Standard 1.3.3

Processing Aids

Purpose

This Standard regulates the use of processing aids in food manufacture, prohibiting their use in food unless there is a specific permission within this Standard.

Standard 1.3.1 regulates the use of food additives.

Table of Provisions

Clauses

1 Interpretation

In this Standard-

EC [number] (Enzyme Commission number) means the number which the Enzyme Commission uses to classify the principal enzyme activity.

GMP means Good Manufacturing Practice.

maximum permitted level means the maximum amount of the processing aid which may be present in the food as specified in the Schedule.

processing aid means a substance listed in clauses 3 to 18, where –

(a) the substance is used in the processing of raw materials, foods or ingredients, to fulfil a technological purpose relating to treatment or processing, but does not perform a technological function in the final food; and

(b) the substance is used in the course of manufacture of a food at the lowest level necessary to achieve a function in the processing of that food, irrespective of any maximum permitted level specified.

2 General prohibition on the use of processing aids

Unless expressly permitted in this Standard, processing aids must not be added to food.

3 Generally permitted processing aids

The following processing aids may be used in the course of manufacture of any food at a level necessary to achieve a function in the processing of that food –

(a) foods, including water; and
(b) food additives listed in Schedule 2 of Standard 1.3.1; and
(c) a processing aid specified in the Table to this clause.

Table to clause 3

Activated carbon
Aluminium stearate
Ammonia
Ammonium chloride
Ammonium hydroxide
Bone phosphate
Calcium stearate
Carbon monoxide
Diatomaceous earth
Ethoxylated fatty alcohols
Ethyl alcohol
Fatty acid polyalkylene glycol ester

Furcellaran
Hydrogenated glucose syrups
Isopropyl alcohol
Kaolin
Magnesium hydroxide
Magnesium stearate
Oleic acid
Oleyl oleate
Oxygen
Perlite
Phospholipids
Phosphoric acid
Polyethylene glycols
Polyglycerol esters of fatty acids
Polyglycerol esters of interesterified ricinoleic acid
Polyoxyethylene 40 monostearate
Polypropylene glycol alginate
Potassium hydrogen tartrate
Potassium hydroxide
Potassium oleate
Potassium stearate
Silicates
Sodium ethoxide
Sodium hydroxide
Sodium lauryl sulphate
Sodium methoxide
Sulphuric acid
Tannic acid
White mineral oil

Editorial note:

'Silicates' include, but are not limited to, calcium aluminium silicate, calcium silicate, magnesium silicate, sodium aluminosilicate, sodium calcium polyphosphate silicate, sodium hexafluorosilicate, sodium metasilicate and sodium silicate.

4 Permitted antifoam agents

The processing aids listed in the Table to this clause may be used as an antifoam agent in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 4

Substance	Maximum permitted level (mg/kg)
Butanol	10
Dimethylpolysiloxane	10
Methylphenylpolysiloxane	10
Oxystearin	GMP
Polyethylene glycol dioleate	GMP
Polyethylene/ polypropylene glycol copolymers	GMP
Polysorbate 60	GMP
Polysorbate 65	GMP
Polysorbate 80	GMP
Soap	GMP
Sorbitan monolaurate	1
Sorbitan monooleate	1

5 Permitted catalysts

The processing aids listed in the Table to this clause may be used as a catalyst in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 5

Substance	Maximum permitted level (mg/kg)
Chromium	0.1
Copper	0.1
Molybdenum	0.1
Nickel	1.0
Peracetic acid	0.7
Potassium ethoxide	1.0
Potassium (metal)	GMP
Sodium (metal)	GMP

6 Permitted decolourants, clarifying and filtration agents

The processing aids listed in the Table to this clause may be used as decolourants, clarifying and filtration agents in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 6

Substance	Maximum permitted level (mg/kg)
Acid clays of montmorillonite	GMP
Chloromethylated aminated styrene-divinylbenzene resin	GMP
Copper sulphate	GMP
Dimethylamine-epichlorohydrin copolymer	150
Dimethyldialkylammonium chloride	GMP
Divinylbenzene copolymer	GMP
High density polyethylene co-extruded with kaolin	GMP
Iron oxide	GMP
Fish collagen, including Isinglass	GMP
Magnesium oxide	GMP
Modified polyacrylamide resins	GMP
Nylon	GMP
Phytates (including phytic acid, magnesium phytate & calcium phytate)	GMP
Polyester resins, cross-linked	GMP
Polyethylene	GMP
Polypropylene	GMP
Polyvinyl polypyrrolidone	100
Potassium ferrocyanide	0.1

7 Permitted desiccating preparations

The processing aids listed in the Table to this clause may be used as desiccating preparations in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 7

Substance	Maximum permitted level (mg/kg)
Aluminium sulphate	GMP
Ethyl esters of fatty acids	GMP
Short chain triglycerides	GMP
Sodium stearoyl lactylate	GMP

8 Permitted ion exchange resins

The processing aids listed in the Table to this clause may be used as an ion exchange resin in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 8

Substance	Maximum permitted level (mg/kg)
Completely hydrolysed copolymers of methyl acrylate and divinylbenzene	GMP
Completely hydrolysed terpolymers of methyl acrylate, divinylbenzene and acrylonitrile	GMP
Cross-linked phenol-formaldehyde activated with one or both of the following: triethylene tetramine and tetraethylenepentamine	GMP
Cross-linked polystyrene, chloromethylated, then aminated with trimethylamine, dimethylamine, diethylenetriamine, or dimethylethanolamine	GMP
Diethylenetriamine, triethylene-tetramine, or tetraethylenepentamin cross-linked with epichlorohydrin	GMP
Divinylbenzene copolymer	GMP
Epichlorohydrin cross-linked with ammonia	GMP
Epichlorohydrin cross-linked with ammonia and then quaternised with methyl chloride to contain not more than 18% strong base capacity by weight of total exchange capacity	GMP
Hydrolysed copolymer of methyl acrylate and divinylbenzene	GMP
Methacrylic acid-divinylbenzene copolymer	GMP
Methyl acrylate-divinylbenzene copolymer containing not less than 2% by weight of divinylbenzene, aminolysed with dimethylaminopro-pylamine	GMP
Methyl acrylate-divinylbenzene copolymer containing not less than 3.5% by weight of divinylbenzene, aminolysed with dimethylaminopro-pylamine	GMP

Methyl acrylate-divinylbenzene-diethylene glycol divinyl ether terpolymer containing not less than 3.5% by weight divinylbenzene and not more than 0.6% by weight of diethylene glycol divinyl ether, aminolysed with dimethaminopropylamine	GMP
Methyl acrylate-divinylbenzene-diethylene glycol divinyl ether terpolymer containing not less than 7% by weight divinylbenzene and not more than 2.3% by weight of diethylene glycol divinyl ether, aminolysed with dimethaminopropylamine and quaternized with methyl chloride	GMP
Reaction resin of formaldehyde, acetone, and tetraethylenepentamine	GMP
Regenerated cellulose, cross-linked and alkylated with epichlorohydrin and propylene oxide, then sulphonated, whereby the amount of epichlorohydrin plus propylene oxide employed does not exceed 250% of the starting quantity of cellulose	GMP
Styrene-divinylbenzene cross-linked coploymer, chloromethylated then aminated with dimethylamine and oxidised with hydrogen peroxide whereby the resin contains not more than 15% of vinyl N,N-dimethylbenzylamine-N-oxide and not more than 6.5% of nitrogen	GMP
Sulphite-modified cross-linked phenol-formaldehyde, with modification resulting in sulphonic acid groups on side chains	GMP
Sulphonated anthracite coal	GMP
Sulphonated copolymer of styrene and divinylbenzene	GMP
Sulphonated terpolymers of styrene, divinylbenzene, and acrylonitrile or methyl acrylate	GMP
Sulphonated tetrapolymer of styrene, divinylbenzene, acrylonitrile, and methyl acrylate derived from a mixture of monomers containing not more than a total of 2% be weight of acrylonitrile and methyl acrylate	GMP

9 Permitted lubricants, release and anti-stick agents

The processing aids listed in the Table to this clause may be used as lubricants, release and anti-stick agents in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 9

Substance	Maximum permitted level (mg/kg)
Acetylated mono- and diglycerides	100
Mineral oil based greases	GMP
Polysorbate 60	GMP
Sodium stearoyl lactate	GMP
Talc	GMP
Thermally oxidised soya-bean oil	320

10 Permitted carriers, solvents and diluents

The processing aids listed in the Table to this clause may be used as carriers, solvents and diluents in the course of manufacture of any food provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 10

Substance	Maximum permitted level (mg/kg)
Anhydrous sodium sulphate	GMP
Benzyl alcohol	500
Croscarmellose sodium	GMP
Ethyl acetate	GMP
Ethyl alcohol	GMP
Glycerol diacetate	GMP
Glyceryl monoacetate	GMP
Glycine	GMP
Isopropyl alcohol	1000
L-Leucine	GMP
Talc	GMP
Triethyl citrate	GMP

11 Permitted processing aids used in packaged water and in water used as an ingredient in other foods

The processing aids listed in the Table to this clause may be used in the course of manufacture of packaged water and in water used as an ingredient in other foods provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 11

Substance	Maximum permitted level (mg/kg)
Aluminium sulphate	GMP
Ammonium sulphate	GMP
Calcium hypochlorite	10 (available chlorine)
Calcium sodium polyphosphate	GMP
Chlorine	10 (available chlorine)
Chlorine dioxide	10 (available chlorine)
Cobalt sulphate	GMP
Copper sulphate	GMP
Cross-linked phenol-formaldehyde activated with one or both of triethylenetetramine or tetraethylenepentamine	GMP
Cross-linked polystyrene, first chloromethylated then aminated with trimethylamine, dimethylamine, diethylenetriamine or dimethylethanolamine	GMP
Diethylenetriamine, triethylenetetramine or tetraethylenepentamine cross-linked with epichlorohydrin	GMP
Ferric chloride	GMP
Ferric sulphate	GMP
Ferrous sulphate	GMP
Hydrofluorosilic acid (fluorosilic acid)	GMP
Hydrolyzed copolymers of methyl acrylate and divinylbenzene	GMP
Hydrolyzed terpolymers of methyl acrylate, divinylbenzene and acrylonitrile	GMP
Hydrogen peroxide	5
1-Hydroxyethylidene-1,1-diphosphonic acid	GMP
Lignosulphonic acid	GMP
Magnetite	GMP
Maleic acid polymers	GMP
Methyl acrylate-divinylbenzene copolymer containing not less than 2% divinylbenzene aminolysed with dimethylaminopropylamine	GMP
Methacrylic acid-divinylbenzene copolymer	GMP
Methyl acrylate-divinylbenzene-diethylene glycol divinyl ether terpolymer containing not less than 3.5% divinylbenzene and not more than 0.6% diethylene glycol divinyl ether, aminolysed with dimethylaminopropylamine	GMP
Modified polyacrylamide resins	GMP

Monobutyl ethers of polyethylene-polypropylene glycol	GMP
Ozone	GMP
Phosphorus acid	GMP
Polyaluminium chloride	GMP
Polydimethyldiallyl ammonium chloride	GMP
Polyelectrolytes (acrylamide monomers)	GMP
Polyoxypropylene glycol	GMP
Potassium permanganate	GMP
Reaction resin of formaldehyde, acetone and tetraethylenepentamine	GMP
Regenerated cellulose, cross-linked and alkylated with epichlorohydrin and propylene oxide	GMP
Silver ions	0.01
Sodium aluminate	GMP
Sodium fluoride	GMP
Sodium fluosilicate (Sodium silicofluoride)	GMP
Sodium fumate	GMP
Sodium glucoheptonate	1 (measured as cyanide)
Sodium gluconate	GMP
Sodium hypochlorite	10 (available chlorine)
Sodium lignosulphonate	GMP
Sodium metabisulphite	GMP
Sodium nitrate	GMP
Sodium polymethacrylate	2.5
Sodium sulphite (neutral or alkaline)	GMP
Styrene-divinylbenzene cross-linked copolymer	GMP
Sulphonated copolymer of styrene and divinylbenzene	GMP
Sulphonated terpolymers of styrene, divinylbenzene acrylonitrile and methyl acrylate	GMP
Sulphite modified cross-linked phenol-formaldehyde	GMP
Tannin powder extract	GMP
Tetrasodium ethylene diamine tetraacetate	GMP
Zinc sulphate	GMP

12 Permitted bleaching agents, washing and peeling agents

The processing aids listed in the Table to this clause may be used as bleaching agents, washing and peeling agents in the course of manufacture of the corresponding foods specified in the Table provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 12

Substance	Food	Maximum permitted level (mg/kg)
Benzoyl peroxide	All foods	40 (measured as benzoic acid)
Calcium hypochlorite	All foods	1.0 (available chlorine)
Chlorine	All foods	1.0 (available chlorine)
Chlorine dioxide	All foods	1.0 (available chlorine)
Diammonium hydrogen orthophosphate	All foods	GMP
2-Ethylhexyl sodium sulphate	All foods	0.7
Hydrogen peroxide	All foods	5
Oxides of nitrogen	All foods	GMP
Ozone	All foods	GMP
Peracetic acid	All foods	GMP
Sodium chlorite	All foods	1.0 (available chlorine)
Sodium dodecylbenzene sulphonate	All foods	0.7
Sodium hypochlorite	All foods	1.0 (available chlorine)
Sodium laurate	All foods	GMP
Sodium metabisulphite	Root and tuber vegetables	25
Sodium peroxide	All foods	5
Sodium persulphate	All foods	GMP
Triethanolamine	Dried vine fruit	GMP

13 Permitted extraction solvents

The processing aids listed in the Table to this clause may be used as extraction solvents in the course of manufacture of the corresponding foods specified in the Table provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 13

Substance	Food	Maximum permitted level (mg/kg)
Acetone	Flavourings	2
	Other foods	0.1
Benzyl alcohol	All foods	GMP
Butane	Flavourings	1
	Other foods	0.1
Butanol	All foods	10
Cyclohexane	All foods	1
Dibutyl ether	All foods	2
Diethyl ether	All foods	2
Ethyl acetate	All foods	10
Glyceryl triacetate	All foods	GMP
Hexanes	All foods	20

Isobutane	Flavourings	1
	Other foods	0.1
Methanol	All foods	5
Methylene chloride	Decaffeinated coffee	2
	Decaffeinated tea	2
	Flavourings	2
Methylethyl ketone	All foods	2
Propane	All foods	1
Toluene	All foods	1
Trichloroethylene	All foods	2

14 Permitted processing aids with miscellaneous functions

The processing aids listed in the Table to this clause may be used for the corresponding function specified in the Table, provided the final food contains no more than the corresponding maximum permitted level specified in the Table.

Table to clause 14

Substance	**Function**	**Maximum permitted level (mg/kg)**
Ammonium persulphate	Yeast washing agent	GMP
Ammonium sulphate	Decalcification agent for edible casings	GMP
β-Cyclodextrin	Used to extract cholesterol from eggs	GMP
Butanol	Suspension agent for sugar crystals	10
Carbonic acid	Bleached tripe washing agent	GMP
Cetyl alcohol	Coating agent on meat carcasses and primal cuts to prevent desiccation	1.0
Ethyl acetate	Cell disruption of yeast	GMP
Ethylene diamine tetraacetic acid	Metal sequestrant for edible fats and oils and related products	GMP
Gibberellic acid	Barley germination	GMP
Gluteral	Manufacture of edible collagen casings	GMP
Hydrogen peroxide	Inhibiting agent for dried vine fruits, fruit and vegetable juices, sugar, vinegar and yeast autolysate	5
	Removal of glucose from egg products	5
	Removal of sulphur dioxide	5
Indole acetic acid	Barley germination	GMP
L-Cysteine (or HCl salt)	Dough conditioner	75
Morpholine	Solubilising agent for coating mixtures on fruits	GMP
Oak chips	For use in the manufacture of wine	GMP

Paraffin	Coatings for cheese and cheese products	GMP
Polysorbate 80	Manufacture of edible collagen casings	GMP
Polyvinyl acetate	Preparation of waxes for use in cheese and cheese products	GMP
Potassium bromate	Germination control in malting	0.1
Sodium bromate	Germination control in malting	0.1
Sodium gluconate	Denuding, bleaching & neutralising tripe	GMP
Sodium glycerophosphate	Cryoprotectant for starter culture	GMP
Sodium metabisulphite	Dough conditioner	60
	Removal of excess chlorine	60
	Softening of corn kernels for starch manufacture	60 (in the starch)
	Treatment of hides for use in gelatine and collagen manufacture	GMP
Sodium sulphide	Treatment of hides for use in gelatine and collagen manufacture	GMP
Sodium sulphite	Dough conditioner	60
Stearyl alcohol	Coating agent on meat carcasses and primal cuts to prevent desiccation	GMP
Sulphur dioxide	Control of nitrosodimethylamine in malting	750
	Treatment of hides for use in gelatine and collagen manufacture	750
Sulphurous acid	Softening of corn kernels	GMP
	Treatment of hides for use in gelatine and collagen manufacture	GMP
Triethanolamine	Solubilising agent for coating mixtures for fruits	GMP
Urea	Manufacture of concentrated gelatine solutions	1.5 times the mass of the gelatine present
Woodflour from untreated *Pinus radiata*	Gripping agent used in the treatment of hides	GMP

15 Permitted enzymes of animal origin

The processing aids listed in the Table to this clause may be used as enzymes in the course of manufacture of any food provided the enzyme is derived from the corresponding source specified in the Table.

Table to clause 15

Enzyme	Source

Lipase EC [3.1.1.3]	Bovine stomach; salivary glands or forestomach of calf, kid or lamb; porcine or bovine pancreas
Pepsin EC [3.4.23.1]	Bovine or porcine stomach
Phospholipase A_2 EC [3.1.1.4]	Porcine pancreas
Thrombin EC [3.4.21.5]	Bovine or porcine blood
Trypsin EC [3.4.21.4]	Porcine or bovine pancreas

16 Permitted enzymes of plant origin

The processing aids listed in the Table to this clause may be used as enzymes in the course of manufacture of any food provided the enzyme is derived from the corresponding source specified in the Table.

Table to clause 16

Enzyme	Source
ß-Amylase EC [3.2.1.2]	Sweet potato (*Ipomoea batatas]*
Actinidin	Kiwifruit (*Actinidia deliciosa*)
Bromelain EC [3.4.22.4]	Pineapple stem (*Ananas comosus]*
Ficin EC [3.4.22.3]	*Ficus* sp
Malt carbohydrases α-Amylase & ß-Amylase combined EC [3.2.1.1] / EC [3.2.1.2]	Malted cereals
Papain EC [3.4.22.2]	*Carica papaya*

17 Permitted enzymes of microbial origin

(1) The processing aids listed in the Table to this clause may be used as enzymes in the course of manufacture of any food provided the enzyme is derived from the corresponding source or sources specified in the Table.

(2) The sources listed in the Table to this clause may contain additional copies of genes from the same organism.

Table to clause 17

Enzyme	Source
α-Acetolactate decarboxylase EC [4.1.1.5]	*Bacillus subtilis* *Bacillus subtilis*, containing the gene for α-Acetolactate decarboxylase isolated from *Bacillus brevis*
Aminopeptidase EC [3.4.11.1]	*Lactococcus lactis* *Aspergillus oryzae*
α-Amylase EC [3.2.1.1]	*Aspergillus niger* *Aspergillus oryzae* *Bacillus licheniformis* *Bacillus licheniformis*, containing the gene for α-Amylase isolated from *Bacillus stearothermophilus* *Bacillus subtilis* *Bacillus subtilis*, containing the gene for α-Amylase isolated from *Bacillus stearothermophilus*
ß-Amylase EC [3.2.1.2]	*Bacillus subtilis*
Arabinase EC [3.2.1.99]	*Aspergillus niger*
Arabino-furanosidase EC [3.2.1.55]	*Aspergillus niger*
Carboxyl proteinase EC [3.4.23.6]	*Aspergillus melleus* *Aspergillus niger* *Aspergillus oryzae* *Rhizomucor miehei*
Catalase EC [1.11.1.6]	*Aspergillus niger* *Micrococcus luteus*
Cellulase EC [3.2.1.4]	*Aspergillus niger* *Trichoderma reesei* *Trichoderma viride*
Chymosin EC [3.4.23.4]	*Aspergillus niger var awamori* *Escherichia coli* K-12 strain GE81 *Kluyveromyces lactis* CHY 1
Cyclodextrin glucanotransferase EC [2.4.1.19]	*Paenibacillus macerans*
Dextranase EC [3.2.1.11]	*Chaetomium gracile* *Penicillium lilacinum*
Esterase EC [3.1.1.1]	*Rhizomucor miehei*
α-Galactosidase EC [3.2.1.22]	*Aspergillus niger*
ß-Glucanase EC [3.2.1.6]	*Aspergillus niger* *Aspergillus oryzae* *Bacillus subtilis* *Disporotrichum dimorphosporum* *Humicola insolens* *Talaromyces emersonii* *Trichoderma reesei*
Glucoamylase EC [3.2.1.3]	*Aspergillus niger* *Aspergillus oryzae* *Rhizopus delemar* *Rhizopus oryzae* *Rhizopus niveus*
Glucose isomerase or glucose	*Actinoplanes missouriensis*

isomerase xylose isomerase EC [5.3.1.5]	*Bacillus coagulans* *Microbacterium arborescens* *Streptomyces olivaceus* *Streptomyces olivochromogenes* *Streptomyces murinus* *Streptomyces rubiginosus*
Glucose oxidase EC [1.1.3.4]	*Aspergillus niger*
α-Glucosidase (maltase) EC [3.2.1.20]	*Aspergillus oryzae* *Aspergillus niger*
ß-Glucosidase EC [3.2.1.21]	*Aspergillus niger*
ß-Glucosidase exo-1,3 EC [3.2.1.58]	*Trichoderma harzianum*
Hemicellulase endo-1,3-ß-xylanase EC [3.2.1.32]	*Humicola insolens*
Hemicellulase endo-1,4-ß-xylanase or xylanase EC [3.2.1.8]	*Aspergillus niger* *Aspergillus oryzae* *Aspergillus oryzae*, containing the gene for Hemicellulase endo-1,4-α-xylanase isolated from *Aspergillus aculeatus* *Aspergillus oryzae*, containing the gene for Hemicellulase endo-1,4-α-xylanase isolated from *Thermomyces lanuginosus* *Bacillus subtilis* *Humicola insolens* *Trichoderma reesei*
Hemicellulase multicomponent enzyme EC [3.2.1.78]	*Aspergillus niger* *Bacillus subtilis* *Trichoderma reesei*
Inulinase EC [3.2.1.7]	*Aspergillus niger*
Invertase EC [3.2.1.26]	*Saccharomyces cerevisiae*
Lactase ß-Galactosidase EC [3.2.1.23]	*Aspergillus niger* *Aspergillus oryzae* *Saccharomyces fragilis* *Saccharomyces lactis*
Lipase, monoacylglycerol EC [3.1.1.23]	*Penicillium camembertii*
Lipase, triacylglycerol EC [3.1.1.3]	*Aspergillus niger* *Aspergillus oryzae* *Aspergillus oryzae*, containing the gene for Lipase, triacylglycerol isolated from *Humicola lanuginosa* *Rhizopus arrhizus* *Rhizomucor miehei* *Rhizophus niveus* *Rhizophus oryzae*
Maltogenic amylase EC [3.2.1.133]	*Bacillus subtilis* containing the gene for maltogenic amylase isolate from *Bacillus stearothermophilus*
Metalloproteinase EC [3.4.24.4]	*Aspergillus oryzae* *Bacillus subtilis* *Bacillus coagulans*
Mucorpepsin EC [3.4.23.23]	*Aspergillus oryzae* *Aspergillus oryzae*, containing the gene for Aspartic proteinase isolated from *Rhizomucor meihei* *Rhizomucor meihei*

	Cryphonectria parasitica
Pectin lyase [EC 4.2.2.10]	*Aspergillus niger*
Pectin methylesterase or Pectinesterase [3.1.1.11]	*Aspergillus niger*
Phytase EC [3.1.3.8]	*Aspergillus niger*
Polygalacturonase or Pectinase multicomponent enzyme EC [3.2.1.15]	*Aspergillus niger* *Aspergillus oryzae* *Trichoderma reesei*
Pullulanase EC [3.2.1.41]	*Bacillus acidopullulyticus* *Bacillus licheniformis* *Bacillus subtilis* *Klebsiella pneumoniae*
Serine proteinase EC [3.4.21.14]	*Bacillus lentus* *Bacillus licheniformis* *Bacillus subtilis* *Aspergillus oryzae*
Transglutaminase EC [2.3.2.13]	*Streptomyces mobaraense*

Editorial note:

Bacillus subtilis covers the strain known under the name *Bacillus amyloliquefaciens*.
The *Aspergillus niger* group covers strains known under the names *Aspergillus aculeatus, A. awamori, A. ficuum, A. foetidus, A. japonicus, A. phoenicis, A. saitor* and *A. usamii*.
Trichoderma reesei is also known as *Trichoderma longibrachiatum*.
Saccharomyces fragilis is also known as *Kluyveromyces fragilis* and *Kluyveromyces marxianus var. marxianus.*
Saccharomyces lactis is also known as *Kluyveromyces lactis*.
Mucor miehei is the former name for *Rhizomucor miehei*.
Micrococcus lysodeikticus is the former name for *Microccocus luteus*.
Bacillus macerans is the former name for *Paenibacillus macerans.*
Penicillium emersonii is the former name for *Talaromyces emersonii*.
Klebsiella aerogenes is the former name for *Klebsiella pneumoniae*
Streptoverticillium mobaraense is the former name for *Streptomyces mobaraense*

18 Permitted microbial nutrients and microbial nutrient adjuncts

The processing aids listed in the Table to this clause may be used as microbial nutrients or microbial nutrient adjuncts in the course of manufacture of any food.

Table to clause 18

Adenine	Manganese chloride
Adonitol	Manganese sulphate
Ammonium sulphate	Niacin
Arginine	Nitric acid
Asparagine	Pantothenic acid
Aspartic acid	Peptone

Benzoic acid	Phytates
Biotin	Polysorbate 80
Calcium pantothenate	Polyvinylpyrrolidone
Calcium propionate	Pyridoxine hydrochloride
Copper sulphate	Riboflavin
Cystine	Sodium formate
Cysteine monohydrochloride	Sodium molybdate
Dextran	Sodium tetraborate
Dextrin	Thiamin
Ferrous sulphate	Threonine
Glutamic acid	Trehalose
Glycine	Uracil
Guanine	Urea
Histidine	Xanthine
Hydroxyethyl starch	Zinc chloride
Inosine	Zinc sulphate
Inositol	