol ether
- (2) Fractionated soybean oil
- (2) Fumaric acid
- (1) Gibberellic acid
- (1) Glycerol ester of adipic acid
- (2) Glycerol tripropionate
- (2) Glycine
- (1) Hydrogen
- (2) Hydrochloric acid
- (2) Hydrogenated soybean oil
- ( ) Hydrophilic fatty acyl esters, linked to a neutral carrier
- (2) Isopropyl alcohol
- (2) Lactic acid
- (2) Lactylated mono esters
- (2) Magnesium chloride
- (2) Magnesium citrate
- ( ) Magnesium oxide
- (2) Magnesium sulfate
- (2) Magnesium hydroxide
- (2) Magnesium phosphates
- (1) Magnesium tartrate
- ( )  $\alpha$ -Methyl glycoside water
- ( ) Methyl glycoside coconut oil ester
- (2) Methyl paraben (Methyl parahydroxybenzoate)
- (2) Mineral oil
- ( ) Mixture of ethylene and propylene oxides, copolymers and esters, castor oil and polyethylene glycol ester
- ( ) Mixture of naturally occurring and synthetic fatty acyl derivatives, with added emulgators
- ( ) Modified higher alcohol
- ( ) Mono- and diglycerides of fatty acids from feed fat (E471)
- ( ) Mono- and diglycerides of fatty acids from feed fat, esterified with acetic acid, lactic acid and citric acid
- ( ) Non-ionogenic alkylene oxide adduct with emulgator

- (2) Oxalic acid
- (2) Paraffin
- (2) Phosphoric acid
- ( ) Polyalkylene oxide, in combination with special fatty alcohols
- ( ) Polyethoxylated alcohol, modified
- ( ) Polyacrylate
- ( ) Polyacrylate with carboxyl groups
- ( ) Polyethylene glycol
- ( ) Polyglycol copolymer
- ( ) Polyphosphate
- ( ) Polypropylene-polyethylene block polymer
- (1) Polyvinyl polypyrrolidone
- (2) Polyvinylpyrrolidone
- (2) Potassium carbonate
- (2) Potassium chloride
- (2) Potassium citrate
- (1) Potassium gibberellate
- (2) Potassium nitrate
- (2) Potassium phosphates
- (2) Potassium sulfate
- (2) Potassium tartrate
- (2) Propyl gallate
- (2) Propan-1-ol
- (2) Propane-1,2-diol
- (1) Propyl parahydroxybenzoate : suggest change to category (2), Ref. 58
- (2) Shellac
- (2) Sandarac gum
- (1) Sodium
- (2) Sodium chloride
- (2) Sodium aluminosilicate
- (2) Sodium bisulfite
- (2) Sodium bicarbonate
- (2) Sodium carbonate
- (2) Sodium citrate
- (2) Sodium hexametaphosphate
- (2) Sodium hydroxide
- (1) Sodium hypochlorite
- (2) Sodium metabisulfite
- (2) Sodium phosphate monobasic
- (2) Sodium phosphate dibasic
- (2) Sodium phosphate tribasic
- ( ) Sodium polyacrylate
- ( ) Sodium polyacrylate-acrylamide resin
- (1) Sodium silicates
- (2) Sodium sulfate
- ( ) Sodium sulfite
- (2) Sodium tartrate
- ( ) Solution of: anhyd. polyphosphate, polycarboxylic acid salt, polyalkylene glycol, sodium hydroxide
- ( ) Sorbitan-fatty acyl esters and polyoxyethylene-20-sorbitan fatty acyl esters
- (2) Soy lecithin

- (2) Sulfuric acid
- (2) Sulphur dioxide
- ( ) Sulphonated copolymer of styrene and divinylbenzene
- ( ) Surface-active esters with neutral carriers
- ( ) Tannic acid with quebracho extract
- (2) Tartaric acid
- (2) TBHQ
- ( ) Vegetable fatty acid esters
- ( ) Vegetable fatty acyl (hydrophilic)
- (2) Xylose

**APPENDIX B****MICROBIAL ENZYMES FROM THE CODEX INVENTORY OF PROCESSING AIDS ARRANGED BY MICROORGANISM**

<i>(Actinoplanes missouriensis)</i>	(1) Glucose isomerase
<i>(Arthrobacter sp.)</i>	(1) Glucose isomerase
<i>(Aspergillus amaurii)</i>	(1) Glucoamylase or amyloglucosidase
<i>(Aspergillus awamora)</i>	(1) Pectinase
<i>(Aspergillus awamori)</i>	(1) Glucoamylase or amyloglucosidase (1) Pectinase
<i>(Aspergillus flavus)</i>	(1) Lipase
<i>(Aspergillus foetidus)</i>	(1) Pectinase
<i>(Aspergillus melleus)</i>	(1) Protease
<i>(Aspergillus niger)</i>	(1) Alpha amylase (1) Alpha galactosidase (1) Arabino-furanosidase (1) Beta glucanase (1) Catalase (1) Cellobiase or betaglucosidase (1) Cellulase (1) Endo-beta glucanase (1) Esterase (1) Exo-alpha glucosidase (1) Glucoamylase or amyloglucosidase (1) Glucose oxidase (1) Hemicellulase (1) Inulinase (1) Invertase (1) Lactase (1) Lipase (1) Maltase or alphaglucosidase (1) Melibrase (1) Pectin esterase (1) Pectinlyase (1) Poly-galacturonase (1) Protease (1) Tannase (1) Xylanase (1) Alpha amylase (1) Cellulase (1) Endo-beta glucanase (1) Glucoamylase or amyloglucosidase (1) Hemicellulase (1) Lactase (1) Lipase (1) Maltase or alphaglucosidase (1) Pectinase (1) Protease (1) Tannase
<i>(Aspergillus species)</i>	(1) Dextranase
<i>(Bacillus acidopullulyticus)</i>	(1) Pullulanase

<i>(Bacillus cereus)</i>	(1) Beta amylase (1) Isoamylase (1) Protease
<i>(Bacillus circulans)</i>	(1) Endo-beta glucanase
<i>(Bacillus coagulans)</i>	(1) Glucose isomerase
<i>(Bacillus licheniformis)</i>	(1) Protease (1) Alpha amylase (1) <b>Alpha amylase</b>
<b><i>(Bacillus licheniformis</i> containing a genetically engineered alpha-amylase gene from <i>B.licheniformis</i>)</b> <b>ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/2712</b>	(1) Serine proteinase
<i>(Bacillus megaterium)</i>	(1) Beta amylase
<i>(Bacillus stearothermophilus)</i>	(1) Alpha amylase
<i>(Bacillus subtilis)</i>	(1) Alpha amylase (1) Beta amylase (1) Beta glucanase (1) Dextranase (1) Endo-beta glucanase (1) Hemicellulase (1) Invertase (1) Protease (1) Pullulanase
<i>(Brevibacterium lineus)</i>	(1) Lipase (1) Protease
<i>(Candida lipolytica)</i>	(1) Lipase
<i>(Disporotrichum dimorphosporum)</i>	(1) Beta-glucanase
<i>(Endothia parasitica)</i>	(1) Protease
<b><i>(Humicola insolens)</i></b> <b>ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/27/12</b>	<b>(1) Mixed xylanase, beta-glucanase enzyme preparation</b>
<i>(Klebsiella aerogenes)</i>	(1) Dextranase (1) Pullulanase
<i>(Kluyveromyces fragilis)</i>	(1) Inulinase (1) Invertase (1) Lactase
<i>(Kluyveromyces lactis)</i>	(1) Lactase
<i>(Lactobacillus casei)</i>	(1) Proetase
<i>(Leuconostoc oenos)</i>	(1) Malic and decarboxylase
<i>(Micrococcus caseolyticus)</i>	(1) Protease
<i>(Micrococcus lysodeicticus)</i>	(1) Catalase
<i>(Mortierella vinacea sp.)</i>	(1) Alpha galactosidase (1) Melibrase
<i>(Mucor javanicus)</i>	(1) Lipase
<i>(Mucor miehei)</i>	(1) Esterase (1) Lipase (1) Protease

<i>(Mucor pusillus)</i>	(1) Lipase (1) Protease
<b><i>(Myceliophthorathermophila</i> expressed in <i>Aspergillus oryzae</i>)</b>	<b>(1) Laccase</b>
<b>ref 61<sup>st</sup> JECFA ADI acceptable; 34<sup>th</sup> CCFAC ALINORM 03/12</b>	
<i>(Penicillium emersonii)</i>	(1) Endo-beta glucanase
<i>(Penicillium funiculosum)</i>	(1) Dextranase
<i>(Penicillium lilacinum)</i>	(1) Dextranase
<i>(Penicillium simplicissium)</i>	(1) Pectinase
<i>(Rhizopus arrhizus)</i>	(1) Alpha amylase (1) Cellulase (1) Endo-beta glucanase (1) Glucoamylase or amyloglucosidase (1) Hemicellulase (1) Lipase
<i>(Rhizopus nigrican)</i>	(1) Lipase
<i>(Rhizopus niveus)</i>	(1) Glucoamylase or amyloglucosidase (1) Lipase
<i>(Rhizopus oryzae)</i>	(1) Cellulase (1) Endo-beta glucanase (1) Glucoamylase or amyloglucosidase (1) Hemicellulase (1) Maltase or alphaglucosidase (1) Pectinase
<i>(Saccharomyces carlsbergensis)</i>	(1) Alpha galactosidase (1) Invertase (1) Melibrase
<i>(Saccharomyces cerevisiae)</i>	(1) Alcohol dehydrogenase (1) Invertase <b>ref 57<sup>th</sup> JECFA ADI not specified;34<sup>th</sup> CCFAC ALINORM 03/12</b>
<i>(Saccharomyces sp.)</i>	(1) Invertase (1) Lactase
<i>(Sporotrichum dimorphosporum)</i>	(1) Cellulase (1) Hemicellulase (1) Inulinase (1) Xylanase
<i>(Streptococcus cremoris)</i>	(1) Protease
<i>(Streptococcus lactis)</i>	(1) Protease
<i>(Streptomyces albus)</i>	(1) Glucose isomerase
<i>(Streptomyces olivaceus)</i>	(1) Glucose isomerase
<i>(Streptomyces olivochromogenes)</i>	(1) Glucose isomerase
<i>(Streptomyces rubiginosus)</i>	(1) Glucose isomerase
<i>(Streptomyces violaceoniger)</i>	(1) Glucose isomerase
<i>(Streptomyces fradiae)</i>	(1) Serine proteinase

(*Streptomyces sp.*)

- (1) Glucose isomerase
- (1) Inulinase
- (1) Xylanase

(*Thermomyces lanuginosus* expressed in *Fusarium venenatum*)

- (1) Xylanase

ref 61<sup>st</sup> JECFA ADI not specified; 36<sup>th</sup> CCFAC ALINORM 04/2712

(*Trichoderma harzianum*)

- (1) Beta glucanase
- (1) Beta glucosidase

(*Trichoderma reesei*)

- (1) Cellobiase or betaglucosidase
- (1) Cellulase
- (1) Endo-beta glucanase
- (1) Esterase
- (1) Glucoamylase or amyloglucosidase
- (1) Hemicellulase
- (1) Maltase or alphaglucosidase
- (1) Pectinase
- (1) Xylanase
- (1) Beta-xylosidase

(*Thielavia terrestris*)

- (1) Cellulase