



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD ADDITIVES

Forty Third Session

Xiamen, China, 14 – 18 March 2011

INVENTORY OF SUBSTANCES USED AS PROCESSING AIDS (IPA), UPDATED LIST (INFORMATION DOCUMENT)

Prepared by New Zealand

BACKGROUND

1. The Codex Committee on Food Additives and Contaminants (CCFAC) at its 36th Session recognized that the development of a positive list of processing aids was not a realistic approach at the present time due to a lack of resources. However, the value of the Inventory of Processing Aids (IPA) itself, as a useful reference tool, has been recognized and the Committee agreed to maintain the IPA for the time being and decided that New Zealand would prepare updated versions of the IPA for consideration at subsequent sessions of the Committee¹.

2. The IPA includes:

- Substances in the original list in CAC/MISC 3;
- Additions to the IPA agreed to by CCFA up to and including the 42nd session in March 2010.

The title of the Inventory has been changed to the *Inventory of Substances used as Processing Aids* as discussed at the 40th Session. This is to recognise that substances used as processing aids may also have other uses including as food additives and food². For convenience and simplicity the acronym *IPA* continues to be used.

CHANGES INTRODUCED IN THIS UPDATE

3. The following new entries are proposed in **bold**:

i) Changes agreed to by CCFA 42 (Agenda item 3) - proposed by 71st JECFA:

- Branching glycosyltransferase from *Rhodothermus obamensis* expressed in *Bacillus subtilis* (also proposed by AMFEP).

ii) Additions to the enzyme section proposed by AMFEP (Association of Manufacturers and Formulators of Enzyme Products) as outlined in Attachment 1.

UPDATING ISSUES FOR FUTURE CONSIDERATION³

4. New Zealand is willing to provide further annual updates to the IPA.

¹ ALINORM 07/30/12 paragraph 134.

² ALINORM 07/30/12 paragraph 133

³ ALINORM 06/29/12 paragraph 95 and Appendix XV.

ATTACHMENT 1: Additions to enzyme section proposed by AMFEP 30 September 2010**Animal-Derived Enzyme Preparations:**

Phospholipase A

*(bovine pancreas)***Plant-Derived Enzyme Preparations:**

Ascorbate oxidase

(Cucurbita pepo)

Lipase

*(Carica papaya)***Microbiologically derived Enzyme Preparations:**

Acetylhexosaminidase, beta-L-N

(Streptomyces violaceoruber d-Streptomyces sp.)

Alginate lyase

(Sphingobacterium multivorum)

Aminopeptidase

(Aspergillus oryzae d-Aspergillus sp.)

AMP deaminase

(Aspergillus oryzae)

Alpha amylase

*(Bacillus licheniformis with modified gene from d-Geobacillus sp.)**(Bacillus licheniformis d-Pseudomonas sp.)**(Pseudomonas fluorescens with modified gene from d-Thermococcus sp.)**(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)*

Branching glycosyltransferase

(Bacillus subtilis d-Rhodothermus sp.)

Chitinase

(Streptomyces violaceoruber d-Streptomyces sp.)

Dextranucrase

(Leuconostoc mesenteroides)

Ferulic acid esterase

(Aspergillus niger)

Glucoamylase or amyloglucosidase

*(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)**(Trichoderma reesei or longibrachiatum with modified gene from d-**Trichoderma sp.)*

Glucanotransferase

(Bacillus amyloliquefaciens or subtilis d-Thermus sp.)

Glucose isomerase

(Streptomyces rubiginosus d-Streptomyces sp.)

Glucosidase (exo-1.3-beta)

(Trichoderma harzianum)

Glutaminase

(Aspergillus niger)

Glycerophospholipid cholesterol acyltransferase

(Bacillus licheniformis d-Aeromonas sp.)

Laccase

(Aspergillus niger)

Lipase, monoacylglycerol

(Penicillium camembertii)

Lipase, triacylglycerol

*(Bacillus licheniformis d-Aeromonas sp.)**(Pichia angusta or Hansenula polymorpha d-Fusarium sp.)*

Pectate lyase

(Bacillus subtilis)

Pectin methylesterase or Pectinesterase

(Aspergillus oryzae d-Aspergillus sp.)

Pentosanase

(Aspergillus niger)

(Bacillus amyloliquefaciens or subtilis) (Bacillus amyloliquefaciens or subtilis d-Bacillus sp.) (Humicola insolens)

(Trichoderma reesei or longibrachiatum)

Peroxidase

(Aspergillus niger d-Marasmius scorodonius)

Phospholipase A

(Aspergillus niger)

(Streptomyces violaceoruber d-Streptomyces sp.)

Phospholipase B

(Aspergillus niger)

(Aspergillus niger d-Aspergillus sp.)

Phospholipase D

(Streptomyces cinnamoneus)

Protease (incl. milkclotting enzymes)

(Aspergillus niger d-Camel stomach)

(Aspergillus sojae d-Aspergillus sp.)

(Bacillus clausii)

(Geobacillus caldoproteolyticus)

(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)

(Trichoderma reesei or longibrachiatum d-Bos Taurus)

Transglucosidase

(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)

(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)

Xylanase

(Talaromyces emersonii)

INVENTORY OF SUBSTANCES USED AS PROCESSING AIDS (IPA)

Prepared by New Zealand (December 2010)

BACKGROUND

1. The title of the Inventory has been changed to the *Inventory of Substances used as Processing Aids* to recognise that substances used as processing aids may also have other uses including as food additives and food⁴. For convenience and simplicity the acronym *IPA* continues to be used.
2. The IPA was originally a collection of information submitted by national authorities⁵ to provide a list of those substances whose sole function is that of a processing aid.
3. At its 21st session in 1989, Codex Committee on Food Additives and Contaminants (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.
4. 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.
5. 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.
6. CCFAC at its 36th Session recognized that the development of a positive list of processing aids was not a realistic approach at the present time due to a lack of resources. However, the value of the IPA itself, as a useful reference tool, has been recognized and agreed to maintain the IPA for the time being and decided that New Zealand would prepare updated versions of the IPA for consideration at sessions of the Committee.

INTRODUCTION

7. The Inventory is not intended to be complete or a "positive list" of permitted aids.
8. The Updated IPA includes:
 - Substances in the original list in CAC/MISC 3
 - Additions to the IPA agreed to by the Committee up to and including the 42nd session in March 2010.
9. Substances that may also function as food additives or foods are designated by an asterisk (*).

⁴ ALINORM 07/30/12 paragraph 133

⁵ ALINORM 89/12A, Appendix VIII.

Inventory of Substances used as Processing Aids (IPA), Main List

10. 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 Use - the foods or food processing procedures in which the processing aid is utilised.
- 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 – “Yes” indicates that the substance has been reviewed or considered by a JECFA. Note that JECFA consideration of a substance does not necessarily mean that JECFA has reviewed the processing aid use(s) of the substance, nor that JECFA assigned an ADI to the substance. Summary information is available on <http://jecfa.ilsi.org/search.cfm>
- JECFA specification – “Yes” indicates that there is a relevant monograph covering the identity and purity of the substance.
- ADI-the latest JECFA ADI in mg/kg body weight or other end point of their safety assessment. Abbreviations used in this column are :
 - NS for ADI “not specified”
 - NL for ADI “not limited”
 - DP for decision postponed
 - PTWI for provisional tolerable weekly intake
 - MTDI for maximum tolerable daily intake
- JECFA comments includes any relevant comments in respect to the ADI or in some cases the specification.
- References - this includes the references from which the original 1989 list was developed (ALINORM 98/12A Appendix VIII) plus a notation when new substances have been added.

11. **Appendix A catalogues substances that are used as processing aids but not included in the main inventory as they have functions also as food additives or foods.**

(Note that substances already covered in the main IPA were formerly listed and annotated as (1.). These have been have been deleted to avoid repetition.)⁶

⁶ CX/FAC 06/38/13.

Inventory of Substances used as Processing Aids (IPA), Main List

12. The substances are annotated according to the following system:

2. indicates those materials that are both food additives 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.
4. indicates those materials that might actually have simultaneous function as processing aids and functionality in the finished food.

(Appendix B of the earlier versions of the IPA has been deleted to avoid unnecessary duplication as it reproduces the Microbial Enzyme Preparation Section of the main Inventory.)⁷

13. The Committee recognises 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.

14. In general the list does not include substances used in the manufacture of food additives (but some substances used as solvents in the manufacture of flavourings and colourings are mentioned in the main list).

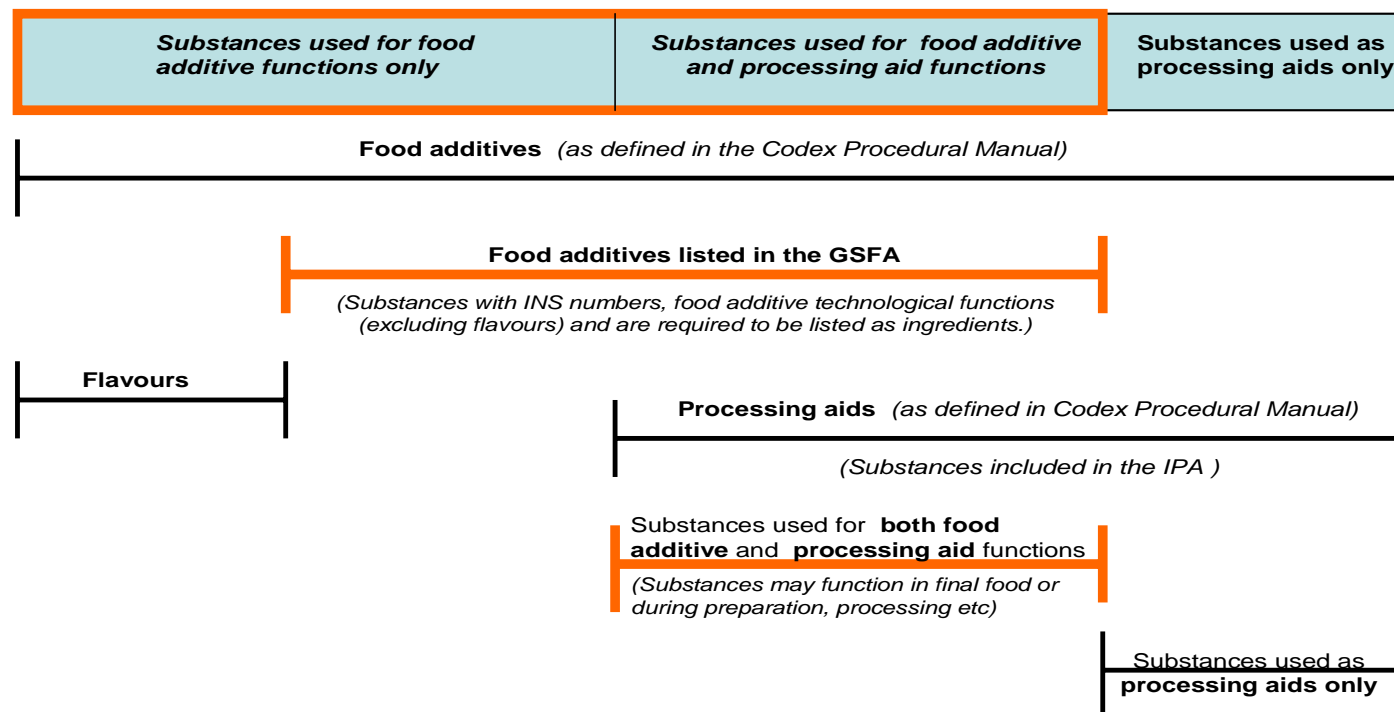
⁷ CX/FAC 06/38/13.

THE RELATIONSHIP BETWEEN FOOD ADDITIVES AND PROCESSING AIDS IN THE CODEX SYSTEM

The diagram below shows the relationship between food additives and substances used as processing aids. The diagram takes into account the *Codex Procedural Manual* definitions and the scope of the *General Standard for Food Additives (GSFA)* and the IPA. It is important to note that the term *food additive* as defined in the *Codex Procedural Manual*, includes substances used as processing aids, and that the GSFA does not include flavours or substances used only as processing aids or any processing aids functions of listed food additives.

Relationship between Food Additives and Processing Aids

(Not to scale)



INVENTORY OF SUBSTANCES USED AS PROCESSING AIDS (IPA)

Main List (updated for 43rd CCFA, March 2011)

IPA CATEGORIES

Antifoam Agents

Boiler water additives

Catalysts

Clarifying agents/ filtration,aids

Contact freezing & cooling agents

Desiccating agent/anticaking agents

Detergents (wetting agents)

Enzyme immobilization agents & supports

Flocculating agents

Ion exchange resins, membranes, and molecular sieves

Lubricants, release and anti stick agents, moulding aids

Micro-organism control agents

Propellant and packaging gases

Solvents, extraction & processing

Washing and Peeling agents

Other processing aids

Enzyme preparations (including immobilized enzymes)*

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Antifoam Agents								
Fatty acid methyl ester	Vegetable protein							31
Fatty acid polyalkylene glycol ester (1-5 moles ethylene oxide or propylene oxide)	Vegetable protein							31
Fatty alcohols (C8-C30)	Vegetable protein							
Formaldehyde	Sugar beet processing	< 0.05	None					39
	Yeast processing	< 0.05	None					
*Hydrogenated coconut oil	confectionery Vegetable protein	May-15						36, 49
Mixtures of polyoxyethylene and polyoxypropylene esters of C8-C30 fatty acids	Vegetable protein							31
*Mono- and diglycerides of fatty acids from feed fat (E471)	Jams, jellies and marmalades			Yes	Yes	Mono and diglycerides differ little from food therefore use NL	NL	CCFA 41 54 , CCFA42 (IFU)
Oxoalcohols (C9-C30)								31
*Polydimethylpolysiloxane (INS 900a)	Beer Fats and oils Vegetable protein, Juice making	10 (Frying/deep frying purposes only) 10		Yes	Yes	Evaluated as antifoaming agent, anticaking agent Temporary ADI of 0-0.8.	0-1.5	57 Fats and Oils CCFAC 22 CCFA 41 JECFA 69 CCFA 42 (IFU)
Polyoxyethylene esters of C8-C30 fatty acids	Vegetable protein							31

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Polyoxypropylene esters of C8-C30 fatty acids	Vegetable protein							31
Polyoxyethylene esters of C9-C30 oxoalcohols	Vegetable protein							31
Polyoxypropylene esters of C9-C30 oxoalcohols	Vegetable protein							31
<u>Boiler water additives</u>								
Acrylamide-sodium acrylate resin	boiler water							
*Ammonium alginate	boiler water			Yes	Yes	Group ADI for alginic acid and its ammonium, calcium, potassium and sodium salts	NS	CCFAC 22
Cobalt sulphate	boiler water							CCFAC 22
1-Hydroethylidene-1,1-diphosphoric acid and its sodium and potassium salts	boiler water							CCFAC 22
Lignosulfonic acid	boiler water							CCFAC 22
Magnesium sulfate	boiler water			Yes	Yes	Evaluated as Nutrient	NS	CCFAC 22
Monobutyl ethers of polyethylene-polypropylene glycol produced by random condensation of a 1:1 mixture by wt. Of ethylene oxide and propylene oxide with butanol	boiler water							CCFAC 22
*Pentasodium triphosphate	boiler water			Yes	Yes	Expressed as P from all sources	MTDI 70	CCFAC 22
Poly (actylic acid co-hypophosphite), Na salt	boiler water							CCFAC 22
*Polyethylene glycols	boiler water			Yes	Yes	Evaluated as Carrier solvent and Excipient	0-10	CCFAC 22
Polymaleic acid and/or its sodium salt	boiler water							CCFAC 22
Polyoxypropylene glycol	boiler water							CCFAC 22
*Potassium alginate	boiler water			Yes	Yes	Group ADI for aliginic salts Evaluated as stabiliser, thickener,	NS	CCFAC 22

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
						gelling agent and emulsifier		
*Potassium carbonate	boiler water			Yes	Yes		NL	CCFAC 22
*Potassium tripolyphosphate	boiler water			Yes	Yes	Expressed as P from all sources specification as texturiser	MTDI 70	CCFAC 22
*Sodium acetate	boiler water			Yes	Yes		NS	CCFAC 22
*Sodium alginate	boiler water			Yes	Yes	Group ADI for alginates	NS	CCFAC 22
Sodium aluminate	boiler water							CCFAC 22
*Sodium carbonate	boiler water			Yes	Yes		NL	CCFAC 22
*Sodium carboxymethyl cellulose	boiler water			Yes	Yes	Group ADI for modified celluloses	NS	CCFAC 22
Sodium glucoheptonate	boiler water							CCFAC 22
*Sodium hexametaphosphate	boiler water			Yes	Yes	Expressed as P from all sources Evaluated as emulsifier, sequestrant, texturizer	MTDI 70	CCFAC 22
Sodium humate	boiler water							CCFAC 22
*Sodium hydroxide	boiler water			Yes	Yes		NL	CCFAC 22
Sodium lignosulfonate	boiler water							CCFAC 22
*Sodium metasilicate	boiler water							CCFAC 22
*Sodium nitrate	boiler water			Yes	Add.3/173 as anti-microbial and colour tentative	Expressed as nitrate ion; (or 0-5 mg/kg bw expressed as sodium nitrate) Evaluated as antimicrobial preservative, colour fixative	0-3.7	CCFAC 22
*Sodium phosphate (mono-, di-, tri-)	boiler water			Yes	Yes. Specification withdrawn for tri form	Expressed as P from all sources	MTDI 70	CCFAC 22
Sodium polyacrylate	boiler water							
*Sodium polyphosphates	boiler water				See sodium hexa-meta phosphate			CCFAC 22

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Manganese	Hydrogenated food oils	<0.4						1, 22
Molybdenum	Hydrogenated food oils	< 0.1						1, 22
Nickel	Polyols	< 1						1, 36, 55
	Hardened oil manufacturing	< 0.8						6
	Hydrogenated food oils	0.2 to 1						22
Palladium	Hydrogenated food oils	< 0.1						1, 22
Platinum	Hydrogenated food oils	< 0.1						1, 22
Potassium metal	Interesterified food oils	< 1						1, 5, 22
Potassium methylate (methoxide)	Interesterified food oils	< 1						22
Potassium ethylate (ethoxide)	Interesterified food oils	< 1						1,22
Silver	Hydrogenated. food oils	< 0.1		Yes		No info on use in/on foods insufficient data to evaluate	DP	5,22
Sodium amide	Interesterified food oils	< 1						1,22
Sodium ethylene (sodium ethylate)	Interesterified food oils	< 1						1, 22, 57
Sodium metal	Interesterified food oils	< 1						1,22
Sodium methylate (methoxide)		<1						

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Trifluomethane sulfonic acid	Cocoa butter substitute	< 0.01	None					38
Various metal oxides	Hydrogenated food oils	< 0.1						5,22
Zirconium								16
Clarifying agents/ filtration aids								
Absorbent clays (bleaching, natural or activated earths)	Starch hydrolysis Sugars Edible vegetable oil, Juice making	GMP						61 CCFA 42 (IFU)
Absorbent resins	Juice making	GMP						CCFA 42 (IFU)
Activated carbon	Sugars Oils Juice making	GMP				Evaluated as a adsorbent, decolouring agent	NL	32,55 CCFAC 25 CCFA 42 (IFU)
*Albumin								1
Asbestos				Yes	-	Evaluated as contaminant. Concerns of carcinogen characteristics	No tolerable intake est.	6, 17,25
Bentonite	Starch hydrolysis Juice making	GMP		Yes		No info on use or impurities for JECFA to evaluate	No ADI allocated	1, 6, 37,39,49 CCFA42 (IFU)
Calcium hydroxide	Juice making	GMP (Grape juice only)						CCFA 42 (IFU)
*Calcium oxide	Sugar			Yes	Yes	Evaluated as Alkali, dough conditioner and yeast food		6, 15
Cellulose	Juice making	GMP						CCFA 42 (IFU)
Chitin/ Chitosan	Juice making	GMP						CCFAC 22, CCFA 42 (IFU)

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Polymaleic acid and sodium polymaleate	Sugar processing	< 5	None					58
Polyvinylpyrrolidone	Juice making	GMP						CCFA 42 (IFU)
Potassium caseinate	Juice making	GMP						CCFA 42 (IFU)
Potassium tartrate	Juice making (grape juice)	GMP in grape juice only						CCFA 42 (IFU)
Precipitated calcium carbonate	Juice making (grape juice)	GMP in grape juice only						CCFA 42 (IFU)
Rice hulls	Juice making	GMP						CCFA 42 (IFU)
Silicasol	Juice making	GMP						CCFA 42 (IFU)
Sodium caseinate	Juice making	GMP						CCFA 42 (IFU)
Sulfur dioxide	Juice making (grape juice)	10 as SO ₂ in grape juice only						CCFA 42 (IFU)
*Tannin (to be specified) Tannic Acid	Juice making	GMP		Yes	Yes	For use as filtering agent where GMP ensures it is removed from food after use.	NS	1, 6, CCFA 42 (IFU)
*Vegetable carbon (activated)	Starch hydrolysis			Yes	Yes	Evaluated as colour Also known as Carbon black	Not allocated	1, 6 23, 37 49,
Vegetable carbon (unactivated)								6
Contact freezing & cooling agents								
*Dichlorofluoromethane	frozen food	100						1
Freon (to be specified)								1
*Nitrogen				Yes	Yes	Packaging gas, cryogenic freezant, propellant	Not necessary, inert	1
Desiccating agent/anticaking agents								
Aluminum stearate				Yes	Yes	Evaluated as anion and cation	PTWI for Al 1 mg/kg bw NS for stearates	61

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Amorphous hydrophobic silica								CCFA 42 (Brooke-Taylor & Co Pty Ltd)
Calcium phosphate (tricalcium phosphate)				Yes	Yes	Expressed as P from all sources	MTDI 70	28
Calcium Stearate				Yes	Yes		Not allocated	61
Magnesium oxide	anticaking agent and neutralising agent			Yes	Yes	Evaluated as anticaking agent	NL	14
Magnesium stearate				Yes	Yes		Not allocated	61
Octadecyl ammonium acetate (in ammonium chloride)								28
Potassium aluminum silicate								
Sodium alumino silicate				Yes	Yes	Anticaking agent Group ADI for silicon dioxide and certain silicates.	NS	28
Sodium calcium silicoaluminate				Yes	Yes	Anticaking agent	NS	61
Detergents (wetting agents)								
*Dioctyl sodium sulfosuccinate	Fruit drinks	<10		Yes	Yes	Evaluated as emulsifier or wetting agent	0-0.1	26
Magnesium Sulphate	Fats and oils							CCFAC 25
Methyl glucoside of coconut oil ester	Molasses	320						26
Quaternary ammonium compounds								
Sodium lauryl sulphate	Food fats and oils	< 1						221 39
Sodium xylene sulphate	Food fats & oils	<1						

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Enzyme immobilization agents & supports								
Polyethylenimine (# ADI acceptable provided migration into food reduced to lowest technologically possible)				Yes	Yes	Evaluated as immobilizing agent. New method of analysis prepared at 29 th to ensure < 0.1 mg/kg in enzyme preparations of ethylenimine.	Suitable #	42
Glutaraldehyde								33
Glass		Starch hydrolysis						33,49
Diatomaceous earth				Yes	Yes	Evaluated as filter aid	DP	33
Ceramics	Starch hydrolysis							37, 49
Diethylaminoethyl Cellulose								14, 33,
Ion exchange resins								55
Flocculating agents								
Acrylate-acrylamide resin	Sugar	(10 in sugar liquor)						3,24,56
Chitin/Chitosan								CCFAC 22
Complexes of soluble aluminum salt and phosphoric acid	Drinking water							57
								32
Dimethylmine -epichlorohydrin copolymer	Sugar processing	< 5	None					58
Fuller's earth (calcium analogue of sodium montmorillonite)								32
*Isinglass				Yes	Yes	Evaluated as thickener, stabilizer and emulsifier	NL	

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Cross-linked polystyrene, first chloremethylated then aminated with trimethylamine, dimethylamine, diethylenetriamine or dimethylethanolamine.								3
Diethylenetriamine, triethylenetetramine, tetraethylenapentamine cross-linked with epichlorohydrin								3
Epichlorohydrin cross-linked with ammonia.								3
Epichlorohydrin cross-linked with ammonia and then quaternized with methyl chloride to contain tot more than 18 percent strong base capacity by weight of total exchange capacity	Water used in food processing	None						58
Methacrylic acid-divinylbenzene copolymer.								3
Methacrylic acid-divinylbenzene copolymer with RCOO active groups.								6
Methyl acrylate-divinylbenzene copolymer containing not less than 2 percent by weight of divinylbenzene, aminolyzed with dimethylaminopropylamine.								3
Methyl acrylate-divinylbenzene copolymer containing not less than 3.5 percent by weight of divinyl benzene, aminolyzed with dimethylaminopropylamine								3

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter- action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Methyl acrylate-divinylbenzenediethylene glycol divinyl either 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 dimethyl-aminopropylamine.								3
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.	Sugar processing	0.015 (extractives from resin)	None					58
Polystyrene- divinylbenzene reticulum with trimethylammonium groups.	Sugar, distilled liquors	Migrants from resin <1						17
Reaction resin of formaldehyde, acetone and tetraethylpentamine								3
Styrene-divinylbenzene cross-linked copolymer, first chlormethylated then animated with dimethylamine and oxidized with hydrogen peroxide whereby the resin contains not mor6 than 15 percent by weight of vinyl N,N-dimethyl-benzylamine-N-oxide,and not more than 6.5 percent by weight of nitrogen.								3

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Sulfite-modified cross-linked phenol-formaldehyde, with modification resulting in sulfonic acid groups on side chains								3
Sulfonated anthracite coal meeting the requirements of American society for Testing and Materials D388-38, Class 1, Group 2								
Sulfonated copolymer of styrene and divinylbenzene.								3
Sulfonated terpolymers of styrene, divinylbenzene and acrylonitrile. or methyl acrylate.								3
Sulfonated tetrapolymer of 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.								3
Counter ions for resins								3, 36
Aluminum								
Bicarbonate								
Calcium								
Carbonate								
Chloride								
Hydronium								
Hydroxyl								
Magnesium								
Potassium								
Sodium								
Strontium								

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter- action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Sulfate								
Membranes: Polyethylene - polystyrene base modified by reaction with chloramethyl ether and subsequent amination with trimethylamine, diethylenetriamine or dimethylethanolamine.								46

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter- action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Polymers and copolymers containing the following components: cellulose (such as cellulose diacetate, cellulose triacetate, cellulose ethers, cellulose), Polysulfone - sulfonated polyethersulfone, 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.								

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Polymers and copolymers containing the following components: celluloses (such as cellu-lose diacetate, cellulose triacetate, cellulose ethers, cellulose), Polysulfone - sulfonated polyethersulfone, Polyethersulfone - sulfonated polyethersulfone, Fluoropolymers (such as polyvinylidene fluoride, chlorotrifluoroethyl-ene-vinylidene fluoride copolymer, polytetra-fluoroethylene), Polysulfonamides, aliphatic/aromatic polyamide and copolyamides (such as polypiperazineamides, m-phenylene-diamine trimesamide polymer), Polyesters (such as polyethyleneterephalate), Polyolefins (such as polypropylene, polyethylene), Polya-mide - imide polymers, Polyimides, Polyacryl-onitriles, Polyvinylpyrrolidone, Polystyrene-sulonated polystyrene, chitin/chitosan and deri-vatives, polyureas - polyurethanes, Polyethers, and Polyamines.				29	Comp /265	Anticaking agent	NS	28

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Lubricants, release and anti stick agents, moulding aids								
Bentonite	Confectionery			Yes	Not prepared	Anticaking agent .No significant uses known, no data on impurities	No ADI allocated	2
*Dimethylpolysiloxane				Yes	Yes	ADI only applies to compounds with 200 – 300 subunits	0-1.5	16
Kaolin (Aluminum Silicate)	Confectionery			Yes	Yes	As anticaking agent	NS	2
Micro-organism control agents								
Acidified sodium chlorite (ASC)	Poultry Meats Vegetables Fruit Seafood	Chloride	None	Yes	Yes	The available toxicological data were sufficient to assess the safety of ASC by setting ADIs for chlorite and chlorate.	0.03 (chlorite) 0.01 (chlorate)	CCFA 40
*Chlorine dioxide #	Flour			Yes	Withdrawn (2000)	Flour treatment agent conditional, 30-75; acceptable level of treatment for flours to be consumed by man		57
*Dimethyl dicarbonate	Wine Beverages	None		Yes	Yes	Acceptable for use as a cold sterilization agent in beverages when used according to good manufacturing practice up to a maximum concentration of 250mg/l	acceptable	58 CCFA 40

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Formaldehyde	sugar							56
Hydrogen peroxide	Sugar, fruit and vegetable juices			Yes	Yes	Small residues of hydrogen peroxide on food (which has been treated with antimicrobial washing solutions) at the time of consumption would not pose a safety concern.		14,24 CCFA 42 (IFU)
Hypochlorite	Food oils							22
Iodophors	Food oils							22
Lactoperoxidase system (lactoperoxidase, glucose oxidase, thiocyanate salt)								47
Peracetic acid								
Peroxyacid antimicrobial solutions								CCFAC 38
Quaternary ammonium compounds	Food oils							22
Salts of sulfurous acid	Corn milling Starch hydrolysis	< 100						32,37,57
Sodium metasilicate (Sodium sulphate or sodium carbonate can be added to reduce silicate scaling on equipment)	Meat and poultry carcasses, half carcasses and cuts							CCFA 40
*Trisodium phosphate	Meat and poultry carcasses, half carcasses			Yes	Yes	Expressed as P from all sources	MTDI 70	CCFA 40

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
	and cuts							
Propellant and packaging gases								
*Air								45
Argon								45
*Carbon dioxide	Juice making	GMP						56, CCFA 42 (IFU))
Chloropentafluoroethane								1
Combustion product gas a variable mixture of gases produced by controlled combustion of butane, propane, or natural gas. The principle components are nitrogen and carbon dioxide,, with lesser amounts of hydrogen, oxygen, carbon monoxide (not to exceed 4.5%), any traces of other inert gases.								3,58
*Dichlorodifluoromethane (F 12)								56
*Helium								1
Hydrogen								
Isobutane	Propellent in vegetable oil pan spray (for professional use only)							CCFAC 37
*Nitrous oxide				Yes	Yes	At its twenty-ninth meeting (1985), the Committee concluded that use of nitrous oxide as a propellant for food was acceptable. At its fifty-fifth meeting (2000), the Committee	Use acceptable as a propellant	1, 6

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
						was requested by the CCFAC to evaluate the additional use of nitrous oxide as a packaging gas, but the Committee could not carry out this request because no information on intake of nitrous oxide for such use was available.		
*Nitrogen	Juice making	GMP		Yes	Yes	Packaging gas; cryogenic freezant, propellant	No ADI necessary	1,3,6 CCFA 42 (IFU))
Octafluorocyclobutane								1
Propane				Yes	Not prepared	Evaluated as propellant; extraction solvent	NS	1
Trichlorofluoromethane (F 11)								43.6
Solvents, extraction & processing.								
Acetone (Dimethyl ketone)	Flavourings, colours, food oils	< 30, 2, & 0.1		Yes	Yes	Extraction solvent, flavouring agent	Acceptable	1, 3, 4,17, 22, 14
Amyl acetate	Flavourings, colours			Yes	Yes	As carrier solvent, flavouring agent. Included in ADI for amyl butyrate expressed as isoamyl alcohol	0-3	2,59
Benzyl alcohol	Flavourings, colours, fatty acids			Yes	Yes	As carrier solvent, flavouring. ADI for total benzoate from all sources	0-5	2,59
*Butane	Flavourings, food oils	<1, 0.1		Yes	Not prepared	Propellant	Not allocated	1, 4, 17,22,19
Butane-1,3-diol	Flavorings	0-4		23	Comp/ 241	As carrier solvent	0-4	3
Butan-1-ol	Fatty acids flavourings, colours	<1000		Yes	Yes	Evaluated as extraction solvent, flavouring agent	Acceptable	2,4,19

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Butan-2-ol	Flavorings	1		Yes	Yes	Extraction solvent, flavour	Not allocated	56
*Butyl acetate				Yes	Yes	Evaluation as flavouring agent.	Acceptable	56
*Carbon dioxide				Yes	Yes	Carbonating agent, propellant, preservative, freezing agent, extraction solvent		56
Cyclohexane	Flavourings, food oils	< 1		Yes	Yes	Extraction solvent	Not allocated	4.17.19
Dibutyl ether	Flavourings	<2						4,19
1,2 Dichloroethane	Decaf. Coffee	< 5		Yes	Not prepared	Evidence of genotoxicity and carcinogenicity; should not be used in food	Not allocated	1, 17
Dichlorodifluoromethane	Flavourings, colour	< 1		Yes	Not prepared	Propellant; Liquid Freezant	0-1.5	2,4,19,59,
Dichloromethane (methylene chloride)	Flavourings, decaf. Coffee, food oils	< 2,5,10		Yes	Yes	Should be limited to current uses (extraction solvent)		2,4,17,22,19
Dichlorotetrafluoroethane	Flavourings	<1						4,19
Diethyl citrate	Flavourings, colours							2
Diethyl ether	Flavourings, colours	<2		Yes	Yes	Extraction solvent	Not allocated	2,4,19
Di- iso propoylketone								2
*Ethanol	Vegetable protein			Yes	Yes	Specification for extraction and carrier solvent	Limited by GMP	56
*Ethyl acetate				Yes	Yes	No safety concerns at current level of intakes when used as a flavouring agent	0-25	56

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Ethyl methyl ketone (butanone)	Fatty acids, flavourings, colour-ings. Decaffeination of coffee, tea	< 2		Yes	Yes	Extraction solvent, flavouring agent	Acceptable	2, 4, 19
Glycerol tributyrate	Flavourings, colours							2
Glycerol tripropionate	Flavourings, colours							2,59
Heptane	Flavourings, food oils	< 1		Yes	Yes	Extraction solvent	Limited by GMP	1, 4, 6,22
Hexane	Flavourings. food oils,	< 0.1		Yes	Yes	Extraction solvent	Limited by GMP	1,3,4,
						JECFA 65 recommended a re-evaluation of hexanes as there was insufficient information to change current specifications		
	Chocolate and chocolate products	1						CCFAC 37
*Isobutane	Flavourings	<1						4,19
Isoparaffinic petroleum hydrocarbons	Citric acid							3
Isopropyl myristate	Flavourings colours			Yes	Yes	Carrier solvent. No safety concerns at current level of intakes when used as a flavouring agent	Not allocated	2
Methylene chloride (dichloromethane)	Food oils	< 0.02		Yes	see above in dichloromethane			1,22
Methyl acetate	Coffee	20						56

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
	Decaffeination flavoring Sugar refining							
		1						
Methyl propanol-I	Flavorings	1						56
Nitrous oxide				Yes	Yes	evaluated as propellant Use acceptable as a propellant	acceptable	45
n-Octyl alcohol	Citric acid							3
Pentane	Flavourings, food oils	< 1						1,4, 22
Petroleum ether (light petroleum)	Flavourings, food oils	< 1		Yes	Yes	Extraction solvent	NS	1,4,6,22,19
*Propane	Flavourings, food oils	< 1, 0.1		Yes	Not prepared	Propellant; Extraction solvent Limited use and residue mean unnecessary to establish ADI	NS	4, 17,22,19
Propane-1,2-diol	Fatty acids flavourings, colours,							2,59
Propane-1-ol	Fatty acids, flavourings, colours			25	Comp/1205	Carrier/extraction solvent/ flavouring. Further tox studies required.	Not allocated	2,59
*Propylene Glycol				Yes	Yes	As solvent, humectant and glazing agent	0-25	CX/FAC 92/7
Tertiary butyl alcohol								38
1,1,2-Trichloroethylene	Flavourings, food oils	< 2		Yes	Withdrawn (2000)	Use as extraction solvent should be limited to ensure levels are as low as practicable	Not allocated	1,4,17,22, 19
Trichlorofluoromethane	Flavourings	<1						4,19,59
Tridodecylamine	Citric acid							3

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Toluene	Flavourings	<1		Yes	Yes	Residues of toluene occurring in food when this solvent is used in accordance with GMP would not pose any toxicological problems	NS	4, 19
Washing and peeling agents								
A mixture of alkene oxide adducts of alkyl alcohol and phosphate esters of alkylene oxide adducts of alkyl alcohols consisting of alpha-alkyl(C12-C18)-omega-hydroxy-poly(oxy-ethylene) (7.5-8.5moles) 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 (omega-hydroxy-poly(oxyethylene) (11.9-12.9 moles)/poly(oxypropylene) copolymer having an average molecular weight of 810 and sub-sequently esterified with 1.25 moles phosphoric anhydride	Fruits and vegetables	< 0.001 up to 0.01	None					3, 54
Alkylene oxide adducts of alkyl alcohols and fatty acids	Sugar beets	No Information Available						6,51,54
Aliphatic acid mixture consisting of valeric, caproic, enanthic, caprylic, and pelargonic acids	Fruits and vegetables	0.04-0-11	None					3,54

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Alpha-alkyl-omega-hydroxy-poly (oxyethylene)	Sugar beets	0.001 in sugar beets, 0 in sugar		None				3,51.54
Ammonium chloride, quaternary	Sugar beets							53
Ammonium orthophosphate	Fruits and vegetables			Yes	Yes	Expressed as P from all sources	MTDI 70	
*Calcium chloride	Fruits and vegetables			Yes	Yes	Firming agent	NL	53
*Calcium hydroxide	Sugar beets			Yes	Yes	Specification for neutralizing agent; buffer; firming agent	NL	53
*Calcium oxide	Sugar beets			Yes	Yes	Specification for Alkali, dough conditioner, yeast food	NL	53
Carbamate	Sugar beets							53
Dialkanolamine	sugar beets	0.001 in sugar beets, 0 in sugar	None					3,54
Diammonium orthophosphate	Fruits and vegetables for canning			Yes	Yes	Expressed as P from all sources	MTDI 70	
Diammonium orthophosphate, (5% aqueous solution)	Fruits and vegetables for canning			Yes	Yes	Expressed as P from all sources	MTDI 70	
Dithiocarbamate	Sugar beets							53
Ethylene dichloride	Sugar beets	0.00001 in sugar beets, 0 in sugar	None	23				3,54
Ethylene glycol monobutyl ether	Sugar beets	0.00003 in sugar beets, 0 in sugar	None					3,54

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Hydrogen peroxide		No Information - Available		Yes	Yes	As antimicrobial agent	Acceptable	54
Linear undecylbenzenesulfonic acid	Sugar beets	0.001 in sugar beets 0 in sugar	None					3,54
Monoethanolamine	Fruits and vegetables, sugar beets	100						3,52
Monoethanolamine	Sugar beets	0.0001 in sugar beets, 0 in sugar	None					54
Monoethanolamine (8%)	Fruits and vegetables for canning							56
Organophosphates	Sugar beets							53
Peroxyacid antimicrobial solutions containing 1-hydroxyethylidene-1,1-				Yes		The peroxy compounds in these solutions (hydrogen peroxide, peroxyacetic acid and peroxy-octanoic acid) would break down into acetic acid and octanoic acid, and small residual quantities of these acids on foods at the time of consumption would not pose a safety concern. HEDP does not pose a safety concern at the levels of residue that are expected to remain on foods at the time consumption.		
Diphosphonic acid (HEDP) <i>Containing HEDP and three or more of the following components: peroxyacetic acid, acetic acid, hydrogen peroxide, octanoic acid and peroxyoctanoic acid.</i>					Yes			
Acetic acid					Yes			
1-Hydroxyethylidene-1,1-diphosphonic acid (HEDP)					Yes			
Hydrogen peroxide					Yes			
Octanoic acid (as food additive)					Yes			

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Polyacrylamide	Fruits and vegetables, sugar beets	< 1	None					3,51,54
Potassium bromide	Fruits and vegetables							3,54
Sodium dodecylbenzenesulfonate (alkyl group predominantly C12 and not less than 95 percent C10-C16).	Fruits and vegetables, meat and poultry	< 2		None				3, 6, 54
Sodium 2-ethylhexyl sulphate	Fruits and vegetables	< 20		None				3,54
*Sodium carbonate				Yes	Yes	Alkali	NL	52
*Sodium hydroxide	Fruits and vegetables, sugar beets			Yes	Yes	Alkali	NL	53
Sodium hydroxide (10%, max.)	Fruits and vegetables for canning					See above		52
Sodium hydroxide (2%)	Mackerel for canning					See above		52
Sodium hypochlorite	Fruits and vegetables	No Information Available				No Information Available		3,52.54
Sodium mono- and di-methyl naphthalene-sulfonates (mol. wt. 245-260)	Fruits and vegetables	< 0.2	None					3, 54
Sodium n-alkylbenzenesulfonate (alkyl group predominantly C12 and C13 and not less than 95 percent C10-C16).	Fruits and vegetables	Same as sodium dodecylbenzenesulfonate	None					3, 6, 54

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (≤ less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
*Sulfuric acid	Locust bean seeds			Yes	Yes	As acid		CCFAC 25
Tetrapotassium pyrophosphate	Sugar beets	0.00002 in sugar beets	None	Yes	Yes	Specification as emulsifier, texturiser. MTDI for P from all sources	MTDI 70	3,54,57
		0 in sugar						
Tetrasodium ethylenediaminetetraacetate	Sugar beets	0.000003 in sugar beets	None					3,54
		0 in sugar						
Triethanolamine	Sugar beets	0.00005 in sugar beets	None					3, 54
		0 in sugar						
Other processing aids								
Aluminum oxide								
Aluminum potassium sulphate				Yes	Yes	Acidity Regulator; firming agent, raising agent Group ADI for Al	PTWI 1 mg/kg bw expressed as Al	28
Ammonium nitrate								
Benzoyl peroxide	Bleaching whey			Yes	Yes	Treatment of whey with benzoyl peroxide at a maximum	Acceptable	
						concentration of 100 mg/kg does not pose a safety concern.		
Beta – cyclodextrin	flavour adjunctor and cholesterol extraction in butter			Yes	Yes	As encapsulating agent for food additives, flavours and vitamins, thickening agent	0-5	CCFAC 25
*Erythorbic acid				Yes	Yes	Antioxidant	NS	58

Inventory of Substances used as Processing Aids (IPA), Main List

CATEGORY * These substances may also function as a food additive or foods	Use	Residues (mg/kg) (<= less than)	Inter-action with food	JECFA Eval.	Specifications	JECFA comments	ADI mg/kg bw	References
Propyl parahydroxybenzoate				Yes	Withdrawn (2006)	As preservative In view of the adverse effects in male rats, propyl paraben (propyl p-hydroxybenzoate) should be excluded from the group ADI for the parabens used in food.	Withdrawn (2006)	32,58
Sodium								
*Sodium Hydroxide	Fats and Oils			Yes	Yes	As alkali	NL	CCFAC 25
Sodium hypochlorite								
*Sodium silicate				Yes	Not prepared		NS	

ENZYME PREPARATIONS (INCLUDING IMMOBILIZED ENZYMES)

Microbially-derived enzymes from genetically modified organisms are listed with the producing host organism name followed by a d-(name) to identify the source of the donor organism gene.

Note: Due to taxonomic changes of many micro-organisms used to produce enzymes, it would be necessary to mention all the synonyms in each case. This would make the table quite unreadable and require regular updating. Therefore please consult the following list of taxonomic changes for the current correct names of specific micro-organisms that produce enzymes.

- *Aspergillus niger* covers strains known under the names *Aspergillus aculeatus*, *A. awamori*, *A. ficuum*, *A. foetidus*, *A. japonicus*, *A. phoenicis*, *A. saitoi*, *A. usamii* and *A. tubingensis*.
- *Bacillus subtilis* formerly also covered the strain now known under the name *Bacillus amyloliquefaciens*.
- ***Bacillus stearothermophilus* is also known as *Geobacillus stearothermophilus***
- *Endothia parasitica* is the former name of *Cryphonectrica parasitica*
- *Humicola lanuginosa* is also known as *Thermomyces lanuginosus*
- *Klebsiella aerogenes* is the former name of *Klebsiella pneumoniae*
- *Micrococcus lysodeicticus* is the former name of *Micrococcus luteus*
- *Mucor miehei* is the former name of *Rhizomucor miehei*
- *Penicillium emersonii* is the former name of *Talaromyces emersonii*. It is also known as *Geosmithia emersonii*
- *Rhizopus arrhizus* is the former name of *Rhizopus oryzae*.
- *Sporotrichum dimorphosporum* is the former name of *Disporotrichum dimorphosporum*
- *Streptoverticillium mobaraense* is the former name of *Streptomyces mobaraense*
- *Trichoderma reesei* is also known as *Trichoderma longibrachiatum*
- *Verticicladiella procera* is the former name of *Leptographium procerum*

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<u>Animal-Derived Enzyme Preparations:</u>				
Alpha amylase (hog or bovine pancreas)				10,23
Catalase (bovine or horse liver)	yes	yes	Use limited by GMP	1
Chymosin (calf or kid or lamb abomasum)				
<u>Chymotrypsin (bovine or porcine pancreas)</u>				
Lipase (bovine stomach) (salivary glands or fore stomach of calf, kid, or lamb) (hog or bovine pancreas)	yes	yes	Use limited by GMP	1, 3, 10,13
Lysozyme (egg whites)		yes	Regard as food/preservative	44, 48, 57
Pancreatin (bovine or porcine pancreas)				
Pepsin				
(hog stomach)	yes	yes	Limited by GMP	1
(proventricum of poultry)	yes	yes		41
(porcine pancreas)				55
Phospholipase A				
<i>(Bovine pancreas)</i>				CCFA 43 (AMFEP)
<i>(Porcine pancreas)</i>				CCFA 40 (CRD14 AMFEP)
Rennet				
(calf or kid, lamb stomach)	yes	yes	Limited by GMP	1
(bovine stomach)	yes	yes	Limited by GMP	
Trypsin (porcine or bovine pancreas)	yes	yes	Regard as food	1
<u>Plant-Derived Enzyme Preparations:</u>				
Alpha amylase (malted barley)				
Ascorbate oxidase (<i>Cucurbita pepo</i>)				CCFA 43 (AMFEP)
Beta amylase				
(malted or ungerminated barley)				
(soya)				
Bromelain (<i>Ananas comosus</i> ; <i>Ananas bracteatus</i>)	yes	yes	Limited by GMP	1
Chymopapain (<i>Carica papaya</i>)	yes	yes	Limited by GMP	
Ficin (<i>Ficus glabrata</i>)	yes	yes	Nonedible plant derived enzyme preparation. No toxicological data	1, 3

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
Laccase				
<i>(Trametes hirsuta)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trametes versicolour)</i>				CCFA 40 (CRD14 AMFEP)
Lipases (origin?)	yes	yes		CCFAC 25/ (1993) Malaysia
Lipase (<i>Carica papaya</i>)				CCFA 43 (AMFEP)
Lipoxydase (soya)				55
Malt carbohydrases (alpha or beta amylase) (malted barley or barley)	yes	yes	Limited by GMP	1, 6, 40,49,55
Papain (<i>Carica papaya</i>)	yes	yes	Limited by GMP	
Peroxidase (soya)				
Protease (incl. milk clotting enzymes) (<i>Actinidia chinensis</i>)				CCFA 40 (CRD14 AMFEP)
<u>Microbiologically derived Enzyme Preparations</u>				
Acetolactate decarboxylase <i>(Bacillus subtilis d-Bacillus brevis)</i>	yes	yes		
Acetolactate decarboxylase (alpha) <i>(Saccharomyces cerevisiae d-Enterobacter sp.)</i>				CCFA 40 (CRD14 AMFEP)
Acetylhexosaminidase, beta-L-N <i>(Streptomyces violaceoruber d-Streptomyces sp.)</i>				CCFA 43 (AMFEP)
Acid phosphatase (<i>Aspergillus niger</i>)				in CX/FAC 92/7
Alcohol dehydrogenase (<i>Saccharomyces cerevisiae</i>)				15
Alginate lyase <i>(Sphingobacterium multivorum)</i>				CCFA 43 (AMFEP)
Alpha amylase				
<i>(Aspergillus niger)</i>	yes	yes	Data required to show strains used do not produce mycotoxins	7
<i>(Aspergillus niger d-Aspergillus niger)</i>				
<i>(Aspergillus oryzae)</i>	yes	yes	Regard as normal constituent of food	7
<i>(Bacillus amyloliquefaciens)</i>				CX/FAC 92/7
<i>(Bacillus amyloliquefaciens d-Bacillus amyloliquefacien)</i>				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Bacillus amyloliquefaciens or subtilis d-Thermoactinomyces sp.)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus licheniformis)</i>				7
<i>(Bacillus licheniformis containing a modified alpha amylase gene from B. licheniformis)</i>	yes	yes		CCFAC 37
<i>(Bacillus licheniformis with modified gene from d-Geobacillus sp.)</i>				CCFA 43 (AMFEP)
<i>(Bacillus licheniformis d-Pseudomonas sp.)</i>				CCFA 43 (AMFEP)
<i>(Bacillus licheniformis d-Bacillus stearothermophilus)</i>				
<i>(Bacillus stearothermophilus)</i>	yes	yes		
<i>(Bacillus subtilis)</i>	yes	yes		7
<i>(Bacillus subtilis d-Bacillus megaterium)</i>	yes	yes		in CX/FAC 92/7
<i>(Bacillus subtilis d-Bacillus stearothermophilus)</i>	yes	yes		in CX/FAC 92/7
<i>(Bacillus subtilis d-Bacillus subtilis)</i>				
<i>(Microbacterium imperiale)</i>				
<i>(Pseudomonas fluorescens with modified gene from d-Thermococcus sp.)</i>				CCFA 43 (AMFEP)
<i>(Rhizopus delemar)</i>				7
<i>(Rhizopus oryzae)</i>				7
<i>(Thermomonospora viridis)</i>				
<i>(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)</i>				CCFA 43 (AMFEP)
Alpha galactosidase or Melibiase				7
<i>(Aspergillus niger)</i>	yes	yes	Evaluated as carbohydrase	
<i>(Aspergillus oryzae)</i>				
<i>(Aspergillus oryzae d-Aspergillus niger)</i>				
<i>(Mortierella vinacea)</i>				7
<i>(Saccharomyces carlsbergensis)</i>	yes	yes	Evaluated as carbohydrase	7,31
<i>(Saccharomyces cerevisiae d-Guar seed)</i>				
Aminoacylase (<i>Aspergillus melleus</i>)				CCFA 40 (CRD14 AMFEP)
Aminopeptidase				
<i>(Aspergillus niger)</i>				
<i>(Aspergillus oryzae)</i>				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Aspergillus oryzae d-Aspergillus sp.)</i>				CCFA 43 (AMFEP)
<i>(Lactococcus lactis)</i>				
<i>(Rhizopus oryzae)</i>				
<i>(Trichoderma reesei)</i>				
AMP deaminase)				
<i>(Aspergillus melleus)</i>				
<i>(Aspergillus oryzae)</i>				CCFA 43 (AMFEP)
Arabinanase (<i>Aspergillus niger</i>)				CCFA 40 (CRD14 AMFEP)
Arabinofuranosidase				CCFA 40 (CRD14 AMFEP)
<i>(Aspergillus niger)</i>	yes	yes	Evaluated as carbohydrase	31
<i>(Aspergillus niger d-Aspergillus niger)</i>				
Asparaginase				
<i>(Aspergillus niger d-Aspergillus niger.)</i>	yes	yes	ADI not specified when used under GMP	JECFA 69 CCFA 41
<i>(Aspergillus oryzae d-Aspergillus oryzae)</i>	yes	yes	ADI not specified when used under GMP in dough based and potato products prior to heating	AMFEP CRD14 JECFA 68 CCFA 40
<i>(Aspergillus niger d-Aspergillus niger)</i>	yes	yes	ADI not specified when used under GMP in bread and other cereal based products and baked and fried potato-based products prior to heating.	CCFA 41 JECFA 69
Beta amylase				
<i>(Bacillus cereus)</i>				7
<i>(Bacillus licheniformis)</i>				in CX/FAC 92/7
<i>(Bacillus megaterium)</i>				7, 8
<i>(Bacillus subtilis)</i>	yes	yes	As mixed microbial carbohydrases and proteases	7
Beta glucanase				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Aspergillus niger)</i>	yes	yes	Temporary acceptance of microbial carbohydrase pending further short term tests	
<i>(Bacillus amyloquefaciens)</i>				in CX/FAC 92/7
<i>(Bacillus amyloquefaciens d- Bacillus amyloquefaciens)</i>				
<i>(Bacillus subtilis)</i>	yes	yes		
<i>(Cellulosimicrobium cellucans)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Disporotrichum dimorphosporum)</i>				
<i>(Humicola insolens)</i>				
<i>(Penicillium funiculosum)</i>				
<i>(Penicillium multicolor)</i>				
<i>(Pseudomonas paucimobilis)</i>				
<i>(Talaromyces emersonii)</i>				
<i>(Trichoderma harzianum)</i>	yes	yes		20
<i>(Trichoderma reesei)</i>				in CX/FAC 92/7
<i>(Trichoderma reesei d-Trichoderma reesei)</i>				
Beta d-glucosidase or Cellobiase				
<i>(Aspergillus niger)</i>				7
<i>(Penicillium decumbens)</i>				
<i>(Penicillium multicolor)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trichoderma harzianum)</i>	yes	yes	As carbohydrases	
<i>(Trichoderma reesei)</i>				7, 20
<i>(Trichoderma reesei d-Trichoderma reesei)</i>				
Beta xylosidase (<i>Trichoderma reesei</i>)				55
Branching glycosyltransferase <i>(Bacillus subtilis d-Rhodothermus sp.)</i>				CCFA 43 (AMFEP) JECFA 71
Carbohydrases, mixed (pectinase, cellulases, and hemicellulases) (<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrases	CX/FAC 92/7
Carboxypeptidase <i>(Aspergillus niger d-Aspergillus niger)</i>				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
Catalase				
(<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrase	71.24,
(<i>Aspergillus niger d-Aspergillus niger</i>)				
(<i>Aspergillus oryzae</i>)				
(<i>Micrococcus luteus</i>)				7
Cellobiose dehydrogenase (<i>Fusarium venenatum d-Microdochium sp.</i>)				CCFA 40 (CRD14 AMFEP)
Cellulase				
(<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrase	6, 7,55
(<i>Aspergillus oryzae</i>)	ADI not decided	Withdrawn 2000	Evaluated as carbohydrase	7
(<i>Disporotrichum dimorphosporum</i>)				7
(<i>Humicola insolens</i>)				
(<i>Penicillium funiculosum</i>)				
(<i>Rhizopus delemar</i>)				7
(<i>Rhizopus oryzae</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Streptomyces lividans</i>)				
(<i>Talaromyces emersonii</i>)				
(<i>Thielavia terrestris</i>)				7
(<i>Trichoderma reesei</i>)	yes	yes		
(<i>Trichoderma reesei d-Trichoderma reesei</i>)				
(<i>Trichoderma viride</i>)				
Chitinase (<i>Streptomyces violaceoruber d-Streptomyces sp.</i>)				CCFA 43 (AMFEP)
Chymosin A (<i>E coli K-12 d-calf stomach</i>)	yes	yes		CCFAC 23 (1991)
Chymosin B				
(<i>Kluveromyces marxianus var. lactis d-calf stomach</i>)	yes	yes		CCFAC 23 (1991)
(<i>Aspergillus niger var. awamori d-calf stomach</i>)	yes	yes		CCFAC 23 (1991)
Cyclomaltodextrin glucanotransferase (<i>Bacillus licheniformis d-Thermoanaerobacter.</i>)				
Cyclomaltodextrin glucanotransferase (<i>Bacillus macerans</i>)				CCFA 40 (CRD14 AMFEP)
Dextranase				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Aspergillus ?)</i>				
<i>(Bacillus subtilis)</i>	yes	yes	Evaluated as mixed carbohydrases and proteases	
<i>(Chaetomium erraticum)</i>				
<i>(Chaetomium gracile)</i>				
<i>(Klebsiella pneumoniae)</i>				7
<i>(Leuconostoc mesenteroides)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Penicillium funiculosum)</i>				7
<i>(Penicillium lilacinum)</i>				7
Dextranucrase (<i>Leuconostoc mesenteroides</i>)				CCFA 43 (AMFEP)
Endo beta glucanase				
<i>(Aspergillus niger)</i>	yes	yes	Evaluated as carbohydrases	7
<i>(Aspergillus oryzae)</i>	yes	yes	Evaluated as carbohydrases	7
<i>(Bacillus circulans)</i>				7
<i>(Bacillus subtilis)</i>	yes	yes	Evaluated as mixed carbohydrases and protease	7
<i>(Disporotrichum dimorphosporum)</i>				56
<i>(Leuconostoc mesenteroides)</i>				CCFA 43 (AMFEP)
<i>(Rhizopus delemar)</i>				7
<i>(Rhizopus oryzae)</i>	yes	yes	Evaluated as carbohydrase	7, 30
<i>(Talaromyces emersonii)</i>				7
<i>(Trichoderma reesei)</i>				
Esterase				from CX/FAC 92/7
<i>(Aspergillus niger)</i>				55
<i>(Rhizomucor miehei)</i>				7
<i>(Trichoderma reesei)</i>				55
Exo alpha glucosidase (<i>Aspergillus niger</i>)				
Exo-alpha glucosidase (immobilized) (same source as above) no more than 10 mg/kg glutaraldehyde				
Ferulic acid esterase				
<i>(Aspergillus niger)</i>				CCFA 43 (AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Streptomyces werraensis)</i>				CCFA 40 (CRD14 AMFEP)
Fructosyl transferase				
<i>(Aspergillus niger)</i>				
Glucanase (endo-1,3(4)-beta) <i>Cellulosimicrobium sp.</i>)				CCFA 40 (CRD14 AMFEP)
Glucanase (beta) (<i>Aspergillus oryzae</i> d- <i>Thermoascus sp.</i>)				CCFA 40 (CRD14 AMFEP)
Glucoamylase or amyloglucosidase				
<i>(Aspergillus niger)</i>	yes	yes		7, 9, 16, 49, 50
<i>(Aspergillus niger</i> d- <i>Aspergillus niger)</i>				
<i>(Aspergillus niger</i> d- <i>Talaromyces emersonii)</i>				
<i>(Aspergillus oryzae)</i>	yes	yes	Microbial enzyme preparation	7
<i>(Penicillium funiculosum)</i>				
<i>(Rhizopus delemar)</i>				7
<i>(Rhizopus niveus)</i>				7
<i>(Rhizopus oryzae)</i>	yes	yes	Evaluated as carbohydrase	7
<i>(Trichoderma reesei)</i>				7, 30
<i>(Trichoderma reesei</i> or <i>longibrachiatum</i> d- <i>Trichoderma sp.</i>)				CCFA 43 (AMFEP)
<i>(Trichoderma reesei</i> or <i>longibrachiatum</i> with modified gene from d- <i>Trichoderma sp.</i>)				CCFA 43 (AMFEP)
Glucanotransferase <i>(Bacillus amyloliquefaciens</i> or <i>subtilis</i> d- <i>Thermus sp.</i>)				CCFA 43 (AMFEP)
Glucose isomerase				
<i>(Actinoplanes missouriensis)</i>	yes	yes	Acceptable for use in food processing when immobilised.	7
<i>(Arthrobacter?)</i>	15		Evaluated as carbohydrase	7
<i>(Bacillus coagulans)</i>	yes	yes	Non immobilised: No info on use No ADI allocated	7

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
			Immobilised: Use acceptable in food	
<i>(Microbacterium arborescens)</i>				
<i>(Streptomyces albus)</i>				7
<i>(Streptomyces lividans)</i>				
<i>(Streptomyces murinus)</i>				
<i>(Streptomyces olivaceus)</i>	yes	yes	acceptable when immobilised	7
<i>(Streptomyces olivochromogenes)</i>	yes	yes	acceptable when immobilised	12, 7
<i>(Streptomyces rubiginosus)</i>	yes	yes	acceptable when immobilised	9,20,21
<i>(Streptomyces rubiginosus d-Streptomyces sp.)</i>				CCFA 43 (AMFEP)
<i>(Streptomyces ?)</i>			See specific sp. above	17
<i>(Streptomyces violaceoniger)</i>	yes	yes		
Glucose isomerase (immobilized) .(same sources as above) not more than 10 mg/kg glutaraldehyde	yes	yes	See comments above	
<i>(Microbacterium arborescens)</i>				CX/FAC 92/7
<i>(Streptococcus murinus)</i>				CX/FAC 92/7
Glucose oxidase				
<i>(Aspergillus niger)</i>	yes	yes		1, 6, 7
<i>(Aspergillus niger d- Aspergillus niger)</i>				
<i>(Aspergillus oryzae d- Aspergillus niger)</i>				
<i>(Penicillium chrysogenum)</i>				
Glucosidase (exo-1.3-beta)				
<i>(Penicillium funiculosum)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trichoderma harzianum)</i>				CCFA 43 (AMFEP)
Glutaminase				
<i>(Aspergillus niger)</i>				CCFA 43 (AMFEP)
<i>(Bacillus subtilis)</i>				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
Glycerophospholipid cholesterol acyltransferase (<i>Bacillus licheniformis</i> d-<i>Aeromonas</i> sp.)				CCFA 43 (AMFEP)
Hemicellulase				
(<i>Aspergillus niger</i>)	yes	yes		
(<i>Aspergillus oryzae</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Bacillus lentus</i>)				
(<i>Bacillus subtilis</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Bacillus subtilis</i> d- <i>Bacillus</i> ?)				
(<i>Disporotrichum dimorphosporum</i>)				7
(<i>Rhizopus delemar</i>)				7
(<i>Rhizopus oryzae</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Trichoderma reesei</i>)				7,30
Hexose oxidase (<i>Hansenula polymorpha</i> d- <i>Chondrus crispus</i>)	yes	yes		CCFAC 38
Inulinase				
(<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrase	
(<i>Aspergillus oryzae</i> d- <i>Aspergillus</i> sp)				CCFA 41 (CRD12 AMFEP)
(<i>Disporotrichum dimorphosporum</i>)				
(<i>Kluyveromyces fragilis</i>)				7
(<i>Streptomyces</i> ?)	yes	yes		
Invertase				7
(<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrase	
(<i>Bacillus subtilis</i>)	yes	yes	Evaluated as carbohydrase	
(<i>Kluyveromyces fragilis</i>)				7
(<i>Saccharomyces carlsbergensis</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Saccharomyces cerevisiae</i>)	yes,	yes	Evaluated as carbohydrase	7, 17
(<i>Saccharomyces</i> ?)	yes	yes	Evaluated as carbohydrase	
Isoamylase				7
(<i>Bacillus cereus</i>)				
(<i>Pseudomonas amyloclavata</i>)	yes	yes	ADI not specified when used in applications as specified (starch processing)	CCFA 40

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
Laccase				
(<i>Aspergillus niger</i>)				CCFA 43 (AMFEP)
(<i>Aspergillus oryzae</i> d- <i>Myceliophthora thermophila</i>)	yes	yes		CCFAC 37
(<i>Aspergillus oryzae</i> d- <i>Polyporus</i> sp.)				CCFA 40 (CRD14 AMFEP)
(<i>Trichoderma reesei</i> or <i>longibrachiatum</i> d- <i>Thielavia</i> sp.)				CCFA 40 (CRD14 AMFEP)
Lactase or Beta galactosidase				
(<i>Aspergillus niger</i>)	yes	yes	Evaluated as carbohydrase	7
(<i>Aspergillus oryzae</i>)	yes	yes	Evaluated as carbohydrase	7,10
(<i>Aspergillus oryzae</i> d- <i>Aspergillus</i> sp)				CCFA 40 (CRD14 AMFEP)
(<i>Bacillus circulans</i>)				CCFA 40 (CRD14 AMFEP)
(<i>Candida pseudotropicalis</i>)				CX/FAC 92/7
(<i>Kluyveromyces fragilis</i>)				
(<i>Kluyveromyces lactis</i>)				
(<i>Kluyveromyces lactis</i> d- <i>Kluyveromyces lactis</i>)				
(<i>Saccharomyces species</i>)	yes	yes	Evaluated as carbohydrase	
Lactoperoxidase (Origin?)	yes	yes	under sodium percarbonate system for milk preservation	47,57
Lipase, monoacylglycerol (<i>Penicillium camembertii</i>)				CCFA 43 (AMFEP)
Lipase, triacylglycerol				
(<i>Aspergillus niger</i>)				7
(<i>Aspergillus niger</i> d- <i>Candida antarctica</i>)				
(<i>Aspergillus niger</i> d- <i>Fusarium</i> sp.)				CCFA 41 (CRD12 AMFEP)
(<i>Aspergillus oryzae</i>)	yes	Withdrawn 2000		1,7
(<i>Aspergillus oryzae</i> d- <i>Rhizomucor miehei</i>)				
(<i>Aspergillus oryzae</i> d- <i>Humicola lanuginosa</i>)				
(<i>Aspergillus oryzae</i> d- <i>Fusarium oxysporum</i>)				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Aspergillus oryzae d-Thermomyces sp.)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus licheniformis d-Aeromonas sp.)</i>				CCFA 43 (AMFEP)
<i>(Brevibacterium lineus)</i>				46
<i>(Candida lipolytica)</i>				7
<i>(Candida rugosa)</i>				
<i>(Mucor javanicus)</i>				7
<i>(Mucor pusillus)</i>				
<i>(Penicillium roqueforti)</i>				
<i>(Penicillium camembertii)</i>				
<i>(Pichia angusta or Hansenula polymorpha d-Fusarium sp.)</i>				CCFA 43 (AMFEP)
<i>(Rhizomucor miehei)</i>				7
<i>(Rhizopus nigrican)</i>				7
<i>(Rhizopus niveus)</i>				
<i>(Rhizopus oryzae)</i>				
Lipoxygenase (<i>Escherichia coli d-Pea</i>)				CCFA 40 (CRD14 AMFEP)
Lysophospholipase				23
<i>(Aspergillus niger)</i>				
<i>(Aspergillus niger d-Aspergillus niger)</i>				
Malic acid decarboxylase (<i>Leuconostoc oenos</i>)				7
Maltase or alpha glucosidase				
<i>(Aspergillus niger)</i>	yes	yes		7
<i>(Aspergillus oryzae)</i>	yes	Yes		7
<i>(Rhizopus oryzae)</i>	yes	yes	Evaluated as carbohydrase	7
<i>(Trichoderma reesei)</i>				
Maltogenic amylase (<i>Bacillus subtilis d-Bacillus stearothermophilus</i>)	yes	yes		CX/FAC 92/7
Mannanase (endo-1.4-beta)				
<i>(Aspergillus niger)</i>				CCFA 40 (CRD14 AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)</i>				CCFA 40 (CRD14 AMFEP)
Mixed xylanase, beta glucanase enzyme preparation <i>(Humicola insolens)</i>	yes			CCFAC 37
Nitrate reductase <i>(Micrococcus violagabriella)</i>				46
Pectate lyase (Bacillus subtilis)				CCFA 43 (AMFEP)
Pectinase or polygalacturonase				
<i>(Aspergillus niger)</i>	yes	yes		6, 7
<i>(Aspergillus niger d-Aspergillus niger)</i>				
<i>(Aspergillus oryzae)</i>	yes	yes	Evaluated as carbohydrase	6, 7
<i>(Aspergillus oryzae d-Aspergillus niger var. aculeatus)</i>				
<i>(Penicillium funiculosum)</i>				
<i>(Penicillium simplicissium)</i>				7
<i>(Rhizopus oryzae)</i>	yes	yes	Evaluated as carbohydrase	7
<i>(Trichoderma reesei)</i>				7, 30
<i>(Trichoderma reesei d-Aspergillus ?)</i>				
Pectin esterase				
<i>(Aspergillus niger)</i>				
Pectin lyase				
<i>(Aspergillus niger)</i>	yes	yes	Evaluated as carbohydrase	20
<i>(Aspergillus niger d-Aspergillus sp.)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Aspergillus sojae)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Penicillium funiculosum)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Rhizopus oryzae or arrhizus)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)</i>				CCFA 40 (CRD14 AMFEP)
Pectin methylesterase or Pectinesterase				
<i>(Aspergillus niger)</i>	yes	yes	Evaluated as carbohydrase	20
<i>(Aspergillus oryzae d-Aspergillus sp.)</i>				CCFA 43 (AMFEP)
<i>(Aspergillus sojae sp.)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Penicillium funiculosum)</i>				CCFA 40 (CRD14 AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Rhizopus oryzae or arrhizus)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)</i>				CCFA 40 (CRD14 AMFEP)
Pentosanase				
<i>(Aspergillus niger)</i>				CCFA 43 (AMFEP)
<i>(Bacillus amyloliquefaciens or subtilis)</i>				CCFA 43 (AMFEP)
<i>(Bacillus amyloliquefaciens or subtilis d-Bacillus sp.)</i>				CCFA 43 (AMFEP)
<i>(Humicola insolens)</i>				CCFA 43 (AMFEP)
<i>(Trichoderma reesei or longibrachiatum)</i>				CCFA 43 (AMFEP)
Peroxidase				CCFA 43 (AMFEP)
<i>Aspergillus niger d-Marasmius scorodoni</i>				
Phosphodiesterase				
<i>(Leptographium procerum)</i>				
<i>(Penicillium citrinum)</i>				
Phospholipase A				
<i>(Aspergillus niger)</i>				CCFA 43 (AMFEP)
<i>(Aspergillus niger d-Aspergillus sp)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Streptomyces violaceoruber d-Streptomyces sp.)</i>				CCFA 43 (AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Aspergillus)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Thermomyces sp.)</i>				CCFA 40 (CRD14 AMFEP)
Phospholipase A1 <i>(Aspergillus oryzae d-Fusarium venenatum)</i>	yes	yes	ADI not specified when used in applications as specified in accordance with good manufacturing practice)	CCFA 40
Phospholipase A2				
<i>(Aspergillus niger d-porcine pancreas)</i>				
<i>(Streptomyces chromofuscus)</i>				
<i>(Streptomyces violaceoruber)</i>				
Phospholipase B				
<i>(Aspergillus niger)</i>				CCFA 43 (AMFEP)
<i>(Aspergillus niger d-Aspergillus sp.)</i>				CCFA 43 (AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
(<i>Trichoderma reesei</i> or <i>longibrachiatum</i> d- <i>Aspergillus</i> sp.)				CCFA 40 (CRD14 AMFEP)
Phospholipase C expressed in <i>Pichia pastoris</i>	yes	yes	ADI not specified when used in applications as specified in accordance with good manufacturing practice)	CCFA 41 JECFA 69
Phospholipase D (<i>Streptomyces cinnamoneus</i>)				CCFA 43 (AMFEP)
Phytase				CX/FAC 92/7
(<i>Aspergillus niger</i>)				
(<i>Aspergillus niger</i> d- <i>Aspergillus niger</i>)				
(<i>Aspergillus oryzae</i> d- <i>Peniophora lycii</i>)				
(<i>Trichoderma reesei</i> d- <i>Aspergillus</i> ?)				
(<i>Aspergillus niger</i> d- <i>Aspergillus niger</i>)				
Polygalacturonase or Pectinase (<i>Aspergillus pulverulentus</i>)				CCFA 40 (CRD14 AMFEP)
Protease (including milk clotting enzymes)				
(<i>Aspergillus melleus</i>)				7
(<i>Aspergillus niger</i>)	yes	Not prepared		7
(<i>Aspergillus niger</i> d- <i>Aspergillus niger</i>)				
(<i>Aspergillus niger</i> d-Camel stomach)				CCFA 43 (AMFEP)
(<i>Aspergillus oryzae</i>)	yes	yes		7
(<i>Aspergillus oryzae</i> d- <i>Rhizomucor miehei</i>)				
(<i>Aspergillus sojae</i>)				CCFA 40 (CRD14 AMFEP)
(<i>Aspergillus sojae</i> d-<i>Aspergillus</i> sp.)				CCFA 43 (AMFEP)
(<i>Bacillus amyloliquefaciens</i>)				
(<i>Bacillus amyloliquefaciens</i> d- <i>Bacillus amyloliquefaciens</i>)				
(<i>Bacillus cereus</i>)				7
(<i>Bacillus clausii</i>)				CCFA 43 (AMFEP)
(<i>Bacillus licheniformis</i>)				7
(<i>Bacillus licheniformis</i> d- <i>Bacillus</i> sp.)				CCFA 40 (CRD14 AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Bacillus licheniformis d-Nocardiopsis sp.)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Bacillus stearothermophilus)</i>				
<i>(Bacillus subtilis)</i>	yes	yes	Evaluated as mixed carbohydrases and proteases	1,7
<i>(Bacillus subtilis d-Bacillus amyloliquefaciens)</i>				
<i>(Bacillus subtilis d-Thermus sp.)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Bacillus thermoproteolyticus)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Brevibacterium lineus)</i>				46
<i>(Endothia parasitica)</i> -rennet from	yes	Withdrawn 2000		1,7
<i>(Endothia parasitica d-Endothia parasitica)</i>				
<i>(Fusarium venenatum d- Fusarium sp.)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Geobacillus caldoproteolyticus)</i>				CCFA 43 (AMFEP)
<i>(Lactobacillus casei)</i>				46
<i>(Micrococcus caseolyticus)</i>				56
<i>(Mucor pusillus)</i> -rennet from	yes	yes		1,7
<i>(Penicillium citrinum)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Rhizomucor miehei)</i> -rennet from	yes	yes		1,7
<i>(Rhizopus niveus)</i>				
<i>(Rhizopus oryzae)</i>				
<i>(Streptococcus cremoris)</i>				46
<i>(Streptococcus lactis)</i>				
<i>(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)</i>				CCFA 43 (AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Bos Taurus)</i>				CCFA 43 (AMFEP)
Protein-glutaminase (<i>Chryseobacterium proteolyticum</i>)				CCFA 40 (CRD14 AMFEP)
Pullulanase				CX/FAC 92/7
<i>(Bacillus acidopullulyticus)</i>				30, 20
<i>(Bacillus brevis)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus circulans)</i>				
<i>(Bacillus licheniformis d-Bacillus deramificans)</i>				

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
<i>(Bacillus naganensis)</i>				
<i>(Bacillus subtilis)</i>				48, 49
<i>(Bacillus subtilis d-Bacillus acidopullulyticus)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus subtilis d-Bacillus naganensis)</i>				
<i>(Bacillus subtilis d-Bacillus deramificans)</i>				
<i>(Klebsiella aerogenes)</i>	yes	yes		7
<i>(Klebsiella planticola)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Klebsiella planticola d-Bacillus planticola)</i>				
<i>(Trichoderma reesei or longibrachiatum d-Hormoconis sp.)</i>				CCFA 40 (CRD14 AMFEP)
Rhamnosidase				
<i>(Penicillium decumbens)</i>				
<i>(Penicillium multicolor)</i>				CCFA 40 (CRD14 AMFEP)
Serine proteinase				
<i>(Bacillus amyloliqu- efaciens)</i>				CX/FAC 92/7
<i>(Bacillus licheniformis)</i>				
<i>(Bacillus subtilis)</i>				CX/FAC 92/7
<i>(Streptomyces fradiae)</i>			Insufficient toxicological data available	23
Sulfhydryl oxidase <i>Bacillus subtilis d-Saccharomyces sp.)</i>				CCFA 40 (CRD14 AMFEP)
Tannase				
<i>(Aspergillus niger)</i>				7
<i>(Aspergillus oryzae)</i>				7
Transglucosidase				
<i>(Aspergillus niger)</i>				
<i>(Trichoderma reesei or longibrachiatum d-Aspergillus sp.)</i>				CCFA 43 (AMFEP)
<i>(Trichoderma reesei or longibrachiatum d-Trichoderma sp.)</i>				CCFA 43 (AMFEP)
Urease (<i>Lactobacillus fermentum</i>)				
Xaa-Pro-dipeptidyl-aminopeptidase (<i>Lactococcus lactis</i>)				CCFA 40 (CRD14 AMFEP)

Inventory of Processing Aids (IPA) – Enzyme Preparations

CATEGORY	JECFA Eval.	Specifications	JECFA comments	References
Xylanase				
<i>(Aspergillus niger)</i>				7
<i>(Aspergillus niger d-Aspergillus niger)</i>				
<i>(Aspergillus oryzae d-Aspergillus niger var. aculeatus)</i>				
<i>(Aspergillus oryzae d-Humicola lanuginosa)</i>				
<i>(Aspergillus oryzae d-Thermomyces sp.)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus amyloliquefaciens or subtilis)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Bacillus licheniformis d-Bacillus licheniformis)</i>				
<i>(Bacillus subtilis d-Bacillus subtilis)</i>	yes	yes		CCFAC 38
<i>(Bacillus subtilis with modified gene from d-Bacillus subtilis)</i>	yes	yes		CCFAC 38
<i>(Bacillus subtilis d-Pseudoalteromonas sp.)</i>				CCFA 41 (CRD12 AMFEP)
<i>(Disporotrichum dimorphosporum)</i>				7
<i>(Fusarium venenatum d-Humicola lanuginosa)</i>	61			CCFAC 37
<i>(Humicola insolens)</i>				
<i>(Penicillium funiculosum)</i>				CCFA 40 (CRD14 AMFEP)
<i>(Streptomyces ?)</i>				7
<i>(Talaromyces emersonii)</i>				CCFA 43 (AMFEP)
<i>(Trichoderma reesei)</i>				48
<i>(Trichoderma reesei d-Trichoderma reesei)</i>				
<i>(Trichoderma viride)</i>				CCFA 40 (CRD14 AMFEP)

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3. USA, letter (Witcher/Feberwee), 14.10.80
4. IOFI, letter (Grundschober/Ronk), 8.7-81.
5. Codex Committee Fats and oils, letter (Burt/Rank), 16.7.81.
6. Hungary, letter (Suto/Ronk), 10.8.81.
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30. AMFEP, letter (Mahler/Prunier), 2.1.84.
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- 52- France, letter. (Martin/Ronk), 23.11.87.
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Inventory of Substances used as Processing Aids (IPA), Updated List

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APPENDIX A

CODEX INVENTORY OF COMPOUNDS USED AS PROCESSING AIDS WHICH ALSO SERVE OTHER FUNCTIONS

(excludes those substances already covered in the main IPA which were formerly annotated as (1.))

The substances are annotated according to the following system:

2. indicates those materials that are both food additives 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.
4. indicates those materials that might actually have simultaneous function as processing aids and functionality in the finished food.

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
- (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
- (2) Oxystearin
- (2) Petroleum wax
- (2) Petroleum wax (synthetic)
- (2) Petrolatum
- (2) Polyacrylic acid, sodium salt
- (2) Polydimethylpolysiloxane (fruit juices at 10mg/kg CCFAC 37)
- (2) Polyethylene glycol
- (2) Polyethylene glycol (400) dioleate
- (2) Polyethylene glycol (600) dioleate
- (2) Polyglycerol esters of fatty acids
- (2) Polyoxyethylene 40 monostearate
- (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

Appendix A

- (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

- (2) Ammonia
- (2) Ammonium bisulfite
- (2) Calcium chloride
- (2) Ferrous sulfate
- (2) Sodium chloride
- (2) Sodium hydroxide
- (2) Sodium metabisulfite
- (2) Sulfur dioxide

Clarifying agents/filtration aids

- (2) Acacia
- (2) Agar
- (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)
- (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
- (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
- (2) Glycerol

Desiccating agent/anticaking agents

- Aluminum stearate
- (2) Calcium aluminum silicate
- (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
- (2) Silicon dioxide
- (2) Silicon dioxide amorphous - silica gel
- (2) Sodium aluminum silicate
Sodium calcium silicoaluminate
- (2) Tricalcium diorthophosphate

Enzyme immobilization agents and supports

- (2) Carrageenan (including Furcelleran)
- (2) Gelatin
- (2) Sodium alginate

Solvents (extraction and processing)

- (2) Ammonia in methanol/ethanol
- (2) Benzyl benzoate
- (2) Butan-2-ol
- (2) Butyl acetate
- (2) Carbon dioxide
- (2) Castor oil
- (2) Diethyl tartrate
- (2) Ethanol
- (2) Ethyl acetate
- (2) Ethyl lactate
- (2) Glycerol
- (2) Glycerol mono- di- and triacetate
Isobutanol (2-methylpropan-1-ol)
- (2) Isopropyl alcohol
- (2) Methanol
- (2) Methyl acetate
Methyl propanol-1
- (2) Nitric acid
- (2) Propane-2-ol (isopropyl alcohol)

Trichlorofluoromethane

(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

- (2) Aluminum ammonium sulfate
- (2) Aluminum sulfate
- (2) Citric acid
- Dimethylamine-epichlorohydrin copolymer
- (2) Gelatin
- (2) Polyacrylic acid, sodium salt
- (2) Silica
- (2) Sodium alginate

Lubricants, release and anti-stick agents, moulding aids

Acetic acid esters of fatty acid mono- and diglycerides

- (2) Acetylated monoglycerides
- (2) Beeswax
- (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
- (2) Edible bone phosphate
- (2) Ethoxylated mono- and diglycerides
- (2) Fats and waxes of vegetable and animal origin
- (2) Fatty acids of tallow and vegetable oils
- (2) Hydrogenated sperm oil
- (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
- (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

- (3) Disodium cyanodithioamidocarbonate
- Disodium ethylene bis dithiocarbamate
- Dimethyldicarbonate
- (3) Ethylenediamine
- (3) N-alkyl (C12-C16) dimethyl benzylchloride
- (2) Natamycin
- (2) Nitric acid
- (3) Potassium N-methyldithiocarbamate
- (3) Propylene oxide
- (3) Sodium chlorite
- Sodium dimethyldithiocarbamate
- (2) Sulfur dioxide

Propellant and packaging gases

- (2) Carbon dioxide
- (2) Dichlorodifluoromethane
- (2) Oxygen

Washing and peeling agents

- (2) Ammonium chloride
- Ammonium orthophosphate
- (2) Calcium chloride
- (2) Calcium hydroxide
- (2) Calcium oxide
- Diammonium orthophosphate
- Dithiocarbamate
- (2) Oleic acid
- Organophosphates

Appendix A

- (2) Sodium carbonate
- (2) Sodium hydroxide
- (2) Sodium hydroxide, 10%
- (2) Sodium hydroxide, 2%
- (2) Sodium tripolyphosphate
- (2) Sulfuric acid

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
- (2) Ammonium bicarbonate
- (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
- Ethylene oxide-propylene oxide copolymers
- (2) Fatty acids of soybean oil
- Fatty alcohol-glycol ether
- (2) Fractionated soybean oil
- (2) Fumaric acid
- (2) Glycerol tripropionate
- (2) Glycine
- (2) Hydrochloric acid
- (2) Hydrogenated soybean oil
- Hydrophillic 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
- 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
- (2) Polyvinylpyrrolidone
- (2) Potassium carbonate
- (2) Potassium chloride
- (2) Potassium citrate

Appendix A

- (2) Potassium nitrate
- (2) Potassium phosphates
- (2) Potassium sulfate
- (2) Potassium tartrate
- (2) Propyl gallate
- (2) Propan-1-ol
- (2) Propane-1,2-diol
- (2) Shellac
- (2) Sandarac gum
- (2) Sodium chloride
- (2) Sodium aluminosilicate
- (2) Sodium bisulfite
- (2) Sodium bicarbonate
- (2) Sodium carbonate
- (2) Sodium citrate
- (2) Sodium hexametaphosphate
- (2) Sodium hydroxide
- (2) Sodium metabisulfite
- (2) Sodium phosphate monobasic
- (2) Sodium phosphate dibasic
- (2) Sodium phosphate tribasic
- Sodium polyacrylate
- Sodium polyacrylate-acrylamide resin
- (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 (hydrophillic)
- (2) Xylose