CODEX ALIMENTARIUS

ISSN 0259-2916

Milk and Milk Products

First edition

World Health Organization

Food and Agriculture Organization of the United Nations

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WORLD HEALTH ORGANIZATION

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2007

ISBN 978-92-5-105837-4

THE CODEX ALIMENTARIUS COMMISSION

The Codex Alimentarius Commission is an intergovernmental body with over 170 members, within the framework of the Joint Food Standards Programme established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), with the purpose of protecting the health of consumers and ensuring fair practices in the food trade. The Commission also promotes coordination of all food standards work undertaken by international governmental and non governmental organizations.

The *Codex Alimentarius* (Latin, meaning Food Law or Code) is the result of the Commission's work: a collection of internationally adopted food standards, guidelines, codes of practice and other recommendations. The texts in this publication are part of the Codex Alimentarius.

MILK AND MILK PRODUCTS
First edition

The Codex Standards for Milk and Milk Products and other related texts such as the *Code of Hygienic Practice for Milk and Milk Products* are collected and published in this compact format to allow their wide use and understanding by governments, regulatory authorities, food industries and retailers, and consumers. This first edition includes all texts adopted by the Codex Alimentarius Commission up to 2007.

Further information on these texts, or any other aspect of the Codex Alimentarius Commission, may be obtained from:

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MILK AND MILK PRODUCTS
First edition

CODEX STANDARD FOR BUTTER

CODEX STAN A-1-1971, Rev.1-1999, Amended in 2003 and 2006

1. SCOPE

This Standard applies to butter intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Butter is a fatty product derived exclusively from milk and/or products obtained from milk, principally in the form of an emulsion of the type water-in-oil.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

- Sodium chloride and food grade salt
- Starter cultures of harmless lactic acid and/or flavour producing bacteria
- Potable water.

3.3 Composition

Minimum milkfat content	80% m/m
Maximum water content	16% m/m
Maximum milk solids-not-fat content	2% m/m

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the *Codex General Standard for Food Additives* (CODEX STAN 192-1995) in Food Category 02.2.1.1 (Butter and concentrated butter) may be used in foods subject to this standard.

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be "Butter". The name "butter" with a suitable qualification shall be used for butter with more than 95% fat.

7.1.1 Butter may be labelled to indicate whether it is salted or unsalted according to national legislation.

7.2 Declaration of milkfat content

If the consumer would be misled by the omission, the milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR MILKFAT PRODUCTS

CODEX STAN A-2-1973, Rev.1-1999, Amended 2006

The Annex to this Standard contains provisions which are not intended to be applied within the meaning of the acceptance provisions of Section 4.A(I)(b) of the *General Principles of the Codex Alimentarius*.

1. SCOPE

This Standard applies to Anhydrous Milkfat, Milkfat, Anhydrous Butteroil, Butteroil and Ghee, which are intended for further processing or culinary use, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

2.1 ***Anhydrous Milkfat, Milkfat, Anhydrous Butteroil and Butteroil*** are fatty products derived exclusively from milk and/or products obtained from milk by means of processes which result in almost total removal of water and non-fat solids.

2.2 ***Ghee*** is a product exclusively obtained from milk, cream or butter, by means of processes which result in almost total removal of water and non-fat solids, with an especially developed flavour and physical structure.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

Starter cultures of harmless lactic acid producing bacteria.

3.3 Composition

	Anhydrous milkfat/ Anhydrous butteroil	Milkfat	Butteroil	Ghee
Minimum milkfat (% m/m)	99.8	99.6	99.6	99.6
Maximum water (% m/m)	0.1	–	–	–

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the *Codex General Standard for Food Additives* (CODEX STAN 192-1995) in Food Category 02.1.1 (Butter oil, anhydrous milkfat, ghee) may be used in foods subject to this standard.

4.1 Inert gas with which airtight containers are flushed before, during and after filling with product.

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Anhydrous milkfat Milkfat Anhydrous butteroil Butteroil Ghee	According to description specified in Section 2, composition specified in 3 and the use of antioxidants (see Section 4).

7.2 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container.

However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

ANNEX

This text is intended for voluntary application by commercial partners and not for application by governments.

1. OTHER QUALITY FACTORS

	Anhydrous milkfat/ Anhydrous butteroil	Milkfat	Butteroil	Ghee
Maximum free fatty acids (% m/m as oleic acid)	0.3	0.4	0.4	0.4
Maximum peroxide value (milli-equivalents of oxygen/kg fat)	0.3	0.6	0.6	0.6
Taste and odour	Acceptable for market requirements after heating a sample to 40–45°C			
Texture	Smooth and fine granules to liquid, depending on temperature			

2. OTHER CONTAMINANTS

Heavy metals

The following limits apply to Anhydrous Milkfat, Milkfat, Anhydrous Butteroil and Butteroil and Ghee:

Metal	Maximum level
Copper	0.05 mg/kg
Iron	0.2 mg/kg

3. OTHER METHODS OF ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR EVAPORATED MILKS

CODEX STAN A-3-1971, Rev.1-1999

1. SCOPE

This Standard applies to evaporated milks, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Evaporated milks are milk products which can be obtained by the partial removal of water from milk by heat, or by any other process which leads to a product of the same composition and characteristics. The fat and/or protein content of the milk may have been adjusted, only to comply with the compositional requirements in Section 3 of this Standard, by the addition and/or withdrawal of milk constituents in such a way as not to alter the whey protein to casein ratio of the milk being adjusted.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and milk powders*, cream and cream powders*, milkfat products*.

The following milk products are allowed for protein adjustment purposes:

- milk retentate — Milk retentate is the product obtained by concentrating milk protein by ultrafiltration of milk, partly skimmed milk, or skimmed milk;
- milk permeate — Milk permeate is the product obtained by removing milk proteins and milkfat from milk, partly skimmed milk, or skimmed milk by ultrafiltration; and
- lactose *.

* For specification, see relevant Codex standard.

3.2 Permitted ingredients

Potable water
Sodium chloride.

3.3 Composition

Evaporated milk

Minimum milkfat	7.5% m/m
Minimum milk solids**	25% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Evaporated skimmed milk

Maximum milkfat	1% m/m
Minimum milk solids**	20% m/m

Minimum milk protein in milk solids-not-fat**	34% m/m

Evaporated partly skimmed milk

Milkfat	More than 1% and less than 7.5% m/m
Minimum milk solids**	20% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Evaporated high-fat milk

Minimum milkfat	15% m/m
Minimum milk solids-not-fat**	11.5% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

** The milk solids and milk solids-not-fat content include water of crystallization of the lactose.

4. FOOD ADDITIVES

Only those food additives listed below may be used and only within the limits specified.

INS no.	Name of additive	Maximum level
Firming agents		
508	Potassium chloride	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
509	Calcium chloride	
Stabilizers		
331	Sodium citrates	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
332	Potassium citrates	
333	Calcium citrates	
Acidity regulators		
170	Calcium carbonates	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
339	Sodium phosphates	
340	Potassium phosphates	
341	Calcium phosphates	
450	Diphosphates	
451	Triphosphates	
452	Polyphosphates	
500	Sodium carbonates	
501	Potassium carbonates	
Thickener		
407	Carrageenan	150 mg/kg
Emulsifier		
322	Lecithins	Limited by GMP

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Evaporated milk
Evaporated skimmed milk
Evaporated partly skimmed milk
Evaporated high-fat milk

} according to the composition specified in Section 3

Evaporated partly skimmed milk may be designated "evaporated semi-skimmed milk" if the milkfat content is 4.0–4.5% and the minimum milk solids is 24% m/m.

7.2 Declaration of milkfat content

If the consumer would be misled by the omission, the milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.3 Declaration of milk protein

If the consumer would be misled by the omission, the milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either as (i) a percentage by mass or volume, or (ii) grams per serving as quantified in the label provided that the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), milk products used only for protein adjustment need not be declared.

7.5 Labelling of non-retail containers

Information required in Section 7 of this Standards and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR SWEETENED CONDENSED MILKS

CODEX STAN A-4-1971, Rev.1-1999

1. SCOPE

This Standard applies to sweetened condensed milks, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Sweetened condensed milks are milk products which can be obtained by the partial removal of water from milk with the addition of sugar, or by any other process which leads to a product of the same composition and characteristics. The fat and/or protein content of the milk may have been adjusted, only to comply with the compositional requirements in Section 3 of this Standard, by the addition and/or withdrawal of milk constituents in such a way as not to alter the whey protein to casein ratio of the milk being adjusted.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and milk powder*, cream and cream powders*, milkfat products*.

The following milk products are allowed for protein adjustment purposes:

- milk retentate — Milk retentate is the product obtained by concentrating milk protein by ultrafiltration of milk, partly skimmed milk, or skimmed milk;
- milk permeate — Milk permeate is the product obtained by removing milk proteins and milkfat from milk, partly skimmed milk, or skimmed milk by ultrafiltration; and
- lactose* — (Also for seeding purposes)

* For specification, see relevant Codex standard.

3.2 Permitted ingredients

Potable water

Sugar

Sodium chloride

In this product, sugar is generally considered to be sucrose, but a combination of sucrose with other sugars, consistent with Good Manufacturing Practice, may be used.

3.3 Composition

Sweetened condensed milk

Minimum milkfat	8% m/m
Minimum milk solids**	28% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Sweetened condensed skimmed milk

Maximum milkfat	1% m/m
Minimum milk solids**	24% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Sweetened condensed partly skimmed milk

Milkfat	More than 1% and less than 8% m/m
Minimum milk solids-not-fat**	20% m/m
Minimum milk solids**	24% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Sweetened condensed high-fat milk

Minimum milkfat	16% m/m
Minimum milk solids-not-fat**	14% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

** The milk solids and milk solids-not-fat content include water of crystallization of the lactose.

For all sweetened condensed milks the amount of sugar is restricted by Good Manufacturing Practice to a minimum value which safeguards the keeping quality of the product and a maximum value above which crystallization of sugar, may occur.

4. FOOD ADDITIVES

Only those food additives listed below may be used and only within the limits specified.

INS no.	Name of additive	Maximum level
Firming agents		
508	Potassium chloride	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
509	Calcium chloride	
Stabilizers		
331	Sodium citrates	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
332	Potassium citrates	
333	Calcium citrates	

INS no.	Name of additive	Maximum level
Acidity regulators		
170	Calcium carbonates	2 g/kg singly or 3 g/kg in combination, expressed as anhydrous substances
339	Sodium phosphates	
340	Potassium phosphates	
341	Calcium phosphates	
450	Diphosphates	
451	Triphosphates	
452	Polyphosphates	
500	Sodium carbonates	
501	Potassium carbonates	
Thickener		
407	Carrageenan	150 mg/kg
Emulsifier		
322	Lecithins	Limited by GMP

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Sweetened condensed milk
Sweetened condensed skimmed milk
Sweetened condensed partly skimmed milk
Sweetened condensed high-fat milk

} according to the composition specified in Section 3

Sweetened condensed partly skimmed milk may be designated "sweetened condensed semi-skimmed milk" if the milkfat content is 4.0–4.5% and the minimum milk solids is 28% m/m.

7.2 Declaration of milkfat content

If the consumer would be misled by the omission, the milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.3 Declaration of milk protein

If the consumer would be misled by the omission, the milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either as (i) a percentage by mass or volume, or (ii) grams per serving as quantified in the label provided the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), milk products used only for protein adjustment need not be declared.

7.5 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR CREAM AND PREPARED CREAMS

CODEX STAN A-9-1976, Rev. 1-2003

1. SCOPE

This Standard applies to cream and prepared creams for direct consumption or further processing as defined in Section 2 of this Standard.

2. DESCRIPTION

2.1 ***Cream*** is the fluid[1] milk product comparatively rich in fat, in the form of an emulsion of fat-in-skimmed milk, obtained by physical separation from milk.

2.2 ***Reconstituted cream*** is cream obtained by reconstituting milk products with or without the addition of potable water and with the same end product characteristics as the product described in Section 2.1.

2.3 ***Recombined cream*** is cream obtained by recombining milk products with or without the addition of potable water and with the same end product characteristics as the product described in Section 2.1.

2.4 ***Prepared creams*** are the milk products obtained by subjecting cream, reconstituted cream and/or recombined cream to suitable treatments and processes to obtain the characteristic properties as specified below.

2.4.1 ***Prepackaged liquid cream*** is the fluid[1] milk product obtained by preparing and packaging cream, reconstituted cream and/or recombined cream for direct consumption and/or for direct use as such.

2.4.2 ***Whipping cream*** is the fluid[1] cream, reconstituted cream and/or recombined cream that is intended for whipping. When cream is intended for use by the final consumer the cream should have been prepared in a way that facilitates the whipping process.

2.4.3 ***Cream packed under pressure*** is the fluid[1] cream, reconstituted cream and/or recombined cream that is packed with a propellant gas in a pressure-propulsion container and which becomes Whipped Cream when removed from that container.

2.4.4 ***Whipped cream*** is the fluid[1] cream, reconstituted cream and/or recombined cream into which air or inert gas has been incorporated without reversing the fat-in-skimmed milk emulsion.

[1] Fluid means capable of pouring at temperatures above freezing.

2.4.5 ***Fermented cream*** is the milk product obtained by fermentation of cream, reconstituted cream or recombined cream, by the action of suitable micro-organisms, that results in reduction of pH with or without coagulation. Where the content of (a) specific micro-organism(s) is(are) indicated, directly or indirectly, in the labelling or otherwise indicated by content claims in connection with sale, these shall be present, viable, active and abundant in the product to the date of minimum durability. If the product is heat-treated after fermentation the requirement for viable micro-organisms does not apply.

2.4.6 ***Acidified cream*** is the milk product obtained by acidifying cream, reconstituted cream and/or recombined cream by the action of acids and/or acidity regulators to achieve a reduction of pH with or without coagulation.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

All creams and prepared creams:
Milk, which may have been subjected to mechanical and physical treatments prior to cream processing.

Additionally, for creams made by reconstitution or recombination:
Butter[2], milk fat products[2], milk powders[2], cream powders[2], and potable water.

Additionally, for prepared creams described in Section 2.4.2 through to Section 2.4.6:
The product that remains after the removal of milk fat by churning milk and cream to manufacture butter and milk fat products (often referred to as buttermilk) and that may have been concentrated and/or dried.
* For specifications, see the relevant Codex standards.

3.2 Permitted ingredients

Only those ingredients listed below may be used for the purposes and product categories specified, and only within the limitations specified.

For use in products only for which stabilizers and/or thickeners are justified (see table in Section 4):

- Products derived exclusively from milk or whey and containing 35% (m/m) or more of milk protein of any type (including casein and whey protein products and concentrates and any combinations thereof) and milk powders: These products can be used in the same function as thickeners and stabilizers, provided they are added only in amounts functionally necessary not exceeding 20 g/kg, taking into account any use of the stabilizers and thickeners listed in Section 4.
- Gelatine and starch: These substances can be used in the same function as stabilizers, provided they are added only in amounts functionally necessary as

[2] For specification, see relevant Codex Standard.

governed by Good Manufacturing Practice taking into account any use of the stabilizers/thickeners listed in section 4.

Additionally, for use in fermented cream, only:

- Starter cultures of harmless micro-organisms including those specified in Section 2 of the *Codex Standard for Fermented Milks*.

Additionally, for use in fermented cream and acidified cream, only:

- Rennet and other safe and suitable coagulating enzymes to improve texture without achieving enzymatic coagulation.
- Sodium chloride.

3.3 Composition

Milk fat: Minimum 10% (w/w)

Compositional modification below the minimum specified above for milk fat is not considered to be in compliance with the Section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those additives listed below may be used and only within the limits specified.

Stabilizers and thickeners, including modified starches may be used singly or in combination, in compliance with the definitions for milk products and only to the extent that they are functionally necessary, taking into account any use of gelatine and starch as provided for in Section 3.2.

Product category	Additive functional class			
	Stabilizers*	Acidity regulators*	Thickeners* and emulsifiers*	Packing gases and propellants
Prepackaged liquid cream (2.4.1):	X	X	X	–
Whipping cream (2.4.2):	X	X	X	–
Cream packed under pressure (2.4.3):	X	X	X	X
Whipped cream (2.4.4):	X	X	X	X
Fermented cream (2.4.5):	X	X	X	–
Acidified cream (2.4.6):	X	X	X	–

* These additives may be used when needed to ensure product stability and integrity of the emulsion, taking into consideration the fat content and durability of the product. With regard to the durability, special consideration should be given to the level of heat treatment applied since some minimally pasteurized products do not require the use of certain additives.

X = The use of additives belonging to the class is technologically justified.

– = The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Stabilizers		
170	Calcium carbonates	Limited by GMP
325	Sodium lactate	
326	Potassium lactate	
327	Calcium lactate	
331	Sodium citrates	
332	Potassium citrates	
333	Calcium citrates	
516	Calcium sulphate	
339	Sodium phosphates	2 g/kg, singly or in combination, expressed as P_2O_5
340	Potassium phosphates	
341	Calcium phosphates	
450	Diphosphates	
451	Triphosphates	
452	Polyphosphates	
Acidity regulators		
500	Sodium carbonates	Limited by GMP
501	Potassium carbonates	
270	Lactic acid (L, D, and DL-)	
330	Citric acid	
Thickeners and emulsifiers		
322	Lecithins	Limited by GMP
400	Alginic acid	
401	Sodium alginate	
402	Potassium alginate	
403	Ammonium alginate	
404	Calcium alginate	
406	Agar	
407	Carrageenan and its Na, K, NH_4 salts	
410	Carob bean gum	
412	Guar gum	
414	Gum Arabic	
415	Xanthan gum	
418	Gellan gum	
432	Polyoxyethylene (20) sorbitan monolaurate	1 g/kg
433	Polyoxyethylene (20) sorbitan monooleate	
434	Polyoxyethylene (20) sorbitan monopalmitate	
435	Polyoxyethylene (20) sorbitan monostearate	
436	Polyoxyethylene (20) sorbitan tristearate	

INS no.	Name of additive	Maximum level
440	Pectins	Limited by GMP
460	Cellulose	
461	Methyl cellulose	
463	Hydroxypropyl cellulose	
464	Hydroxypropyl methyl cellulose	
465	Methyl ethyl cellulose	
466	Sodium carboxymethyl cellulose	
471	Mono- and diglycerides of fatty acids	
472a	Acetic and fatty acid esters of glycerol	
472b	Lactic and fatty acid esters of glycerol	
472c	Citric and fatty acid esters of glycerol	
508	Potassium chloride	
509	Calcium chloride	
1410	Monostarch phosphate	Limited by GMP
1412	Distarch phosphate esterified with sodium trimetaphosphate: esterified with phosphorus oxychloride	
1413	Phosphated distarch phosphate	
1414	Acetylated distarch phosphate	
1420	Starch acetate esterified with acetic anhydride	
1422	Acetylated distarch adipate	
1440	Hydroxypropyl starch	
1442	Hydroxypropyl distarch phosphate	
1450	Starch sodium octenyl succinate	
Packing gases and propellants **For use only in whipped creams (including creams packed under pressure):**		
290	Carbon dioxide	Limited by GMP
941	Nitrogen	
942	Nitrous oxide	

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 209-1999), the following specific provisions apply:

7.1 Name of the food

7.1.1 The name of the food shall be as specified in section 2 of this Standard, as appropriate and taking into account section 7.1.3. However, "prepackaged liquid cream" may be designated as "cream" and "cream packed under pressure" may be designated by another descriptive term that refers to its nature or intended use or as "Whipped Cream". The term "prepared cream" should not apply as a designation.

The products covered by this Standard may alternatively be designated with other names specified in the national legislation of the country in which the product is manufactured and/or sold or with a name existing by common usage, provided that such designations do not create an erroneous impression in the country of retail sale regarding the character and identity of the food.

In addition, labelling statements, such as product designation of fermented creams and content claims, may include reference to the terms "Acidophilus", "Kefir", and "Kumys", as appropriate, provided that the product has been fermented by the corresponding specific starter culture(s) specified in section 2.1 of the *Codex Standard for Fermented Milks*, and provided that the product complies with those compositional microbiological criteria that are applicable to the corresponding fermented milk as specified in section 3.3 of that Standard.

7.1.2 The designation shall be accompanied by an indication of the fat content that is acceptable in the country of retail sale, either as a numerical value or by a suitable qualifying term, either as part of the name or in a prominent position in the same field of vision.

Nutrition claims, when used, shall be in accordance with the *Codex Guidelines for Use of Nutrition Claims* (CAC/GL 23-1997). For this purpose only, the level of 30% milk fat constitutes the reference.

7.1.3 Creams which have been manufactured by the recombination or reconstitution of dairy ingredients as specified in Sections 2.2 and 2.3 shall be labelled as "Recombined cream" or "Reconstituted cream" or another truthful qualifying term if the consumer would be misled by the absence of such labelling.

7.1.4 An appropriate description of the heat treatment should be given, either as part of the name or in a prominent position in the same field of vision, if the consumer would be misled by the absence of such labelling.

When reference is made in the labelling to the type of heat treatment(s) applied, the definitions established by the Codex Alimentarius Commission shall apply.

7.2 Declaration of milk fat content

The milk fat content shall be declared in a manner acceptable in the country of sale to the final consumer, either as (i) a percentage of mass or volume, (ii) in grams per serving as qualified in the label, provided that the number of servings is stated.

Where the fat content of the product is indicated by a numerical value in accordance with Section 7.1.2, such indication may constitute the fat declaration, provided that the indication includes any additional information as required above.

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods*, and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

STANDARD FOR WHEY POWDERS

CODEX STAN A-15-1995, Rev. 1-2003, Amd. 2006

1. SCOPE

This Standard applies to Whey Powder and Acid Whey Powder, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Whey powders are milk products obtained by drying whey or acid whey.

Whey is the fluid milk product obtained during the manufacture of cheese, casein or similar products by separation from the curd after coagulation of milk and/or of products obtained from milk. Coagulation is obtained through the action of, principally, rennet type enzymes.

Acid whey is the fluid milk product obtained during the manufacture of cheese, casein or similar products by separation from the curd after coagulation of milk and/or of products obtained from milk. Coagulation is obtained, principally, by acidification.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Whey or acid whey.

3.2 Permitted ingredients

Seed lactose[1] in the manufacture of pre-crystallized whey powder.

3.3 Composition

Whey powder:

Criteria	Minimum content	Reference content	Maximum content
Lactose[(a)]	n.s.	61.0% (m/m)	n.s.
Milk protein[(b)]	10.0% (m/m)	n.s.	n.s.
Milk fat	n.s.	2.0% (m/m)	n.s.
Water[(c)]	n.s.	n.s.	5.0% (m/m)
Ash	n.s	n.s.	9.5% (m/m)
pH (in 10% solution)*	> 5.1	n.s.	n.s.

* or titratable acidity (calculated as lactic acid) <0.35%

[1] For specification, see relevant Codex Standard.

Acid whey powder:

Criteria	Minimum content	Reference content	Maximum content
Lactose[(a)]	n.s.	61.0% (m/m)	n.s.
Milk protein[(b)]	7.0% (m/m)	n.s.	n.s.
Milk fat	n.s.	2.0% (m/m)	n.s.
Water[(c)]	n.s.	n.s.	4.5% (m/m)
Ash	n.s.	n.s.	15.0% (m/m)
pH (in 10% solution) *	n.s.	n.s.	≥ 5.1

* or titratable acidity (calculated as lactic acid) ≥ 0.35%
(a) Although the products may contain both anhydrous lactose and lactose monohydrate, the lactose content is expressed as anhydrous lactose. 100 parts of lactose monohydrate contain 95 parts of anhydrous lactose.
(b) Protein content is 6.38 multiplied by the total Kjeldahl nitrogen determined.
(c) The water content does not include water of crystallization of the lactose.

In accordance with the provision of section 4.3.3 of the *General Standard for the Use of Dairy Terms*, whey powders may be modified in composition to meet the desired end-product composition, for instance, neutralization or demineralization. However, compositional modifications beyond the minima or maxima specified above for milk protein and water are not considered to be in compliance with the Section 4.3.3.

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the *Codex General Standard for Food Additives* (CODEX STAN 192-1995) in Food Category 01.8.2 (Dried whey and whey products, excluding whey cheese) may be used in foods subject to this standard.

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Whey powder
Acid whey powder
} According to the definitions in section 2 and compositions as specified in Section 3.3.

The designation of products in which the fat and/or lactose contents are below or above the reference content levels specified in Section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the lactose and/or fat content, respectively, either as part of the name or in a prominent position in the same field of vision.

The term "sweet" may accompany the name of whey powder, provided that the whey powder meets the following compositional criteria:

minimum lactose:	65%
minimum protein:	11%
maximum ash:	8.5%
pH (10% solution)*:	>6

* or titratable acidity of maximum 0.16% (calculated as lactic acid).

7.2 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR EDIBLE CASEIN PRODUCTS

CODEX STAN A-18-1995 Rev.1-2001

The Annex to this Standard contains provisions which are not intended to be applied within the meaning of the acceptance provisions of Section 4.A.(I)(b) of the *General Principles of the Codex Alimentarius*.

1. SCOPE

This Standard applies to edible acid casein, edible rennet casein and edible caseinate, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Edible acid casein is the milk product obtained by separating, washing and drying the acid-precipitated coagulum of skimmed milk and/or of other products obtained from milk.

Edible rennet casein is the milk product obtained by separating, washing and drying the coagulum of skimmed milk and/or of other products obtained from milk. The coagulum is obtained through the reaction of rennet or other coagulating enzymes.

Edible caseinate is the milk product obtained by action of edible casein or edible casein curd coagulum with neutralizing agents followed by drying.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Skimmed milk and/or other products obtained from milk.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid producing bacteria
- Rennet or other safe and suitable coagulating enzymes
- Potable water

3.3 Composition

	Rennet casein	Acid casein	Caseinates
Minimum milk protein in dry matter[(a)]	84.0% m/m	90.0% m/m	88.0% m/m
Minimum content of casein in milk protein	95.0% m/m	95.0% m/m	95.0% m/m
Maximum water[(b)]	12.0% m/m	12.0% m/m	8.0% m/m

	Rennet casein	Acid casein	Caseinates
Maximum milkfat	2.0% m/m	2.0% m/m	2.0% m/m
Ash (including P_2O_5)	7.5% m/m (min.)	2.5% m/m (max.)	–
Maximum lactose[(c)]	1.0% m/m	1.0% m/m	1.0% m/m
Maximum free acid	–	0.27 ml 0.1 N NaOH/g	–
Maximum pH value	–	–	8.0

(a) Protein content is 6.38 multiplied by the total Kjeldahl nitrogen determined.
(b) The water content does not include water of crystallization of the lactose.
(c) Although the products may contain both anhydrous lactose and lactose monohydrate, the lactose content is expressed as anhydrous lactose. 100 parts of lactose monohydrate contain 95 parts of anhydrous lactose.

In accordance with the provision of section 4.3.3 of the *General Standard for the Use of Dairy Terms*, edible casein products may be modified in composition to meet the desired end-product composition. However, compositional modifications beyond the minima or maxima specified above for milk protein in dry matter, casein, water, milkfat, lactose and free acid are not considered to be in compliance with the Section 4.3.3.

4. FOOD ADDITIVES

Only those additives listed below may be used within the limits specified.

Caseinates

INS no.	Name of additive	Maximum level
Acidity regulators		
261(i)	Potassium acetate	Limited by GMP
262(i)	Sodium acetate	
263	Calcium acetate	
325	Sodium lactate	
326	Potassium lactate	
327	Calcium lactate	
328	Ammonium lactate	
329	Magnesium lactate (DL-)	
452	Polyphosphates	5 g/kg singly or in combination expressed as P_2O_5*
Neutralizing agents		
331	Sodium citrates	Limited by GMP
332	Potassium citrates	
333	Calcium citrates	
345	Magnesium citrate	
380	Ammonium citrates	

INS no.	Name of additive	Maximum level
339	Sodium phosphates	10 g/kg singly or in combination expressed as P_2O_5*
340	Potassium phosphates	
341	Calcium phosphates	
342	Ammonium phosphates	
343	Magnesium phosphates	
170	Calcium carbonates	Limited by GMP
500	Sodium carbonates	
501	Potassium carbonates	
503	Ammonium carbonates	
504	Magnesium carbonates	
524	Sodium hydroxide	
525	Potassium hydroxide	
526	Calcium hydroxide	
527	Ammonium hydroxide	
528	Magnesium hydroxide	
Emulsifiers		
322	Lecithins	Limited by GMP
471	Mono- and di-glycerides of fatty acids	
Bulking agents		
325	Sodium lactate	Limited by GMP
Anti-caking agents		
170(i)	Calcium carbonate	10 g/kg singly or in combination *
341(iii)	Tricalcium orthophosphate	
343(iii)	Trimagnesium orthophosphate	
460	Cellulose	
504(i)	Magnesium carbonate	
530	Magnesium oxide	
551	Silicon dioxide, amorphous	
552	Calcium silicate	
553	Magnesium silicates	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	
1442	Hydroxypropyl distach phosphate	

* Total amount of P_2O_5 shall not exceed 10 g/kg.

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with those maximum residues limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Edible acid casein
Edible caseinate
Edible rennet casein

} According to the descriptions in Section 2 and the compositions in Section 3.3.

The name of edible caseinate shall be accompanied by an indication of the cation used.

7.2 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

INFORMATION ON USUAL PATTERNS OF MANUFACTURING EDIBLE CASEIN PRODUCTS

This text below is intended for voluntary application by commercial partners and not for application by governments.

1. OTHER QUALITY FACTORS

1.1 Physical appearance

White to pale cream; free from lumps which do not break up under slight pressure.

1.2 Flavour and odour

Not more than slight foreign flavours and odours. The product must be free from offensive flavours and odours.

2. PROCESSING AIDS

Acids used for precipitation purposes:

INS no.	Name
260	Acetic acid, glacial
270	Lactic acid (L-, D- and DL-)
330	Citric acid
338	Orthophosphoric acid
507	Hydrochloric acid
513	Sulphuric acid
For renneting enhancement purposes:	
509	Calcium chloride

3. ADDITIONAL QUALITY FACTORS

	Rennet casein	Acid casein	Caseinates
Maximum sediment (scorched particles)	15 mg/25g	22.5 mg/25g	22.5 mg/25g (spray dried) 81.5 mg/25g (roller dried)

Heavy metals

The following limits apply:

Metal	Maximum limit
Copper	5 mg/kg
Iron	20 mg/kg (50 mg/kg in roller dried caseinates)

4. ADDITIONAL METHODS OF ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR MILK POWDERS AND CREAM POWDER[1]

CODEX STAN 207-1999

1. SCOPE

This Standard applies to milk powders and cream powder, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Milk powders and cream powder are milk products which can be obtained by the partial removal of water from milk or cream. The fat and/or protein content of the milk or cream may have been adjusted, only to comply with the compositional requirements in Section 3 of this Standard, by the addition and/or withdrawal of milk constituents in such a way as not to alter the whey protein to casein ratio of the milk being adjusted.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and cream

The following milk products are allowed for protein adjustment purposes:

- Milk retentate — Milk retentate is the product obtained by concentrating milk protein by ultrafiltration of milk, partly skimmed milk, or skimmed milk;
- Milk permeate — Milk permeate is the product obtained by removing milk proteins and milkfat from milk, partly skimmed milk, or skimmed milk by ultrafiltration; and
- Lactose *.

* For specification, see relevant Codex standard.

3.2 Composition

Cream powder

Minimum milkfat	42% m/m
Maximum water**	5% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

[1] This Standard replaced the Standard for Whole Milk Powder, Partly Skimmed Milk Powder and Skimmed Milk Powder (A-5-1971) and the Standard for Cream Powder, Half Cream Powder and High Fat Milk Powder (A-10-1971).

Whole milk powder

Milkfat	Minimum 26% and less than 42% m/m
Maximum water**	5% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Partly skimmed milk powder

Milkfat	More than 1.5% and less than 26% m/m
Maximum water**	5% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

Skimmed milk powder

Maximum milkfat	1.5% m/m
Maximum water**	5% m/m
Minimum milk protein in milk solids-not-fat**	34% m/m

** The water content does not include water of crystallization of the lactose; the milk solids-not-fat content includes water of crystallization of the lactose.

4. FOOD ADDITIVES

Only those food additives listed below may be used and only within the limits specified.

INS no.	Nameof additive	Maximum level
Stabilizers		
331	Sodium citrates	5 g/kg singly or in combination, expressed as anhydrous substances
332	Potassium citrates	
Firming agents		
508	Potassium chloride	Limited by GMP
509	Calcium chloride	Limited by GMP
Acidity regulators		
339	Sodium phosphates	5 g/kg singly or in combination expressed as anhydrous substances
340	Potassium phosphates	
450	Diphosphates	
451	Triphosphates	
452	Polyphosphates	
500	Sodium carbonates	
501	Potassium carbonates	
Emulsifiers		
322	Lecithins (or phospholipids from natural sources)	Limited by GMP
471	Mono- and diglycerides of fatty acids	2.5 g/kg

INS no.	Nameof additive	Maximum level
Anticaking agents		
170(i)	Calcium carbonate	10 g/kg singly or in combination
341(iii)	Tricalcium orthophosphate	
343(iii)	Trimagnesium orthophosphate	
504(i)	Magnesium carbonate	
530	Magnesium oxide	
551	Silicon dioxide, amorphous	
552	Calcium silicate	
553	Magnesium silicates	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	
Antioxidants		
300	L-Ascorbic acid	0.5 g/kg expressed as ascorbic acid
301	Sodium ascorbate	
304	Ascorbyl palmitate	
320	Butylated hydroxyanisole (BHA)	0.01% m/m

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of* Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

Cream powder
Whole milk powder
Partly skimmed milk powder
Skimmed milk powder

} according to the composition in Section 3.2

Partly skimmed milk powder may be designated "Semi-skimmed milk powder" provided that the content of milkfat does not exceed 16% m/m and is not less than 14% m/m.

If allowed by national legislation or otherwise identified to the consumer in the country where the product is sold, "whole milk powder" may be designated "full cream milk powder" and "skimmed milk powder" may be designated "low fat milk powder".

7.2 Declaration of milkfat content

If the consumer would be misled by the omission, the milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.3 Declaration of milk protein

If the consumer would be misled by the omission, the milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either as (i) a percentage by mass, or (ii) grams per serving as quantified in the label provided the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), milk products used only for protein adjustment need not be declared.

7.5 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

ANNEX

This text is intended for voluntary application by commercial partners and not for application by governments.

Additional quality factors

Requirements	Whole milk powder	Partially skimmed milk powder	Skimmed milk powder	Method
Titratable acidity	max 18.0	max 18.0	max 18.0	IDF Standard 86:1981
(ml-0.1 N NaOH/ 10 g-solids-not-fat)				IDF Standard 81:1981
Scorched particles	max Disc B	max Disc B	max Disc B	IDF Standard 107A:1995
Solubility index (ml)	max 1.0	max 1.0	max 1.0	IDF Standard 129A:1988

CODEX STANDARD FOR A BLEND OF EVAPORATED SKIMMED MILK AND VEGETABLE FAT

CODEX STAN 250-2006

1. SCOPE

This Standard applies to a blend of evaporated skimmed milk and vegetable fat, also known as a blend of unsweetened condensed skimmed milk and vegetable fat, which is intended for direct consumption, or further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

A blend of evaporated skimmed milk and vegetable fat is a product prepared by recombining milk constituents and potable water, or by the partial removal of water and the addition of edible vegetable oil, edible vegetable fat or a mixture thereof, to meet the compositional requirements in Section 3 of this Standard.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Skimmed milk and skimmed milk powders[1], other non-fat milk solids, and edible vegetable fats/oils.[1]

The following milk products are allowed for protein adjustment purposes :

- Milk retentate — Milk retentate is the product obtained by concentrating milk protein by ultra-filtration of milk, partly skimmed milk, or skimmed milk;
- Milk permeate — Milk permeate is the product obtained by removing milk protein and milk fat from milk, partly skimmed milk, or skimmed milk by ultra-filtration; and
- Lactose [1]

3.2 Permitted ingredients

- Potable water
- Sodium chloride and/or potassium chloride as salt substitute

3.3 Permitted nutrients

Where allowed in accordance with the *Codex General Principles for the Addition of Essential Nutrients for Food* (CAC/GL 09-1987), maximum and minimum levels for

[1] For specification, see relevant Codex Standard.

Vitamins A, D and other nutrients, where appropriate, should be laid down by national legislation in accordance with the needs of individual country including, where appropriate, the prohibition of the use of particular nutrients.

3.4 Composition

Blend of evaporated skimmed milk and vegetable fat

Minimum total fat	7.5% m/m
Minimum milk solids-not-fat[2]	17.5% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

Reduced fat blend of evaporated skimmed milk and vegetable fat

Total fat	More than 1% and less than 7.5% m/m
Minimum milk solids-not-fat[2]	19% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

4. FOOD ADDITIVES

The following provisions are subject to endorsement by the Codex Committee on Food Additives and Contaminants and to incorporation into the *General Standard for Food Additives*.

Only food additives listed below may be used and only within the limits specified.

INS no.	Name of additive	Maximum level
Emulsifiers		
322	Lecithins	Limited by GMP
Stabilizers		
331(i)	Sodium dihydrogen citrate	Limited by GMP
331(iii)	Trisodium citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
332(ii)	Tripotassium citrate	Limited by GMP
333	Calcium citrate	Limited by GMP
508	Potassium chloride	Limited by GMP
509	Calcium chloride	Limited by GMP
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP

[2] The milk solids-not-fat content includes water of crystallization of the lactose.

INS no.	Name of additive	Maximum level
339(i)	Monosodium orthophosphate	4 400 mg/kg, singly or in combination as phosphorous
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
341(iii)	Tricalcium orthophosphate	
450(i)	Disodium diphosphate	
450(ii)	Trisodium diphosphate	
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
450(vii)	Calcium dihydrogen diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iii)	Sodium calcium polyphosphate	
452(iv)	Calcium polyphosphates	
452(v)	Ammonium polyphosphates	
500(i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonates	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
Thickeners		
407	Carrageenan and its Na, K, NH_4, Ca and Mg salts (including furcelleran)	Limited by GMP
407a	Processed Eucheuma seaweed	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The

products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provision of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) the following specific provisions apply.

7.1 Name of the food

The name of the food shall be:

- Blend of Evaporated Skimmed Milk and Vegetable Fat; or
- Reduced Fat Blend of Evaporated Skimmed Milk and Vegetable Fat

Other names may be used if allowed by national legislation in the country of retail sale.

7.2 Declaration of total fat content

The total fat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

A statement shall appear on the label as to the presence of edible vegetable fat and/or edible vegetable oil. When required by the country of retail sale, the common name of the vegetable from which the fat or oil is derived shall be included in the name of the food or as a separate statement.

7.3 Declaration of milk protein

The milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) milk products used only for protein adjustment need not be declared.

7.5 Advisory statement

A statement shall appear on the label to indicate that the product should not be used as a substitute for infant formula. For example, "NOT SUITABLE FOR INFANTS".

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR A BLEND OF SKIMMED MILK AND VEGETABLE FAT IN POWDERED FORM

CODEX STAN 251-2006

1. SCOPE

This Standard applies to a blend of skimmed milk and vegetable fat in powdered form, intended for direct consumption, or further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

A blend of skimmed milk and vegetable fat in powdered form is a product prepared by the partial removal of water from milk constituents with the addition of edible vegetable oil, edible vegetable fat or a mixture thereof, to meet the compositional requirements in Section 3 of this Standard.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Skimmed milk and skimmed milk powders[1], other non-fat milk solids, and edible vegetable oils/ fats.[1]

The following milk products are allowed for protein adjustment purposes:

- Milk retentate Milk retentate is the product obtained by concentrating milk protein by ultrafiltration of milk, partly skimmed milk, or skimmed milk;
- Milk permeate Milk permeate is the product obtained by removing milk proteins and milk fat from milk, partly skimmed milk or skimmed milk by ultrafiltration; and
- Lactose 1

3.2 Permitted nutrients

Where allowed in accordance with the *Codex General Principles for the Addition of Essential Nutrients for Food* (CAC/GL 09-1987), maximum and minimum levels for Vitamins A, D and other nutrients, where appropriate, should be laid down by national legislation in accordance with the needs of individual country including, where appropriate, the prohibition of the use of particular nutrients.

3.3 Composition

Blend of skimmed milk and vegetable fat in powdered form

Minimum total fat	26% m/m

[1] For specification, see relevant Codex Standard.

Maximum water[2]	5% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

Reduced fat blend of skimmed milk powder and vegetable fat in powdered form

Total fat	More than 1.5% and less than 26% m/m
Maximum water[2]	5% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

4. FOOD ADDITIVES

The following provisions are subject to endorsement by the Codex Committee on Food Additives and Contaminants and to incorporation into the *General Standard for Food Additives*.

Only those food additives listed below may be used and only within limits specified.

INS no.	Name of additive	Maximum level
Stabilizers		
331(i)	Sodium dihydrogen citrate	Limited by GMP
331(iii)	Trisodium citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
332(ii)	Tripotassium citrate	Limited by GMP
508	Potassium chloride	Limited by GMP
509	Calcium chloride	Limited by GMP
Acidity regulators		
339(i)	Monosodium orthophosphate	4 400 mg/kg, singly or in combination as phosphorous
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
450(i)	Disodium diphosphate	
450(ii)	Trisodium diphosphate	
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
450(vii)	Calcium dihydrogen diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iii)	Sodium calcium polyphosphate	
452(iv)	Calcium polyphosphates	
452(v)	Ammonium polyphosphates	
500(i)	Sodium carbonate	Limited by GMP

[2] The milk solids and milk solids-not-fat contents include water of crystallization of the lactose.

INS no.	Name of additive	Maximum level
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonates	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
Emulsifiers		
322	Lecithins	Limited by GMP
471	Mono- and diglycerides of fatty acids	Limited by GMP
Anticaking agents		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
530	Magnesium oxide	Limited by GMP
551	Silicon dioxide	Limited by GMP
552	Calcium silicate	Limited by GMP
553(i)	Magnesium silicate	Limited by GMP
553(iii)	Talc	Limited by GMP
554	Sodium aluminosilicate	Limited by GMP
556	Calcium aluminum silicate	Limited by GMP
559	Aluminum silicate	Limited by GMP
341(iii)	Tricalcium orthophosphate	4 400 mg/kg, singly or in combination as phosphorous
343(iii)	Trimagnesium orthophosphate	
Antioxidants		
300	Ascorbic acid	500 mg/kg as ascorbic acid
301	Sodium ascorbate	
304	Ascorbyl palmitate	80 mg/kg, singly or in combination as ascorbyl stearate
305	Ascorbyl stearate	
320	BHA	100 mg/kg singly or in combination. Expressed on fat or oil basis
321	BHT	
319	TBHQ	

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance

with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) the following specific provisions apply:

7.1 Name of the food

The name of the food shall be:

- Blend of Skimmed Milk and Vegetable Fat in Powdered Form; or
- Reduced Fat Blend of Skimmed Milk and Vegetable Fat in Powdered Form.

Other names may be used if allowed by national legislation in the country of retail sale.

7.2 Declaration of total fat content

The total fat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

A statement shall appear on the label as to the presence of edible vegetable fat and/or edible vegetable oil. When required by the country of retail sale, the common name of the vegetable from which the fat or oil is derived shall be included in the name of the food or as a separate statement.

7.3 Declaration of milk protein

The milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) milk products used only for protein adjustment need not be declared.

7.5 Advisory Statement

A statement shall appear on the label to indicate that the product should not be used as a substitute for infant formula. For example, "NOT SUITABLE FOR INFANTS".

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR A BLEND OF SWEETENED CONDENSED SKIMMED MILK AND VEGETABLE FAT

CODEX STAN 252-2006

1. SCOPE

This Standard applies to a blend of sweetened condensed skimmed milk and vegetable fat, intended for direct consumption, or further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

A blend of sweetened condensed skimmed milk and vegetable fat is a product prepared by recombining milk constituents and potable water, or by the partial removal of water, with the addition of sugar and with the addition of edible vegetable oil, edible vegetable fat or a mixture thereof to meet the compositional requirements in Section 3 of this Standard.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Skimmed milk and skimmed milk powders[1], other non-fat milk solids, and edible vegetable fats/oils[1].

The following milk products are allowed for protein adjustment purposes:

- Milk retentate — Milk retentate is the product obtained by concentrating milk protein by ultra-filtration of milk, partly skimmed milk, or skimmed milk;
- Milk permeate — Milk permeate is the product obtained by removing milk protein and milk fat from milk, partly skimmed milk, or skimmed milk by ultra-filtration; and
- Lactose[1] — (Also for seeding purposes)

3.2 Permitted ingredients

- Potable water
- Sugar
- Sodium chloride and/or potassium chloride as salt substitute

In this product, sugar is generally considered to be sucrose, but a combination of sucrose with other sugars, consistent with Good Manufacturing Practice, may be used.

[1] For specification, see relevant Codex Standard.

3.3 Permitted nutrients

Where allowed in accordance with the *Codex General Principles for the Addition of Essential Nutrients for Food* (CAC/GL 09-1987), maximum and minimum levels for Vitamins A, D and other nutrients, where appropriate, should be laid down by national legislation in accordance with the needs of individual country including, where appropriate, the prohibition of the use of particular nutrients.

3.4 Composition

Blend of sweetened condensed skimmed milk and vegetable fat

Minimum total fat	8% m/m
Minimum milk solids-not-fat [2]	20% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

Reduced fat blend of sweetened condensed skimmed milk and vegetable fat

Total fat	More than 1% and less than 8% m/m
Minimum milk solids-not-fat [2]	20% m/m
Minimum milk protein in milk solids-not-fat[2]	34% m/m

For a blend of sweetened condensed skimmed milk and vegetable fat the amount of sugar is restricted by Good Manufacturing Practice to a minimum value which safeguards the keeping quality of the product and a maximum value above which crystallization of sugar, may occur.

4. FOOD ADDITIVES

The following provisions are subject to endorsement by the Codex Committee on Food Additives and Contaminants and to incorporation into the *General Standard for Food Additives*.

Only those food additives listed below may be used and only within the limits specified.

INS no.	Name of additive	Maximum level
Emulsifiers		
322	Lecithins	Limited by GMP
Stabilizers		
331(i)	Sodium dihydrogen citrate	Limited by GMP
331(iii)	Trisodium citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
332(ii)	Tripotassium citrate	Limited by GMP
333	Calcium citrate	Limited by GMP
508	Potassium chloride	Limited by GMP
509	Calcium chloride	Limited by GMP

[2] The milk solids-not-fat contents include water of crystallization of the lactose.

INS no.	Name of additive	Maximum level
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
339(i)	Monosodium orthophosphate	4 400 mg/kg, singly or in combination as phosphorous
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
341(iii)	Tricalcium orthophosphate	
450(i)	Disodium diphosphate	
450(ii)	Trisodium diphosphate	
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
450(vii)	Calcium dihydrogen diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iii)	Sodium calcium polyphosphate	
452(iv)	Calcium polyphosphates	
452(v)	Ammonium polyphosphates	
500(i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonates	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
Thickeners		
407	Carrageenan and its Na, K, NH_4, Ca and Mg salts (including furcelleran)	Limited by GMP
407a	Processed Eucheuma seaweed	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other

relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) the following specific provisions apply :

7.1 Name of the food

The name of the food shall be:

- Blend of Sweetened Condensed Skimmed Milk and Vegetable Fat; or
- Reduced Fat Blend of Sweetened Condensed Skimmed Milk and Vegetable Fat

Other names may be used if allowed by national legislation in the country of retail sale.

7.2 Declaration of total fat content

The total fat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

A statement shall appear on the label as to the presence of edible vegetable fat and/or edible vegetable oil. Where required by the country of retail sale, the common name of the vegetable from which the fat or oil is derived shall be included in the name of the food or as a separate statement.

7.3 Declaration of milk protein

The milk protein content shall be declared in a manner acceptable in the country of sale to the final consumer, either (i) as a percentage by mass or volume, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

7.4 List of ingredients

Notwithstanding the provision of Section 4.2.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) milk products used only for protein adjustment need not be declared.

7.5 Advisory statement

A statement shall appear on the label to indicate that the product should not be used as a substitute for infant formula. For example, "NOT SUITABLE FOR INFANTS".

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR DAIRY FAT SPREADS

CODEX STAN 253-2006

1. SCOPE

This Standard applies to dairy fat spreads intended for use as spreads for direct consumption, or for further processing, in conformity with section 2 of this Standard.

2. DESCRIPTION

Dairy fat spreads are milk products relatively rich in fat in the form of a spreadable emulsion principally of the type of water-in-milk fat that remains in solid phase at a temperature of 20°C.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

– Milk and/or products obtained from milk.

Raw materials, including milk fat, may have been subjected to any appropriate processing (e.g. physical modifications including fractionation) prior to its use.

3.2 Permitted Ingredients

The following substances may be added:

– Flavours and flavourings;
– Safe and suitable processing aids;
– Where allowed in accordance with the *Codex General Principles for the Addition of Essential Nutrients for Food*[1], maximum and minimum levels for vitamins A, D and other nutrients, where appropriate, should be laid down by national legislation in accordance with the needs of individual countries including, where appropriate, the prohibition of the use of particular nutrients;
– Sodium chloride and potassium chloride as a salt substitute;
– Sugars (any carbohydrate sweetening matter);
– Inulin and malto-dextrins (limited by GMP);
– Starter cultures of harmless lactic acid and/or flavour producing bacteria;
– Water;
– Gelatine and Starches (limited by GMP). These substances can be used in the same function as thickeners, provided they are added only in amounts functionally necessary as governed by GMP taking into account any use of the thickeners listed in section 4.

[1] CAC/GL 09-1987.

3.3 Composition

The milk fat content shall be no less than 10% and less than 80% (m/m) and shall represent at least 2/3 of the dry matter.

Compositional modifications of Dairy Fat Spreads are restricted by the requirements of section 4.3.3 of the *General Standard for the Use of Dairy Terms*.

4. FOOD ADDITIVES

Only those additive functional classes indicated as technologically justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below the table may be used and only within the functions and limits specified.

Additive functional class	Justified use in dairy fat spreads:	
	< 70% milk fat content*	≥ 70% milk fat content
Acids	X	X
Acidity regulators	X	X
Anticaking agents	–	–
Antifoaming agents	X	X
Antioxidants	X	X
Bleaching agents	–	–
Bulking agents	–	–
Carbonating agents	–	–
Colours	X	X
Colour retention agents	–	–
Emulsifiers	X	–
Firming agents	–	–
Flavour enhancers	X	–
Foaming agents	–	–
Gelling agents	–	–
Humectants	–	–
Preservatives	X	X
Propellants	X	X
Raising agents	–	–
Sequestrants	–	–
Stabilizers	X	–
Thickeners	X	–

* The application of GMP in the use of emulsifiers, stabilizers, thickeners and flavour enhancers includes consideration of the fact that the amount required to obtain the technological function in the product decreases with increasing fat content, fading out at fat content about 70%.

INS no.	Name of additive	Maximum level
Colours		
100(i)	Curcumin	5 mg/kg
160a(i)	beta-Carotene (Synthetic)	35 mg/kg, singly or in combination
160a(ii)	Beta-Carotene (*Blakeslea triaspora*)	
160e	beta-apo-Carotenal	
160f	beta-apo-8'-carotenoic acid, methyl or ethyl ester	
Emulsifiers		
432	Polyoxyethylene (20) sorbitan monolaurate	10 000 mg/kg, singly or in combination (Dairy fat spreads for baking purposes only)
433	Polyoxyethylene (20) sorbitan monooleate	
434	Polyoxyethylene (20) sorbitan monopalmitate	
435	Polyoxyethylene (20) sorbitan monostearate	
436	Polyoxyethylene (20) sorbitan tristearate	
471	Mono and diglycerides of fatty acids	Limited by GMP
472a	Acetic and fatty acid esters of glycerol	Limited by GMP
472b	Lactic and fatty acid esters of glycerol	Limited by GMP
472c	Citric and fatty acid esters of glycerol	Limited by GMP
472e	Diacetyltartaric and fatty acid esters of glycerol	10 000 mg/kg
473	Sucrose esters of fatty acids	10 000 mg/kg, dairy fat spreads for baking purposes only.
474	Sucroglycerides	10 000 mg/kg, dairy fat spreads for baking purposes only.
475	Polyglycerol esters of fatty acids	5 000 mg/kg
476	Polyglycerol esters of interesterified ricinoleic acid	4 000 mg/kg
481(i)	Sodium stearoyl lactylate	10 000 mg/kg, singly or in combination
482(i)	Calcium stearoy lactylate	
491	Sorbitan monostearate	10 000 mg/kg, singly or in combination
492	Sorbitan tristearate	
493	Sorbitan monolaurate	
494	Sorbitan monooleate	
495	Sorbitan monopalmitate	
Preservatives		
200	Sorbic acid	2 000 mg/kg, singly or in combination (as sorbic acid) for fat contents < 59% and 1 000 mg/kg singly or in combination (as sorbic acid) for fat contents ≥ 59%
201	Sodium Sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
Stabilizers/thickeners		
340 (i)	Monopotassium orthophosphate	880 mg/kg, singly or in combination, as phosphorous
340 (ii)	Dipotassium orthophosphate	
340 (iii)	Tripotassium orthosphosphate	
341 (i)	Monocalcium orthosphosphate	
341 (ii)	Dicalcium orthosphosphate	
341 (iii)	Tricalcium orthophosphate	
450 (i)	Disodium diposphate	
400	Alginic acid	Limited by GMP
401	Sodium alginate	Limited by GMP
402	Potassium alginate	Limited by GMP

INS no.	Name of additive	Maximum level
403	Ammonium alginate	Limited by GMP
404	Calcium alginate	Limited by GMP
406	Agar	Limited by GMP
405	Propylene glycol alginate	3 000 mg/kg
407	Carrageenan and its Na, K , NH_4, Ca and Mg salts (including furcelleran)	Limited by GMP
407a	Processed Euchema seaweed	Limited by GMP
410	Carob bean gum	Limited by GMP
412	Guar gum	Limited by GMP
413	Tragacanth gum	Limited by GMP
414	Gum arabic	Limited by GMP
415	Xanthan gum	Limited by GMP
418	Gellan gum	Limited by GMP
422	Glycerol	Limited by GMP
440	Pectins	Limited by GMP
460 (i)	Microcrystalline cellulose	Limited by GMP
460 (ii)	Powdered cellulose	Limited by GMP
461	Methyl cellulose	Limited by GMP
463	Hydroxypropyl cellulose	Limited by GMP
464	Hydroxypropyl methyl cellulose	Limited by GMP
465	Methyl ethyl cellulose	Limited by GMP
466	Sodium carboxymethyl cellulose	Limited by GMP
500 (i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500 (iii)	Sodium sesquicarbonate	Limited by GMP
1400	Dextrin, roasted starch white and yellow	Limited by GMP
1401	Acid-treated starch	Limited by GMP
1402	Alkaline-treated starch	Limited by GMP
1403	Bleached starch	Limited by GMP
1404	Oxidized starch	Limited by GMP
1405	Starches, enzyme treated	Limited by GMP
1410	Monostarch phosphate	Limited by GMP
1412	Distarch phosphate esterified with Sodium trimetaphospahte; esterified with phosphorous oxychloride	Limited by GMP
1413	Phosphated distarch phosphate	Limited by GMP
1414	Acetylated distarch phosphate	Limited by GMP
1420	Starch acetate esterified with acetic anhydride	Limited by GMP
1422	Acetylated distarch adipate	Limited by GMP
1440	Hydroxypropyl starch	Limited by GMP
1442	Hydroxypropyl distarch phosphate	Limited by GMP
Acidity regulators		
325	Sodium lactate	Limited by GMP
326	Potassium lactate	Limited by GMP
327	Calcium lactate	Limited by GMP
329	Magnesium lactate	Limited by GMP
331(i)	Sodium dihydrogen citrate	Limited by GMP
331(ii)	Disodium monohydrogen citrate	Limited by GMP

INS no.	Name of additive	Maximum level
334	Tartaric acid (L(+))	5 000 mg/kg, singly or in combination as tartaric acid
335 (i)	Monosodium tartrate	
335 (ii)	Disodium tartrate	
336 (i)	Monopotassium tartrate	
336 (ii)	Dipotassium tartrate	
337	Potassium sodium tartrate	
339 (i)	Monosodium orthophosphate	880 mg/kg, singly or in combination as phosphorous
339 (ii)	Disodium orthophosphate	
339 (iii)	Trisodium orthophosphate	
338	Orthophosphoric acid	
524	Sodium hydroxide	Limited by GMP
526	Calcium hydroxide	Limited by GMP
Antioxidants		
304	Ascorbyl palmitate	500 mg/kg, as ascorbyl stearate
305	Ascorbyl stearate	
306	Mixed tocopherols concentrate	500 mg/kg
307	alpha-Tocopherol	
310	Propyl gallate	200 mg/kg, singly or in combination: Butylated Hydroxyanisole (BHA, INS 320), Butylated Hydroxytoluene (BHT, INS 321), and Propyl Gallate (INS 310) as a combined maximum level of 200 mg/kg on a fat or oil basis. May be used only in dairy fat spreads intended for cooking purposes.
320	Butylated hydroxyanisole	200 mg/kg, singly or in combination: Butylated Hydroxyanisole (BHA, INS 320), Butylated Hydroxytoluene (BHT, INS 321), and Propyl Gallate (INS 310) as a combined maximum level of 200 mg/kg on a fat or oil basis. May be used only in dairy fat spreads intended for cooking purposes.
321	Butylated hydroxytoluene	75 mg/kg, singly or in combination: Butylated Hydroxyanisole (BHA, INS 320), Butylated Hydroxytoluene (BHT, INS 321), and Propyl Gallate (INS 310) as a combined maximum level of 200 mg/kg on a fat or oil basis. May be used only in dairy fat spreads intended for cooking purposes.
Anti-foaming agents		
900 a	Polydimethylsiloxane	10 mg/kg in dairy fat spreads for frying purposes, only
Flavour enhancers		
627	Disodium 5′-Guanylate	Limited by GMP
628	Dipotassium 5′-Guanylate	Limited by GMP

5. CONTAMINANTS

The milk used in the manufacture of the products covered by this Standard shall comply with the maximum limits for contaminants and the maximum limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

7.1.1 The name of the food shall be "Dairy Fat Spread" Other names may be used if allowed by national legislation in the country of retail sale.

7.1.2 Dairy fat spreads with reduced fat content may be labelled as "reduced fat" in line with the *Codex Guidelines for the Use of Nutrition and Health Claims*[2].

7.1.3 The designations and any qualifying terms should be translated into other languages in a non-misleading way and not necessarily word for word and should be acceptable in the country of retail sale.

7.1.4 Dairy fat spread may be labelled to indicate whether it is salted or unsalted according to national legislation.

7.1.5 Dairy fat spreads that have been sweetened shall be labelled to indicate that they have been sweetened.

7.2 Declaration of fat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale, either (i) as a percentage by mass, or (ii) in grams per serving as quantified in the label provided that the number of servings is stated.

[2] CAC-GL 23-1997.

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable on the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX GENERAL STANDARD FOR CHEESE

CODEX STAN A-6-1978, Rev.1-1999, Amended 2006

1. SCOPE

This Standard applies to all products, intended for direct consumption or further processing, in conformity with the definition of cheese in Section 2 of this Standard. Subject to the provisions of this Standard, standards for individual varieties of cheese, or groups of varieties of cheese, may contain provisions which are more specific than those in this Standard and in these cases, those specific provisions shall apply.

2. DESCRIPTION

2.1 Cheese is the ripened or unripened soft, semi-hard, hard, or extra-hard product, which may be coated, and in which the whey protein/casein ratio does not exceed that of milk, obtained by:

(a) coagulating wholly or partly the protein of milk, skimmed milk, partly skimmed milk, cream, whey cream or buttermilk, or any combination of these materials, through the action of rennet or other suitable coagulating agents, and by partially draining the whey resulting from the coagulation, while respecting the principle that cheese-making results in a concentration of milk protein (in particular, the casein portion), and that consequently, the protein content of the cheese will be distinctly higher than the protein level of the blend of the above milk materials from which the cheese was made; and/or

(b) processing techniques involving coagulation of the protein of milk and/or products obtained from milk which give an end-product with similar physical, chemical and organoleptic characteristics as the product defined under (a).

2.1.1 Ripened cheese is cheese which is not ready for consumption shortly after manufacture but which must be held for such time, at such temperature, and under such other conditions as will result in the necessary biochemical and physical changes characterizing the cheese in question.

2.1.2 Mould ripened cheese is a ripened cheese in which the ripening has been accomplished primarily by the development of characteristic mould growth throughout the interior and/or on the surface of the cheese.

2.1.3 Unripened cheese including fresh cheese is cheese which is ready for consumption shortly after manufacture.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/or flavour producing bacteria and cultures of other harmless microorganisms
- Safe and suitable enzymes
- Sodium chloride
- Potable water

4. FOOD ADDITIVES

Only those food additives listed below may be used and only within the limits specified.

Unripened cheeses
As listed in the *Codex Standard for Unripened Cheese Including Fresh Cheese*.

Cheeses in brine
As listed in the *Codex Standard for Cheeses in Brine* (CODEX STAN 208-1999).

Ripened cheeses, including mould ripened cheeses
Additives not listed below but provided for in Codex individual standards for varieties of ripened cheeses may also be used for similar types of cheese within the limits specified within those standards.

INS no.	Name of additive	Maximum level
Colours		
100	Curcumins (for edible cheese rind)	Limited by GMP
101	Riboflavins	Limited by GMP
120	Carmines (for red marbled cheeses only)	Limited by GMP
140	Chlorophylls (for green marbled cheeses only)	Limited by GMP
141	Copper chlorophylls	15 mg/kg
160a(i)	β-Carotene (synthetic)	25mg/kg
160a(ii)	Carotenes (natural extracts)	600 mg/kg
160b	Annatto extracts normal coloured orange coloured deep orange coloured	 10 mg/kg (on bixin/norbixin basis) 25 mg/kg (on bixin/norbixin basis) 50 mg/kg (on bixin/norbixin basis)
160c	Paprika oleoresins	Limited by GMP
160e	β-apo-Carotenal	35 mg/kg
160f	β-apo-8'-Carotenoic acid, methyl or ethyl ester	35 mg/kg
162	Beet red	Limited by GMP
171	Titanium dioxide	Limited by GMP
Acidity regulators		
170	Calcium carbonates	Limited by GMP
504	Magnesium carbonates	
575	Glucono delta-lactone	

INS no.	Name of additive	Maximum level
Preservatives		
200	Sorbic acid	3 000 mg/kg calculated as sorbic acid
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
239	Hexamethylene tetramine (Provolone only)	25 mg/kg, expressed as formaldehyde
251	Sodium nitrate	50 mg/kg, expressed as $NaNO_3$
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg, calculated as propionic acid
281	Sodium propionate	
282	Calcium propionate	
1105	Lysozyme	Limited by GMP
For surface/rind treatment only:		
200	Sorbic acid	1 g/kg singly or in combination, calculated as sorbic acid
202	Potassium sorbate	
203	Calcium sorbate	
235	Pimaricin (natamycin)	2 mg/dm^2 of surface. Not present in a depth of 5 mm
Miscellaneous additive		
508	Potassium chloride	Limited by GMP
Sliced, cut, shredded or grated cheese		
Anti-caking agents		
460	Cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 g/kg singly or in combination. Silicates calculated as silicon dioxide
552	Calcium silicate	
553	Magnesium silicates	
554	Sodium aluminosilicate	
555	Potassium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	
560	Potassium silicate	
Preservatives		
200	Sorbic acid	1 g/kg singly or in combination, calculated as sorbic acid
202	Potassium sorbate	
203	Calcium sorbate	

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by the provisions of this standard shall comply with those maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be cheese. However, the word "cheese" may be omitted in the designation of an individual cheese variety reserved by a Codex standard for individual cheeses, and, in the absence thereof, a variety name specified in the national legislation of the country in which the product is sold, provided that the omission does not create an erroneous impression regarding the character of the food.

7.1.1 In case the product is not designated with a variety name but with the designation "cheese" alone, the designation may be accompanied by the appropriate descriptive terms in the following table:

DESIGNATION ACCORDING TO FIRMNESS AND RIPENING CHARACTERISTICS		
According to firmness: Term 1		According to principal ripening: Term 2
MFFB%	Designation	
< 51	Extra hard	Ripened
49–56	Hard	Mould ripened
54–69	Firm/Semi-hard	Unripened/Fresh
> 67	Soft	In Brine

MFFB equals percentage moisture on a fat-free basis, i.e.,

$$\frac{\text{Weight of moisture in the cheese}}{\text{Total weight of cheese} - \text{Weight of fat in the cheese}} \times 100$$

Example:
The designation of a cheese with moisture on a fat-free basis of 57% which is ripened in a manner similar in which Danablu is ripened would be:

"Mould ripened firm cheese or firm mould ripened cheese."

7.2 Declaration of milkfat content

The milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label provided that the number of servings is stated.

Additionally, the following terms may be used:

High fat	(if the content of FDM is above or equal to 60%);
Full fat	(if the content of FDM is above or equal to 45% and less than 60%)
Medium fat	(if the content of FDM is above or equal to 25% and less than 45%)
Partially skimmed	(if the content of FDM is above or equal to 10% and less than 25%)
Skim	(if the content of FDM is less than 10%)

7.3 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of minimum durability need not be declared in the labelling of firm, hard and extra hard cheese which are not mould/soft-ripened and not intended to be purchased as such by the final consumer: in such cases the date of manufacture shall be declared.

7.4 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container, and in the absence of such a container on the cheese itself. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX[1]

CHEESE RIND

During ripening of the moulded cheese curd in natural creation or in environments in which the air humidity and, possibly, air composition are controlled, the outside of the cheese will develop into a semi-closed layer with a lower moisture content. This part of the cheese is called **rind**. The rind is constituted of cheese mass which, at the start of the ripening, is of the same composition as the internal part of the cheese. In may cases, the brining of cheese initiates the formation of rind. Due to the influence of the salt gradient in the brine, of oxygen, of drying out and of other reactions, the rind successively becomes of a somewhat different composition than the interior of the cheese and often presents a more bitter taste.

During or after ripening the cheese rind can be treated or can be naturally colonized with desired cultures of microorganisms, for instance *Penicillium candidum* or *Brevibacterium linens*. The resulting layer, in some cases referred to as **smear**, forms a part of the rind.

Rindless cheese is ripened by the use of a ripening film. The outer part of that cheese does not develop a rind with a lower moisture content although influence of light of course can cause some difference compared to the inner part.

CHEESE SURFACE

The term "**cheese surface**" is used for the outside layer of cheese or parts of cheese, even in the sliced, shredded or grated form. The term includes the outside of the whole cheese, disregarding whether a rind has been formed or not.

CHEESE COATINGS

Cheese can be coated prior to the ripening, during the ripening process or when the ripening has been finished. When a coating is used during ripening the purpose of the coating is to regulate the moisture content of the cheese and to protect the cheese against micro-organisms.

Coating of a cheese after the ripening has been finished is done to protect the cheese against microorganisms and other contamination, to protect the cheese from physical damage during transport and distribution and/or to give the cheese a specific appearance (e.g. coloured).

Coating can be distinguished very easily from rind, as coatings are made of non-cheese material, and very often it is possible to remove the coating again by brushing, rubbing or peeling it off.

[1] Amendment adopted by the 26th Session of the Codex Alimentarius Commission.

Cheese can be coated with:

- A film, very often polyvinylacetate, but also other artificial material or material composed of natural ingredients, which helps to regulate the humidity during ripening and protects the cheese against microorganisms (for example, ripening films).[2]
- A layer, mostly wax, paraffin or a plastic, which normally is impermeable to moisture, to protect the cheese after ripening against microorganisms and against physical damage during retail handling and, in some cases to contribute to the presentation of the cheese.

[2] Wheat gluten or wheat protein products should not be used for technological reasons e.g. coating or processing aids for foods which are gluten-free by nature – *Codex Standard for Wheat Protein Products including Wheat Gluten* (CODEX STAN 163-1987).

CODEX STANDARD FOR WHEY CHEESES

CODEX STAN A-7-1971, Rev. 2-2006

1. SCOPE

This Standard applies to all products intended for direct consumption or further processing, in conformity with the definition of whey cheeses in Section 2 of this Standard. Subject to the provisions of this Standard, Codex standards for individual varieties of whey cheeses may contain provisions which are more specific than those in this Standard.

2. DESCRIPTION

2.1 **Whey Cheeses** are solid, semi-solid, or soft products which are principally obtained through either of the following processes:

(1) the concentration of whey and the moulding of the concentrated product;

(2) the coagulation of whey by heat with or without the addition of acid.

In each case, the whey may be pre-concentrated prior to the further concentration of whey or coagulation of the whey proteins. The process may also include the addition of milk, cream, or other raw materials of milk origin before or after concentration or coagulation. The ratio of whey protein to casein in the product obtained through the coagulation of whey shall be distinctly higher than that of milk.

The product obtained through the coagulation of whey may either be ripened or unripened.

2.2 Whey Cheese obtained through the concentration of whey is produced by heat evaporation of whey, or a mixture of whey and milk, cream, or other raw materials of milk origin, to a concentration enabling the final cheese to obtain a stable shape. Due to their relatively high lactose content these cheeses are typically yellowish to brown in colour and possess a sweet, cooked, or caramelized flavour.

2.3 Whey Cheese obtained through the coagulation of whey is produced by heat precipitation of whey, or a mixture of whey and milk or cream, with or without the addition of acid. These whey cheeses have a relatively low lactose content and a white to yellowish colour.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

(1) For products obtained through the concentration of whey:
whey, cream, milk and other raw materials obtained from milk.

(2) For products obtained through the coagulation of whey:
whey, milk, cream and buttermilk.

3.2 Permitted ingredients

Only for use in products obtained by coagulation of whey:

- Sodium chloride
- Starter cultures of harmless lactic acid bacteria

Only for use in products obtained through the concentration of whey by heat treatment

- Sugars (limited by GMP)

3.3 Permitted nutrients

Where allowed in accordance with the *Codex General Principles for the Addition of Essential Nutrients for Food* (CAC/GL 9-1987), maximum and minimum levels for minerals and other nutrients, where appropriate, should be laid down by national legislation in accordance with the needs of individual country including, where appropriate, the prohibition of the use of particular nutrients.

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the *Codex General Standard for Food Additives* (CODEX STAN 192-1995) in Food Category 01.6.3 (Whey cheese) and 01.6.6 (Whey protein cheese) may be used in foods subject to this standard.

5. CONTAMINANTS

The products covered by this Standard shall comply with the maximum limits for contaminants and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be **whey cheese**. Where it is considered necessary for consumer information in the country of sale, a description of the nature of the product may be required. The words "whey cheese" may be omitted in the designation of an individual whey cheese variety reserved by a Codex standard for individual cheeses, and, in the absence thereof, a variety name specified in the national legislation of the country in which the product is sold, provided that the omission does not create an erroneous impression regarding the character of the food.

In case a whey cheese obtained through the co-agulation of whey is not designated by a variety name, but with the designation "whey cheese", the designation may be accompanied by a descriptive term such as provided for in Section 7.1.1 of the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Unripened whey cheese obtained through the concentration of whey may be designated according to the fat content as provided in Section 7.2.

7.2 Declaration of milk fat content

The milk fat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label provided that the number of servings is stated.

For cheeses obtained from the concentration of whey, the declaration of milk fat content may be combined with an indication of the fat content as follows:

Fat on the dry basis[1]	
Creamed whey cheese	minimum 33%
Whey cheese	minimum 10% and less than 33%
Skimmed whey cheese	less than 10%

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[1] The dry matter content of whey cheese includes water of crystallization of the lactose.

CODEX GENERAL STANDARD FOR NAMED VARIETY PROCESS(ED) CHEESE AND SPREADABLE PROCESS(ED) CHEESE

CODEX STAN A-8(a)-1978

1. DEFINITION

Named variety process(ed) cheese and spreadable process(ed) cheese are made by grinding, mixing, melting and emulsifying with the aid of heat and emulsifying agents one or more varieties of cheese, with or without the addition of foodstuffs in accordance with paragraph 2.

2. OPTIONAL INGREDIENTS

2.1 Cream, butter and butteroil may be added in quantities to ensure compliance with the minimum fat requirements.

2.2 Salt (sodium chloride).

2.3 Vinegar.

2.4 Spices and other vegetable seasonings in sufficient quantity to characterize the product.

2.5 For the purpose of flavouring the product, foods other than sugars, properly cooked or otherwise prepared, may be added in sufficient quantity to characterize the product provided these additions, calculated on the basis of dry matter, do not exceed one sixth of the weight of the total solids of the final product.

2.6 Cultures of harmless bacteria and enzymes.

3. FOOD ADDITIVES

	Maximum level in the final product
Emulsifiers	
Sodium, potassium and calcium salts of the mono-, di- and polyphosphoric acids Sodium, potassium and calcium salts of citric acid Citric acid and/or phosphoric acid with sodium hydrogen carbonate and/or calcium carbonate	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus
Acidifiers/pH controlling agents	
Citric acid Phosphoric acid Acetic acid Lactic acid Sodium hydrogen carbonate and/or calcium carbonate	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus
Colours	
Annatto[1]	600 mg/kg singly or in combination
Beta-carotene	
Chlorophyll including copper chlorophyll Riboflavin Oleoresin of paprika Curcumin	Limited by GMP
Preservatives	
Either sorbic acid and its sodium and potassium salts, or propionic acid and its sodium and calcium salts	3 g/kg singly or in combination expressed as the acids
Nisin	12.5 mg of pure nisin per kg

4. HEAT TREATMENT

During their manufacture, products conforming to the definition of the standard shall be heated throughout to a temperature of 70 °C for 30 seconds, or any other equivalent time/temperature combination.

5. DESIGNATION AND COMPOSITION

5.1 Designation

5.1.1 When a variety name is used to describe Processed Cheese or Spreadable Processed Cheese, the cheese blend from which the product is made must contain at least 75% of the cheese variety mentioned. The remaining cheese must be of similar type.

5.1.2 Where more variety names are used to describe a product, only those varieties may be used in the manufacture of the product.

[1] Endorsement postponed.

5.1.3 In this connection, it should be noted that Gruyere and Emmental are interchangeable.

5.2 Composition of a named variety process(ed) cheese

5.2.1 The minimum milkfat content in the dry matter shall be not less than that prescribed for the variety mentioned in the international individual standard for the natural cheese and in the case where two or more varieties are mentioned not less than the arithmetic average of the fat contents in dry matter prescribed in the standards concerned.

5.2.2 The minimum dry matter content shall not be more than 4% lower than the minimum dry matter content prescribed in the international standard for the variety and in the case of two or more varieties shall not be more than 4% lower than the arithmetical average. Process(ed) Gruyere or Emmental cheese will be exempt from this requirement; in these cases the minimum dry matter content shall be 50%.

5.2.3 In the case of varieties for which no international standards exist the minimum dry matter content will be related to the fat in dry matter content as prescribed in the table below:

Milk fat in dry matter %	Minimum dry matter %
65	53
60	52
55	51
50	50
45	48
40	46
35	44
30	42
25	40
20	38
15	37
10	36
less than 10	34

If national legislation of the consuming country differs from the above, the national legislation prevails in the case of varieties for which no international standards exist.

5.3 Composition of a named variety spreadable process(ed) cheese

5.3.1 The minimum milk fat content in the dry matter shall not be less than that prescribed for the variety in the international individual standard for the natural cheese.

5.3.2 The minimum dry matter content related to the declared minimum milkfat in dry matter content shall be in accordance with the following table:

Milk fat in dry matter %	Minimum dry matter %
65	45
60	44
55	44
50	43
45	41
40	39
35	36
30	33
25	31
20	29
15	29
10	29
less than 10	29

If national legislation of the consuming country differs from the above, the national legislation prevails in the case of varieties for which no international standards exist.

6. LABELLING

In addition to Sections 1, 2 , 4 and 6 of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1–1981), the following specific provisions apply:

6.1 The name of the food[1]

6.1.1 The name of a product in accordance with 5.1 shall be "Process(ed) _____ Cheese" or "Process(ed) Cheese" or "Spreadable Process(ed) _____ Cheese" or " Spreadable Process(ed) Cheese" (the blank being filled with the name of the variety of cheese used).

6.1.2 The name of a product in accordance with 5.1 shall be "Process(ed) _____ and _____ Cheese" or "and _____Process(ed) Cheese" or "Spreadable Process(ed) _____ and _____Cheese" or" _____ and _____ Spreadable Process(ed) Cheese", in descending order of proportion (the blank being filled with the name of the variety of cheese used).

6.1.3 In case the named variety process(ed) cheese or the named variety spreadable process(ed) cheese includes spices according to 2.4 or natural foodstuffs, according to 2.5 , the name of the product shall be the one applicable according to 6.1.1 and 6.1.2

[1] In some French and Spanish speaking countries the word "fromage" or "queso" (cheese) need not be included in the name of the product when a variety name is used to describe Process(ed) Cheese or Spreadable Process(ed) Cheese.

followed by the term "with _____", the blank being filled in with the common or usual name or names of the spices or natural foodstuffs used, in order of predominance by weight.

6.1.4 The milk fat content shall be declared as fat in the dry matter in multiples of 5% (the figures used being that of the 5% multiple immediately below the actual composition) and/or as percentage by mass. Process(ed) cheese or spreadable process(ed) cheese which carries the name of a single variety of cheese covered by an international individual natural cheese standard is exempt from the declaration of the fat content.

6.2 List of ingredients

A complete list of ingredients shall be declared on the label in descending order of proportion, in accordance with paragraph 3.2(c) of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1-1981).

6.3 Net contents

The net contents, except on individual portions not intended for separate sale, shall be declared by weight in either the metric system ("Système international" units) or avoirdupois or both systems of measurement as required by the country in which the food is sold.

6.4 Name and address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared, except on individual portions not intended for separate sale, in which case the declaration may be replaced by a trademark or other indication of the manufacturer, or importer, or seller.

6.5 Country of manufacture

The name of producing country shall be declared (for export only).

6.6 Date marking

There shall be a clear indication of the minimum durability date.

6.7 Lot identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot.

7. METHODS OF SAMPLING AND ANALYSIS

See relevant Codex texts on methods of analysis and sampling.

CODEX GENERAL STANDARD FOR PROCESS(ED) CHEESE AND SPREADABLE PROCESS(ED) CHEESE

CODEX STAN A-8(b)-1978

1. DEFINITION

Process(ed) cheese and spreadable process(ed) cheese are made by grinding, mixing, melting and emulsifying with the aid of heat and emulsifying agents one or more varieties of cheese, with or without the addition of milk components and/or other foodstuffs in accordance with paragraph 2.

2. OPTIONAL INGREDIENTS

2.1 Cream, butter and butteroil.

2.2 Milk products other than those listed under 2.1, max. 5% lactose content in the final product.

2.3 Salt (sodium chloride).

2.4 Vinegar.

2.5 Spices and other vegetable seasonings in sufficient quantity to characterize the product.

2.6 For the purpose of flavouring the product, foods other than sugars, properly cooked or otherwise prepared, may be added in sufficient quantity to characterize the product provided these additions, calculated on the basis of dry matter, do not exceed one sixth of the weight of the total solids of the final product.

2.7 Cultures of harmless bacteria and enzymes.

3. FOOD ADDITIVES

	Maximum level in the final product
Emulsifiers	
Sodium, potassium and calcium salts of the mono-, di- and polyphosphoric acids	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus
Sodium, potassium and calcium salts of citric acid	
Citric acid and/or phosphoric acid with sodium hydrogen carbonate and/or calcium carbonate	
Acidifiers/pH controlling agents	
Citric acid	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus
Phosphoric acid	
Acetic acid	
Lactic acid	
Sodium hydrogen carbonate and/or calcium carbonate	
Colours	
Annatto[1]	600 mg/kg singly or in combination
Beta-carotene	
Chlorophyll including copper chlorophyll	Limited by GMP
Riboflavin	
Oleoresin of paprika	
Curcumin	
Preservatives	
Either sorbic acid and its sodium and potassium salts, or propionic acid and its sodium and calcium salts	3 g/kg singly or in combination expressed as the acids
Nisin	12.5 mg of pure nisin per kg

4. HEAT TREATMENT

During their manufacture, products conforming to the definition of the standard shall be heated throughout to a temperature of 70 °C for 30 seconds, or any other equivalent or greater time/temperature combination.

5. DESIGNATION AND COMPOSITION

5.1 Designation

Products conforming to this standard may not be designated by a cheese variety name in connection with the name "Process(ed) Cheese" or "Spreadable Process(ed) Cheese"; but mention may be made on the label of the name of a cheese variety which gives a characteristic flavour to the product (e.g. "process(ed) cheese with _____").

[1] Endorsement postponed.

5.2 Composition

Process(ed) Cheese and Spreadable Process(ed) Cheese shall have a minimum dry matter content related to the declared minimum milk fat in dry matter content, as follows:

Milk fat In dry matter %	Minimum dry matter %	
	Process(ed) cheese	Spreadable process(ed) cheese
65	53	45
60	52	44
55	51	44
50	50	43
45	48	41
40	46	39
35	44	36
30	42	33
25	40	31
20	38	29
15	37	29
10	36	29
less than 10	34	29

6. LABELLING

In addition to Sections 1, 2 , 4 and 6 of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1-1981), the following specific provisions apply:

6.1 The name of the product

6.1.1 The name of the product shall be Process(ed) Cheese or Spreadable Process(ed) Cheese as applicable.

6.1.2 In case the Process(ed) Cheese or Spreadable Process(ed) Cheese above includes spices according to 2.5 or natural foodstuffs, according to 2.6 the name of the product shall be the one applicable above followed by the term "with _____", the blank being filled in with the common or usual names of the spices or natural foodstuffs used, in order of predominance by weight.

6.1.3 The milk fat content shall be declared as fat in the dry matter in multiples of 5% (the figure used being that of the 5% multiple immediately below the actual composition) and/or as percentage by mass.

6.2 List of ingredients

A complete list of ingredients shall be declared on the label in descending order of proportion, in accordance with paragraph 3.2(c) of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1-1981).

6.3 Net contents

The net contents, except on individual portions not intended for separate sale, shall be declared by weight in either the metric system ("Système international" units) or avoirdupois or both systems of measurement as required by the country in which the food is sold.

6.4 Name and address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared, except on individual portions not intended for separate sale, in which case the declaration may be replaced by a trademark or other indication of the manufacturer, or importer, or seller.

6.5 Country of manufacture

The name of the producing country shall be declared (for export only).

6.6 Date marking

There shall be a clear indication of the minimum durability date.

6.7 Lot identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot.

7. METHODS OF SAMPLING AND ANALYSIS

See relevant Codex texts on methods of analysis and sampling.

CODEX GENERAL STANDARD FOR PROCESS(ED) CHEESE PREPARATIONS (PROCESS(ED) CHEESE FOOD AND PROCESS(ED) CHEESE SPREAD)

CODEX STAN A-8(c)-1978

1. DEFINITION

Process(ed) cheese food or process(ed) cheese spread are made by grinding, mixing, melting and emulsifying with the aid of heat and emulsifying agents one or more varieties of cheese with any selection of ingredients or additives mentioned in paragraphs 2 and 3 below.

2. OPTIONAL INGREDIENTS

2.1 Cream, butter and butteroil and other dairy products.

2.2 Salt (sodium chloride).

2.3 Vinegar.

2.4 Spices and other vegetable seasonings in sufficient quantity to characterize the product.

2.5 For the purpose of flavouring the product, foods properly cooked or otherwise prepared, may be added in sufficient quantity to characterize the product provided these additions, calculated on the basis of dry matter, do not exceed one sixth of the weight of the total solids of the final product.

2.6 Sugars (any carbohydrate sweetening matter).

2.7 Cultures of harmless bacteria and enzymes.

3. FOOD ADDITIVES

	Maximum level in the final product
Emulsifiers	
Sodium, potassium and calcium salts of the mono-, di- and polyphosphoric acids Sodium, potassium and calcium salts of citric acid Citric acid and/or phosphoric acid with sodium hydrogen carbonate and/or calcium carbonate	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus

	Maximum level in the final product
Acidifiers/pH controlling agents	
Citric acid	40 g/kg, singly or in combination, calculated as anhydrous substances, except that added phosphorus compounds should not exceed 9 g/kg calculated as phosphorus
Phosphoric acid	
Acetic acid	
Lactic acid	
Sodium hydrogen carbonate and/or calcium carbonate	
Colours	
Annatto[1]	600 mg/kg singly or in combination
Beta-carotene	
Chlorophyll including copper chlorophyll	Limited by GMP
Riboflavin	
Oleoresin of paprika	
Curcumin	
Preservatives	
Either sorbic acid and its sodium and potassium salts, or propionic acid and its sodium and calcium salts	3 g/kg singly or in combination expressed as the acids
Nisin	12.5 mg of pure nisin per kg
Taste intensifiers	
Sodium glutamate	Limited by GMP
Other additives	
Arabic gum	8 g/kg singly or in combination
Locust (carob) bean gum	
Karaya gum[1]	
Guar gum	
Agar-agar	
Carrageenan	
Xanthan gum[1]	
Sodium carboxymethylcellulose (cellulose gum)	
Sodium, potassium, calcium and ammonium salts of alginic acid	
Propylene glycol ester of alginic acid	
Pectins	
Gelatine	

4. HEAT TREATMENT

During their manufacture, products conforming to the definition of the standard shall be heated throughout to a temperature of 70 °C for 30 seconds, or any other equivalent or greater time/temperature combination.

[1] Endorsement postponed.

5. DESIGNATION AND COMPOSITION

5.1 Designation

Products conforming to this standard may not be designated by a cheese variety name in connection with the name processed cheese preparation (process(ed) cheese food or cheese spread), but mention may be made of the name of a cheese variety on the label in close proximity to the label declarations required under paragraph 6.2.

5.2 Composition

Process(ed) cheese preparations (process(ed) cheese food and process(ed) cheese spread) shall have a minimum dry matter content related to the declared minimum milk fat in dry matter content, as follows:

Milk fat in dry matter %	Minimum dry matter %
65	45
60	44
55	44
50	43
45	41
40	39
35	36
30	33
25	31
20	29
15	29
10	29
less than 10	29

At least 51% of the dry matter of the final product shall be derived from cheese.

6. LABELLING

In addition to Sections 1, 2 , 4 and 6 of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1-1981), the following specific provisions apply:

6.1 The name of the product

6.1.1 The name of the product shall be "Process(ed) Cheese Preparation" or where national regulations distinguish between "process(ed) cheese food" and "process(ed) cheese spread", these names will apply.

6.1.2 In case the product includes spices and natural foodstuffs as provided for under 2.4 and 2.5, the name of the product shall be the one applicable above followed by the term "with ____" the blank being filled in with the common or usual name or names of the spices or natural foodstuffs used, in order of predominance by weight.

6.1.3 The milk fat content shall be declared as fat in the dry matter in multiples of 5% (the figure used to be that of the 5% multiple immediately below the actual composition) and/or as percentage by mass.

6.2 List of ingredients

A complete list of ingredients shall be declared on the label in descending order of proportion, in accordance with paragraph 3.2(c) of the *Codex General Standard for the Labelling of Prepackaged Foods* (Ref. No. CODEX STAN 1-1981).

6.3 Net contents

The net contents, except on individual portions not intended for separate sale, shall be declared by weight in either the metric system (Système international units) or avoirdupois or both systems of measurement as required by the country in which the food is sold.

6.4 Name and address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared, except on individual portions not intended for separate sale, in which case the declaration may be replaced by a trademark or other indication of the manufacturer, or importer, or seller.

6.5 Country of manufacture

The name of the producing country shall be declared (for export only).

6.6 Date marking

There shall be a clear indication of the minimum durability date.

6.7 Lot identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot.

7. METHODS OF SAMPLING AND ANALYSIS

See relevant Codex texts on methods of analysis and sampling.

CODEX GROUP STANDARD FOR CHEESES IN BRINE

CODEX STAN 208-1999, Amend. 2001

1. SCOPE

This Standard applies to Cheeses in Brine, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard. Subject to the provisions of this Group Standard, Codex standards for individual varieties of Cheeses in Brine may contain provisions which are more specific than those in this Standard.

2. DESCRIPTION

Cheeses in Brine are semi-hard to soft ripened cheeses in conformity with Standard A-6. The body has a white to yellowish colour and a compact texture suitable for slicing, with none to few mechanical openings. The cheeses have no actual rind and have been ripened and preserved in brine until delivered to, or prepacked for, the consumer. Certain individual Cheeses in Brine contain specific herbs and spices as part of their identity.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/or flavour producing bacteria and cultures of other harmless micro-organisms;
- Safe and suitable enzymes;
- Sodium chloride;
- Potable water;
- Herbs and spices where part of the identity of the Cheese in Brine.

3.3 Composition

	Soft	Semi-hard
Minimum fat in dry matter, %	40	40
Minimum dry matter, %	40	52

4. FOOD ADDITIVES

Only those food additives listed may be used and only within the limits specified.

INS no.	Name of additive	Maximum level
Acidity regulators		
270	Lactic acid (L-, D- and DL-)	Limited by GMP
575	Glucono delta-lactone (GDL)	Limited by GMP

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply.

7.1 Name of the food

The name of the food shall be Cheese in Brine. However, the word "Cheese in Brine" may be omitted in the designation of an individual Cheese in Brine variety reserved by a Codex standard for individual Cheese in Brine, and, in the absence thereof, a variety name specified in the national legislation of the country in which the product is sold, provided that the omission does not create an erroneous impression regarding the character of the food.

7.2 Declaration of milkfat content

The milkfat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label provided that the number of servings is stated.

Additionally, the following terms may be used:

High fat	(if the content of FDM is above or equal to 60%);
Full fat	(if the content of FDM is above or equal to 45% and less than 60%)
Medium fat	(if the content of FDM is above or equal to 25% and less than 45%)
Partially skimmed	(if the content of FDM is above or equal to 10% and less than 25%)
Skim	(if the content of FDM is less than 10%)

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

8.1 Sampling

According to IDF Standard 50C:1995/ISO 707:1997/AOAC 933.12.

Special requirements for Cheese in Brine: A representative piece of cheese is placed on a cloth or on a sheet of absorbent paper for 5 to 10 min. A slice of 2–3 cm is cut off and sent to the laboratory in a sealed insulated box for analysis.

CODEX GROUP STANDARD FOR UNRIPENED CHEESE INCLUDING FRESH CHEESE

CODEX STAN 221-2001

1. SCOPE

This Standard applies to unripened cheese including fresh cheese, intended for direct consumption or further processing, in conformity with the description in Section 2 of this Standard. Subject to the provisions of this Standard, Codex Standards for individual varieties of unripened cheese may contain provisions, which are more specific than those in this Standard and in these cases; those specific provisions shall apply.

2. DESCRIPTION

Unripened cheeses including fresh cheeses are products in conformity with the *Codex General Standard for Cheese*, which are ready for consumption shortly after manufacture.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride;
- Potable water;
- Gelatine and starches: Notwithstanding the provisions in the *Codex Standard for Cheese* (A-6), these substances can be used in the same function as stabilizers, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice taking into account any use of the stabilisers/ thickeners listed in section 4;
- Vinegar;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *Codex Standard for Cheese* (A-6), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice taking into account any use of the anti-caking agents listed in section 4.

4. FOOD ADDITIVES

Only those food additives listed below may be used and only within the limits specified. Additives not listed below but provided for in individual Codex standards for varieties of Unripened Cheeses may also be used in similar types of cheese within the limits specified within those standards.

INS no.	Name of additive	Maximum level
Acids		
260	Acetic acid, glacial	Limited by GMP
270	Lactic acid (L-, D- and DL-)	Limited by GMP
296	Malic acid (DL-)	Limited by GMP
330	Citric acid	Limited by GMP
338	Orthophosphoric acid	2 g/kg, expressed as P_2O_5
507	Hydrochloric acid	Limited by GMP
Acidity regulators		
170	Calcium carbonates	Limited by GMP
500	Sodium carbonates	Limited by GMP
501	Potassium carbonates	Limited by GMP
575	Glucono delta-lactone (GDL)	Limited by GMP
Stabilizers/thickeners		
Stabilizers and thickeners including modified starches may be used in compliance with the definition for milk products and only to the extent they are functionally necessary taking into account any use of gelatine and starch as provided for in section 3.2.		
331	Sodium citrates	Limited by GMP
332	Potassium citrates	
333	Calcium citrates	
339	Sodium phosphates	3.5 g/kg, singly or in combination, expressed as P_2O_5
340	Potassium phosphates	
341	Calcium phosphates	
450(i)	Disodium diphosphate	
450(ii)	Trisodium diphosphate	
541	Sodium aluminium phosphate	
400	Alginic acid	Limited by GMP
401	Sodium alginate	
402	Potassium alginate	
403	Ammonium alginate	
404	Calcium alginate	
405	Propylene glycol alginate	5 g/kg
406	Agar	Limited by GMP
407	Carrageenan and its Na, K, NH_4 salts (includes Furcelleran)	
410	Carob bean gum	
412	Guar gum	
413	Tragacanth gum	
415	Xanthan gum	
416	Karaya gum	

INS no.	Name of additive	Maximum level
417	Tara gum	Limited by GMP
440	Pectins	
460	Cellulose	
466	Sodium carboxymethyl cellulose	
576	Sodium gluconate	
Modified starches as follows:		
1400	Dextrins, roasted starch white and yellow	Limited by GMP
1401	Acid-treated starch	
1402	Alkaline treated starch	
1403	Bleached starched	
1404	Oxidized starch	
1405	Starches, enzyme-treated	
1410	Monostarch phosphate	
1412	Distarch phosphate esterified with sodium trimetasphosphate; esterified with phosphorus oxychloride	
1413	Phosphated distarch phosphate	
1414	Acetylated distarch phosphate	
1420	Starch acetate esterified with acetic anhydride	
1421	Starch acetate esterified with vinyl acetate	
1422	Acetylated distarch adipate	
1440	Hydroxypropyl starch	
1442	Hydroxypropyl distarch phosphate	
Colours		
100	Curcumins (for edible cheese rind)	Limited by GMP
101	Riboflavins	Limited by GMP
140	Chlorophyll	Limited by GMP
141	Copper chlorophylls	15 mg/kg, singly or combined
160a(i)	β-Carotene (synthetic)	25 mg/kg
160a(ii)	Carotenes (natural extracts)	600 mg/kg
160b	Annatto extracts	
	normal coloured	10 mg/kg (on bixin/norbixin basis)
	orange coloured	25 mg/kg (on bixin/norbixin basis)
	deep orange coloured	50 mg/kg (on bixin/norbixin basis)
160c	Paprika oleoresins	Limited by GMP
160e	β-apo-Carotenal	35 mg/kg
160f	β-apo-8´-Carotenoic acid, methyl or ethyl ester	35 mg/kg
162	Beet red	Limited by GMP
171	Titanium dioxide	Limited by GMP
Preservatives		
200	Sorbic acid	1 g/kg of cheese, singly or in combination, expressed as sorbic acid
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg

INS no.	Name of additive	Maximum level
280	Propionic acid	Limited by GMP
281	Sodium propionate	
282	Calcium propionate	
283	Potassium propionate	
For surface/rind treatment only:		
235	Pimaricin (natamycin)[1]	2 mg/dm^2 of surface. Not present in a depth of 5 mm.
Foaming agents (for whipped products only)		
290	Carbon dioxide	Limited by GMP
941	Nitrogen	Limited by GMP
Sliced, cut, shredded and grated products only (surface treatment)		
Anticaking agents		
460	Cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 g/kg singly or in combination. Silicates calculated as silicon dioxide
552	Calcium silicate	
553	Magnesium silicates	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	
560	Potassium silicate	
Preservatives		
200	Sorbic acid	1 g/kg of cheese, singly or in combination, expressed as sorbic acid
202	Potassium sorbate	
203	Calcium sorbate	
280	Propionic acid	Limited by GMP
281	Sodium propionate	
282	Calcium propionate	
283	Potassium propionate	
235	Pimaricin (natamycin)[1]	20 mg/kg applied to the surface added during kneading and stretching process

5. CONTAMINANTS

5.1 Heavy metals

The products covered by this Standard shall comply with the maximum limits established by the Codex Alimentarius Commission.

5.2 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius Commission.

[1] Temporarily endorsed by 24th CAC (ALINORM 01/41, para. 107).

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name of the food shall be unripened cheese. However, the words "unripened cheese" may be omitted in the designation of an individual unripened cheese variety reserved by a Codex standard for individual cheeses, and, in the absence thereof, a variety name specified in the national legislation of the country in which the product is sold, provided that the omission does not create an erroneous impression regarding the character of the food.

In case the product is not designated by an alternative or a variety name, but with the designation "unripened cheese", the designation may be accompanied by a descriptive term such as provided for in Section 7.1.1 of the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Unripened cheese may alternatively be designated "fresh cheese" provided it is not misleading to the consumer in the country in which the product is sold.

7.2 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of sale to the final consumer, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

Additionally, the following terms may be used:

High fat	(if the content of FDM is above or equal to 60%)
Full fat	(if the content of FDM is above or equal to 45% and less than 60%)
Medium fat	(if the content of FDM is above or equal to 25% and less than 45%)
Partially skimmed	(if the content of FDM is above or equal to 10% and less than 25%)
Skim	(if the content of FDM is less than 10%)

7.3 Labelling of non-retail containers

Information required in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container, and, in the absence of such a container on the cheese itself. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

CODEX STANDARD FOR MOZZARELLA

CODEX STAN 262-2007

1. SCOPE

This Standard applies to Mozzarella intended for direct consumption or for further processing, in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Mozzarella is an unripened cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978) and the *Standard for Unripened Cheese Including Fresh Cheese* (CODEX STAN 221-2001). It is a smooth elastic cheese with a long stranded parallel-orientated fibrous protein structure without evidence of curd granules. The cheese is rindless [1] and may be formed into various shapes.

Mozzarella with a high moisture content is a soft cheese with overlying layers that may form pockets containing liquid of milky appearance. It may be packed with or without the liquid. The cheese has a near white colour.

Mozzarella with a low moisture content is a firm/semi-hard homogeneous cheese without holes and is suitable for shredding.

Mozzarella is made by "pasta filata" processing, which consists of heating curd of a suitable pH value kneading and stretching until the curd is smooth and free from lumps. Still warm, the curd is cut and moulded, then firmed by cooling. Other processing techniques, which give end products with the same physical, chemical and organoleptic characteristics are allowed.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Safe and suitable processing aids;
- Vinegar;

[1] The cheese has been kept in such a way that no rind is developed (a "rindless" cheese).

– Potable water;
– Rice, corn and potato flours and starches: Notwithstanding the provisions in the General Standard for Cheese (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded Mozzarella with a low moisture content only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:			
■ with high moisture:	20%	Not restricted	40% to 50%
■ with low moisture	18%	Not restricted	40% to 50%

Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m)*:	**Corresponding minimum dry matter content** *(m/m)*:	
		With low moisture	With high moisture
	Equal to or above 18% but less than 30%:	34%	–
	Equal to or above 20% but less than 30%:	–	24%
	Equal to or above 30% but less than 40%:	39%	26%
	Equal to or above 40% but less than 45%:	42%	29%
	Equal to or above 45% but less than 50%:	45%	31%
	Equal to or above 50% but less than 60%:	47%	34%
	Equal to or above 60% but less than 85%:	53%	38%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	JUSTIFIED USE			
	Mozzarella with low moisture content		Mozzarella with high moisture content	
	Cheese mass	Surface treatment	Cheese mass	Surface treatment
Colours:	X[1]	–	X[1]	–
Bleaching agents:	–	–	–	–
Acids:	X	–	X	–
Acidity regulators:	X	–	X	–
Stabilizers:	X	–	X	–
Thickeners:	X	–	X	–
Emulsifiers:	–	–	–	–
Antioxidants:	–	–	–	–
Preservatives:	X	X	X	
Foaming agents:	–	–	–	–
Anti–caking agents:	–	X[2]	–	

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Preservatives		
200	Sorbic acid	1 000 mg/kg singly or in combination as sorbic acid
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	Not exceeding 2 mg/dm^2 and not present in a depth of 5 mm
280	Propionic acid	Limited by GMP
281	Sodium propionate	
282	Calcium propionate	
283	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
261(i)	Potassium acetate	Limited by GMP
261(ii)	Potassium diacetate	Limited by GMP
262(i)	Sodium acetate	Limited by GMP
263	Calcium acetate	Limited by GMP
325	Sodium lactate	Limited by GMP
326	Potassium lactate	Limited by GMP
327	Calcium lactate	Limited by GMP
350(i)	Sodium hydrogen malate	Limited by GMP
350(ii)	Sodium malate	Limited by GMP
351(i)	Potassium hydrogen malate	Limited by GMP
351(ii)	Potassium malate	Limited by GMP

INS no.	Name of additive	Maximum level
352(ii)	Calcium malate	Limited by GMP
500(i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonate	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
504(ii)	Magnesium hydrogen carbonate	Limited by GMP
575	Glucono-delta-lactone	Limited by GMP
577	Potassium gluconate	Limited by GMP
578	Calcium gluconate	Limited by GMP
Acids		
260	Acetic acid	Limited by GMP
270	Lactic acid (L-, D- and DL-)	Limited by GMP
296	Malic acid (DL-)	Limited by GMP
330	Citric acid	Limited by GMP
338	Orthophosphoric acid	880 mg/kg, as phosphorus
507	Hydrochloric acid	Limited by GMP
Stabilizers		
331(i)	Sodium dihydrogen citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
333	Calcium citrates	Limited by GMP
339(i)	Monosodium orthophosphate	4 400 mg/kg, singly or in combination, expressed as phosphorus
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
341(iii)	Tricalcium orthophosphate	
342(i)	Monoammonium orthophosphate	
342(ii)	Diammonium orthophosphate	
343(ii)	Dimagnesium orthophosphate	
343(iii)	Trimagnesium orthophosphate	
450(i)	Disodium diphosphate	
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iv)	Calcium polyphosphate	
452(v)	Ammonium polyphosphate	
406	Agar	Limited by GMP

INS no.	Name of additive	Maximum level
407	Carrageenan and its Na, K, NH_4, Ca and Mg salts (includes furcelleran)	Limited by GMP
407a	Processed Euchema seaweed (PES)	Limited by GMP
410	Carob bean gum	Limited by GMP
412	Guar gum	Limited by GMP
413	Tragacanth gum	Limited by GMP
415	Xanthan gum	Limited by GMP
416	Karaya gum	Limited by GMP
417	Tara gum	Limited by GMP
440	Pectins	Limited by GMP
466	Sodium carboxymethyl cellulose	Limited by GMP
Colours		
140	Chlorophyll	Limited by GMP
141(i)	Chlorophyll copper complexes	5 mg/kg singly or in combination
141(ii)	Chlorophyllin copper complex, sodium and potassium salts	
171	Titanium dioxide	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Mozzarella may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of Mozzarella with a high moisture content shall be accompanied by a qualifying term describing the true nature of the product.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 023-1997)[2].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 40% fat in dry matter constitutes the references.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Labelling of non retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.
Determination of equivalency between "pasta filata" processing and other processing techniques:
Identification of the typical structure by confocal laser scanning microscopy.

APPENDIX

Information on usual patterns of manufacturing Mozzarella

The information below is intended for voluntary application by commercial partners and not for application by governments.

Mozzarella with a high moisture content

1. **Method of manufacture**

1.1 The principal starter culture micro-organisms are *Streptococcus thermophilus* and/or *Lactococcus* spp.

1.2 Products made from buffalo's milk shall be salted in cold brine.

CODEX STANDARD FOR CHEDDAR

CODEX STAN 263-1966

1. SCOPE

This Standard applies to Cheddar intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Cheddar is a ripened hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or orange colour and a firm-textured (when pressed by thumb), smooth and waxy texture. Gas holes are absent, but a few openings and splits are acceptable. The cheese is manufactured and sold with or without[1] rind which may be coated.

For Cheddar ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 5 weeks at 7–15 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Cheddar intended for further processing need not exhibit the same extent of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless microorganisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-1-1966. Adopted in 1996. Revision 2007.

functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	22%	Not restricted	48% to 60%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 22% but less than 30%:	49%
Equal to or above 30% but less than 40%:	53%
Equal to or above 40% but less than 48%:	57%
Equal to or above 48% but less than 60%:	61%
Equal to or above 60%:	66%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class:	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti–caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X = The use of additives belonging to the class is technologically justified.
– = The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
101(i)	Riboflavin	300 mg/kg
140	Chlorophyll	Limited by GMP
160a(i)	beta-Carotene (synthetic)	35 mg/kg Singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	beta-Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only *
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only *
251	Sodium nitrate	37 mg/kg Singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only *
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504 (i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg Singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (Codex STAN A-6-1978)

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Cheddar may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass, which ever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.2 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2]

[2] For the purpose of comparative nutritional claims, the minimum fat content of 48% fat in dry matter constitutes the reference.

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

APPENDIX

Information on usual patterns of manufacturing Cheddar

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Method of manufacture

1.1 Starter cultures consist of non-gas forming lactic acid producing bacteria.

1.2 After coagulation, the curd is cut and heated in its whey to a temperature above the coagulation temperature. The curd is separated from the whey and stirred or cheddared. In traditional manufacture the curd is cut into blocks which are turned and progressively piled, keeping the curd warm, which results in the curd becoming compressed, smooth and elastic. After cheddaring the curd is milled. When the desired acidity is reached the curd is salted. The curd and salt are then mixed and moulded. Other processing techniques, which give end products with the same physical, chemical and organoleptic characteristics may be applied.

CODEX STANDARD FOR DANBO

CODEX STAN 264-1966

1. SCOPE

This Standard applies to Danbo intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Danbo is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) texture, suitable for cutting, with few to plentiful, evenly distributed, smooth and round pea sized (or mostly up to 10 mm in diameter) gas holes, but a few openings and splits are acceptable. The shape is flat squared or parallelepiped. The cheese is manufactured and sold with or without[1] hard or slightly moist smear ripened rind, which may be coated.

For Danbo ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 3 weeks at 12–20 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Danbo intended for further processing need not exhibit the same extent of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese, see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-3-1966. Adopted jn 1966. Revision 2007.

used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	20%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 20% but less than 30%:	41%
Equal to or above 30% but less than 40%:	44%
Equal to or above 40% but less than 45%:	50%
Equal to or above 45 but less than 55%:	52%
Equal to or above 55%:	57%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class:	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
101(i)	Riboflavin	300 mg/kg
140	Chlorophyll	Limited by GMP
160a(i)	beta-carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-carotene (*Blakeslea triaspora*)	
160e	beta-apo-8'Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only *
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only *
251	Sodium nitrate	37 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only *
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504 (i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium cilicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (Codex STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Danbo may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.2 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

[2] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR EDAM

CODEX STAN 265-1966

1. SCOPE

This Standard applies to Edam intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Edam is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) texture, suitable for cutting, with few more or less round rice to pea sized (or mostly up to 10 mm in diameter) gas holes, distributed in a reasonable regular manner throughout the interior of the cheese, but few openings and splits are acceptable. The shape is spherical, of a flat block or of a loaf. The cheese is manufactured and sold with dry rind, which may be coated. Edam of flat block or loaf shape is also sold without rind[1].

For Edam ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 3 weeks at 10–18 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Edam intended for further processing need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be

[1] This is not to mean that the rind has been removed before sale, instead the the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese, see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-4-1966. Adopted 1966. Revision 2007

used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	40% to 50%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 30% but less than 40%:	47%
Equal to or above 40% but less than 45%:	51%
Equal to or above 45% but less than 50%:	55%
Equal to or above 50% but less than 60%:	57%
Equal to or above 60%:	62%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg Singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The names Edam, Edamer or Edammer may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimumspecified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.2 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation

[2] For the purpose of comparative nutritional claims, the minimum fat content of 40% fat in dry matter constitutes the reference.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale., either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Edam

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Appearance characteristics

Edam, in the spherical form, is normally manufactured with a weights ranging from 1.5 to 2.5 kg.

2. Method of manufacture

Salting method: Salted in brine.

CODEX STANDARD FOR GOUDA

CODEX STAN 266-1966

1. SCOPE

This Standard applies to Gouda intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Gouda is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) texture, suitable for cutting, with few to plentiful, more or less round pin's head to pea sized (or mostly up to 10 mm in diameter) gas holes, distributed in a reasonable regular manner throughout the interior of the cheese, but few openings and splits are acceptable. The shape is of a flattened cylinder with convex sides, a flat block, or a loaf. The cheese is manufactured and sold with a dry rind, which may be coated. Gouda of flat block or loaf shape is also sold without[1] rind.

For Gouda ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 3 weeks at 10–17 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Gouda intended for further processing and Gouda of low weights (< 2.5 kg) need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride;and potassium chloride as a salt substitute;

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese, see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-5-1966. Adopted 2001. Revision 2007.

- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	48% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 30% but less than 40%:	48%
Equal to or above 40% but less than 48%:	52%
Equal to or above 48% but less than 60%:	55%
Equal to or above 60%:	62%

Gouda with between 40 and 48% FDM and with a weight of less than 2.5 kg can be sold with a DM content of min. 50%, provided that the name is qualified by the term "baby".

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP

INS no.	Name of additive	Maximum level
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Gouda may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this

standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale , either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 48% fat in dry matter constitutes the reference.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Gouda

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Appearance characteristics

Gouda is normally manufactured with weights ranging from 2.5 to 30 kg. Lower weights are normally qualified by the term "Baby".

2. Method of manufacture

Salting method: Salted in brine.

CODEX STANDARD FOR HAVARTI

CODEX STAN 267-1966

1. SCOPE

This Standard applies to Havarti intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Havarti is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a texture suitable for cutting, with plentiful, irregular and coarse large rice seed sized (or mostly 1–2 mm in width and up to 10 mm in length) gas holes. The shape is flat cylindrical, rectangular or of a loaf shape. The cheese is sold with or without[1] a slightly greasy smear ripened rind, which may be coated.

For Havarti ready for consumption, the ripening procedure to develop flavour and body characteristics is normally, depending on weight, 1–2 weeks at 14–18 °C (for smear development) followed by from 1–3 weeks at 8–12 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Havarti intended for further processing need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

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used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 30% but less than 40%:	46%
Equal to or above 40% but less than 45%:	48%
Equal to or above 45% but less than 55%:	50%
Equal to or above 55% but less than 60%:	54%
Equal to or above 60%:	58%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-Carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	Beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium cilicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (Codex STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Havarti may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

Havarti with a fat in dry matter content of minimum 60% may alternatively be designated Cream Havarti.

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR SAMSØ

CODEX STAN 268-1966

1. SCOPE

This Standard applies to Samsø intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Samsø is a ripened hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6- 1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) texture suitable for cutting, with few to plentiful, evenly distributed, smooth and round pea to cherry sized (or mostly up to 20 mm in diameter) gas holes, but few openings and splits are acceptable. The shape is a flat cylindrical, flat square or rectangular. The cheese is sold with or without[1] a hard, dry rind, which may be coated.

For Samsø ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 3 weeks at 8–17 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Samsø intended for further processing need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese**.** For rindless cheese see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-7-1966. Adopted in 1966. Revision 2007.

used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content** *(m/m):*
Equal to or above 30% but less than 40%:	46%
Equal to or above 40% but less than 45%:	52%
Equal to or above 45% but less than 55%:	54%
Equal to or above 55%:	59%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-Carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (Codex STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57- 2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Samsø may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR EMMENTAL

CODEX STAN 269-1967

1. SCOPE

This Standard applies to Emmental intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Emmental is a ripened hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a ivory through to light yellow or yellow colour and an elastic, sliceable but not sticky texture, with regular, scarce to plentiful distributed, mat to brilliant, cherry to walnut sized (or mostly from 1 to 5 cm in diameter) gas holes, but few openings and splits are acceptable. Emmental is typically manufactured as wheels and blocks of weights from 40 kg or more but individual countries may on their territory permit other weights provided that the cheese exhibit similar physical, biochemical and sensory properties. The cheese is manufactured and sold with or without [1] a hard, dry rind. The typical flavour is mild, nut-like and sweet, more or less pronounced.

For Emmental ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 2 months at 10–25°C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided a minimum period of 6 weeks is observed and provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Emmental intended for further processing need not exhibit the same degree of ripening, when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and Potassium Chloride as a salt substitute;

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese see also the Appendix to the Codex General Standard for Cheese (CODEX STAN A-6-1978).

Formely CODEX STAN C-9-1967 – Standard for Emmentaler.
Adopted 1967. Revision 2007.

- Safe and suitable processing aids;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference leve *(m/m)*
Milkfat in dry matter:	45%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 45% but less than 50%:		60%
	Equal to or above 50% but less than 60%		62%
	Equal to or above 60%:		67%
Propionic acid in cheese ready for sale[1]:	minimum150 mg/100g		
Calcium content[1]:	minimum 800 mg/100g		

[1] The purpose of these criteria is to provide targets for the validation (initial assessment prior to the design of the manufacturing process), respectively, of (i) whether the intended fermentation and ripening conditions are capable of achieving the activity of propionic acid producing bacteria, and of (ii) whether the curd management and pH development are capable of obtaining the characteristic texture.

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

3.4 Essential manufacturing characteristics

Emmental is obtained by microbiological fermentation, using thermophilic lactic acid producing bacteria for the primary (lactose) fermentation; the secondary (lactate) fermentation is characterized by the activity of propionic acid producing bacteria. The curd is heated after cutting to a temperature significantly above[2] the coagulation temperature.

[2] The temperature required to obtain the compositional and sensory characteristics specified by this Standard depends on a number of other technology factors, including the suitability of the milk for Emmental manufacture, the choice and activity of coagulating enzymes and of primary and secondary starter cultures, the pH at whey drainage and at the point of whey removal, and the ripening/storage conditions. These other factors differ according to local circumstances: In many cases, in particular where traditional technology is applied, a cooking temperatures of approx. 50 °C is typically applied; In other cases, temperatures above and below are applied.

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl esters	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	

INS no.	Name of additive	Maximum level
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57–2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The names Emmental or Emmentaler may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the

product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is above the reference range specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997) [3].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation [4] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale. either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the

[3] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

[4] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Emmental

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Appearance characteristics

Usual dimensions:

Shape:	**Wheel**	**Block**
Height:	12–30 cm	12–30 cm
Diameter:	70–100 cm	–
Minimum weight:	60 kg	40 kg

2. Method of manufacture

2.1 Fermentation procedure: Microbiologically derived acid development.

CODEX STANDARD FOR TILSITER

CODEX STAN 270-1968

1. SCOPE

This Standard applies to Tilsiter intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Tilsiter is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) texture suitable for cutting, with irregularly shaped, shiny and evenly distributed gas holes. The cheese is manufactured and sold with or without[1] a well-dried smear-developed rind, which may be coated.

For Tilsiter ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 3 weeks at 10–16 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Tilsiter intended for further processing need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese, see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-11-1968. Adopted in 1968. Revision 2007.

cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 30% but less than 40%:		49%
	Equal to or above 40% but less than 45%:		53%
	Equal to or above 45% but less than 50%:		55%
	Equal to or above 50% but less than 60%:		57%
	Equal to or above 60% but less than 85%:		61%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti-caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-Carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8′-Carotenal	
160f	beta-apo-8′-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg Singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, (amorphous)	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (Codex STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Tilsiter may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997).[2]

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR SAINT-PAULIN

CODEX STAN 271-1968

1. SCOPE

This Standard applies to Saint-Paulin intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Saint-Paulin is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a firm-textured (when pressed by thumb) but flexible texture. Gas holes are generally absent, but few openings and splits are acceptable. The cheese is manufactured and sold with or without[1] a dry or slightly moist rind, which is hard, but elastic under thumb pressure, and which may be coated.

For Saint-Paulin ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 1 week at 10–17 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Saint-Paulin intended for further processing need not exhibit the same degree of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film may be used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese. For rindless cheese, see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-13-1968. Adopted in 1968. Revision 2007.

cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	40%	Not restricted	40% to 50%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 40% but less than 60%:		44%
	Equal to or above 60%:		54%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti–caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only*
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only*
251	Sodium nitrate	35 mg/kg singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only*
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 mg/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

* For the definition of cheese surface and rind see Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Codex Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Saint-Paulin may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is above the reference range specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].
The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 40% fat in dry matter constitutes the reference.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

APPENDIX

Information on usual patterns of manufacturing Saint-Paulin

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Appearance characteristics

1.1 Shape: Small flat cylinder with slightly convex sides. Other shapes are possible.

1.2 Dimensions and weights:

a) Usual variant: Diameter approx. 20 cm; min. weight 1.3 kg
b) "Petit Saint-Paulin": Diameter 8–13 cm; min. weight 150 g.
c) "Mini Saint-Paulin": Min. weight 20 g.

2. Method of manufacture

2.1 Fermentation procedure: Microbiologically derived acid development.

2.2 Other characteristics: The cheese is salted in brine.

3. Qualifiers

The designations "Petit Saint-Paulin" and "Mini Saint-Paulin" should be used when the cheese complies with the provisions for dimensions and weights (1.2).

CODEX STANDARD FOR PROVOLONE

CODEX STAN 272-1968

1. SCOPE

This Standard applies to Provolone intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Provolone is a ripened firm/semi-hard cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978). The body has a near white or ivory through to light yellow or yellow colour and a fibrous texture with long stranded parallel-orientated protein fibres. It is suitable for cutting and, when aged, for grating as well. Gas holes are generally absent, but few openings and splits are acceptable. The shape is mainly cylindrical or pear-shaped, but other shapes are possible. The cheese is manufactured and sold with or without [1] a rind, which may be coated.

For Provolone ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 1 month at 10–20 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Provolone intended for further processing and Provolone of low weights (< 2 kg) need not exhibit the same degree of ripening when justified through technical and/or trade needs.

Provolone is made by "pasta filata" processing which consists of heating curd of a suitable pH value, kneading and stretching until the curd is smooth and free from lumps. Still warm, the curd is cut and moulded, then firmed by cooling in chilled water or brine. Other processing techniques, which give end products with the same physical, chemical and organoleptic characteristics are allowed.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;

[1] This is not to mean that the rind has been removed before sale, instead the cheese has been ripened and/or kept in such a way that no rind is developed (a "rindless" cheese). Ripening film is used in the manufacture of rindless cheese. Ripening film may also constitute the coating that protects the cheese**.** For rindless cheese see also the Appendix to the *Codex General Standard for Cheese* (CODEX STAN A-6-1978).

Formerly CODEX STAN C-15-1968. Adopted in 1968. Revision 2007.

- Sodium chloride and Potassium chloride as salt substitute;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;
- Potable water;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	45%	Not restricted	45% to 50%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		

Fat in dry matter content *(m/m):*	**Corresponding minimum dry matter content (***m/m***):**
Equal to or above 45% but less than 50%:	51%
Equal to or above 50% but less than 60%:	53%
Equal to or above 60%:	60%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

3.4 Essential manufacturing characteristics

The principal starter culture micro-organisms shall be *Lactobacillus helveticus*, *Streptococcus salivarius* subsp. *thermophilus*, *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Lactobacillus casei*.

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class:	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	X
Foaming agents:	–	–
Anti–caking agents:	–	X[2]

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] For the surface of sliced, cut, shredded or grated cheese, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'Carotenoic acid, methyl or ethyl ester	
160a(ii)	Carotenes, vegetable	600 mg/kg
171	Titanium dioxide	Limited by GMP
Preservatives		
1105	Lysozyme	Limited by GMP
200	Sorbic acid	1 000 mg/kg based on sorbic acid. Surface Treatment only *
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
235	Pimaricin (Natamycin)	2 mg/dm^2 Not present at a depth of 5 mm. Surface Treatment only *
239	Hexamethylene tetramine	25 mg/kg Expressed as formaldehyde
251	Sodium nitrate	35 mg/kg Singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3 000 mg/kg Surface Treatment only *
281	Sodium propionate	
282	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP

INS no.	Name of additive	Maximum level
Anticaking agents		
460(i)	Microcrystalline cellulose	Limited by GMP
460(ii)	Powdered cellulose	Limited by GMP
551	Silicon dioxide, amorphous	10 000 g/kg singly or in combination Silicates calculated as silicon dioxide
552	Calcium silicate	
553(i)	Magnesium silicate	
553(iii)	Talc	
554	Sodium aluminosilicate	
556	Calcium aluminium silicate	
559	Aluminium silicate	

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Provolone may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is above the reference range specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997).[2]

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Date marking

Notwithstanding the provisions of Section 4.7.1 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the date of manufacture may be declared instead of the minimum durability information, provided that the product is not intended to be purchased as such by the final consumer.

7.5 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

[2] For the purpose of comparative nutritional claims, the average minimum fat content of 45% fat in dry matter constitutes the reference.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Provolone

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Appearance characteristics

1.1 Typical shapes: Cylindrical (Salame), pear-shaped (Mandarino), pear-shaped cylinder (Gigantino) and flask (Fiaschetta).

1.2 Typical packing: The cheese is typically encased in ropes.

CODEX STANDARD FOR COTTAGE CHEESE

CODEX STAN 273-1968

1. SCOPE

This Standard applies to Cottage Cheese intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Cottage Cheese is a soft, rindless[1], unripened cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978) and the *Standard for Unripened Cheese Including Fresh Cheese* (CODEX STAN 221-2001). The body has a near white colour and a granular texture consisting of discrete individual soft curd granules of relatively uniform size, from approximately 3–12 mm depending on whether small or large type of curd is desired, and possibly covered with a creamy mixture.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Gelatin and starches: These substances can be used in the same function as stabilizers, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice taking into account any use of the stabilizers/thickeners listed in section 4;
- Sodium chloride and Potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable processing aids.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat:	0%	Not restricted	4–5%
Fat free dry matter:	18%	Restricted by the MFFB	

[1] The cheese has been kept in such a way that no rind is developed (a "rindless" cheese).

Formerly CODEX STAN C-16-1968. Adopted in 1968. Revision 2007.

Compositional modifications beyond the minimum and maximum specified above for fat free dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass [2]	Surface/rind treatment
Colours:	–	–
Bleaching agents:	–	–
Acids:	X	–
Acidity regulators:	X	–
Stabilizers:	X[1]	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	X	–
Foaming agents:	–	–
Anti–caking agents:	–	–

[1] Stabilizers including modified starches may be used in compliance with the definition of milk products and only to the extent they are functionally necessary, taking into account any use of gelatine and starches as provided for in section 3.2.
[2] Cheese mass includes creaming mixture.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Preservatives		
200	Sorbic acid	1 000 mg/kg singly or in combination as sorbic acid
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
280	Propionic acid	Limited by GMP
281	Sodium propionate	
282	Calcium propionate	
283	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
261(i)	Potassium acetate	Limited by GMP

INS no.	Name of additive	Maximum level
261(ii)	Potassium diacetate	Limited by GMP
262(i)	Sodium acetate	Limited by GMP
263	Calcium acetate	Limited by GMP
325	Sodium lactate	Limited by GMP
326	Potassium lactate	Limited by GMP
327	Calcium lactate	Limited by GMP
350(i)	Sodium hydrogen malate	Limited by GMP
350(ii)	Sodium malate	Limited by GMP
351(i)	Potassium hydrogen malate	Limited by GMP
351(ii)	Potassium malate	Limited by GMP
352(ii)	Calcium malate	Limited by GMP
500(i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonate	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
504(ii)	Magnesium hydrogen carbonate	Limited by GMP
575	Glucono-delta-lactone	Limited by GMP
577	Potassium gluconate	Limited by GMP
578	Calcium gluconate	Limited by GMP
Acids		
260	Acetic acid	Limited by GMP
270	Lactic acid (L-, D- and DL-)	Limited by GMP
296	Malic acid (DL-)	Limited by GMP
330	Citric acid	Limited by GMP
338	Orthophosphoric acid	880 mg/kg as phosphorus
507	Hydrochloric acid	Limited by GMP
Stabilizers		
331(i)	Sodium dihydrogen citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
333	Calcium citrates	Limited by GMP
339(i)	Monosodium orthophosphate	1 300 mg/kg, singly or in combination, expressed as phosphorus
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
341(iii)	Tricalcium orthophosphate	
342(i)	Monoammonium orthophosphate	
342(ii)	Diammonium orthophosphate	
343(ii)	Dimagnesium orthophosphate	
343(iii)	Trimagnesium orthophosphate	

INS no.	Name of additive	Maximum level
450(i)	Disodium diphosphate	1 300 mg/kg, singly or in combination, expressed as phosphorus
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iv)	Calcium polyphosphate	
452(v)	Ammonium polyphosphate	
400	Alginic acid	Limited by GMP
401	Sodium alginate	Limited by GMP
402	Potassium alginate	Limited by GMP
403	Ammonium alginate	Limited by GMP
404	Calcium alginate	Limited by GMP
405	Propylene glycol alginate	5 000 mg/kg
406	Agar	Limited by GMP
407	Carrageenan and its Na, K, NH_4, Ca and Mg salts (includes Furcelleran)	Limited by GMP
407a	Processed Euchema seaweed PES	Limited by GMP
410	Carob bean gum	Limited by GMP
412	Guar gum	Limited by GMP
413	Tragacanth gum	Limited by GMP
415	Xanthan gum	Limited by GMP
416	Karaya gum	Limited by GMP
417	Tara gum	Limited by GMP
440	Pectins	Limited by GMP
466	Sodium carboxymethyl cellulose	Limited by GMP
Stabilizers (modified starches)		
1400	Dextrins, roasted starch	Limited by GMP
1401	Acid-treated starch	Limited by GMP
1402	Alkaline-treated starch	Limited by GMP
1403	Bleached starch	Limited by GMP
1404	Oxidized starch	Limited by GMP
1405	Starches, enzyme-treated	Limited by GMP
1410	Monostarch phosphate	Limited by GMP
1412	Distarch phosphate	Limited by GMP
1413	Phosphated distarch phosphate	Limited by GMP
1414	Acetylated distarch phosphate	Limited by GMP
1420	Starch acetate	Limited by GMP
1422	Acetylated distarch adipate	Limited by GMP
1440	Hydroxypropyl starch	Limited by GMP
1442	Hydroxypropyl distarch phosphate	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Cottage Cheese may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used. The name may be translated into other languages so that the consumer in the country of retail sale will not be mislead

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers include nutritional claims in accordance with the *Guideline for the Use of Nutritional Claims*[2] (CAC/GL 23-1997). In addition the appropriate characterizing terms describing the nature or style of the product may accompany the name of the food. Such terms include "dry curd" or "creamed"

[2] For the purpose of comparative nutritional claims, the fat content of 4% constitutes the reference."

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale, either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR COULOMMIERS

CODEX STAN 274-1969

1. SCOPE

This Standard applies to Coulommiers intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Coulommiers is a soft, surface ripened, primarily mould ripened cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978) which has a shape of a flat cylinder or sectors thereof. The body has a near white through to light yellow colour and a soft-textured (when pressed by thumb), but not crumbly texture, ripened from the surface to the center of the cheese. Gas holes are generally absent, but few openings and splits are acceptable. A rind is to be developed that is soft and entirely covered with white mould but may have red, brownish or orange coloured spots. Whole cheese may be cut or formed into sectors prior to or after the mould development.

For Coulommiers ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 10 days at 10–16 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Coulommiers intended for further processing need not exhibit the same extent of ripening when justified through technical and/or trade needs.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms, including *Geotrichum candidum*, *Brevibacterium linens*, and yeast;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and Potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable processing aids;
- Safe and suitable enzymes to enhance the ripening process;
- Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of

Formerly CODEX STAN C-18-1969. Adopted in 1969. Revision 2007.

cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level
Milkfat in dry matter:	40%	Not restricted	40% to 50%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 40% but less than 50%:		42%
	Equal to or above 50% but less than 60%:		46%
	Equal to or above 60%:		52%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

3.4 Essential sizes and shapes

Maximum height: approx. 5 cm;
Weight: Whole cheese of flat cylinder: min. 300 g.

3.5 Essential ripening procedure

Rind formation and maturation (proteolysis) from the surface to the center is predominantly caused by *Penicillium candidum* and/or *Penicillium camembertii* and *Penicillium caseicolum.*

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	–	–
Foaming agents:	–	–
Anti-caking agents:	–	–

[1] Only to obtain the colour characteristics, as described in Section 2.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl esters	
160a(ii)	Carotenes, vegetable	600 mg/kg
Acidity regulators		
575	Glucono delta-lactone	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice and Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Coulommiers may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is above the reference range specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[1].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[2] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

[1] For the purpose of comparative nutritional claims, the minimum fat content of 40% fat in dry matter constitutes the reference.

[2] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

7.4 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Coulommiers

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Method of manufacture

1.1 Fermentation procedure: Microbiologically derived acid development.

1.2 Type of coagulation: Coagulation of the milk protein is typically obtained through the combined action of microbial acidification and proteases (e.g. rennet) at an appropriate coagulation temperature.

CODEX STANDARD FOR CREAM CHEESE

CODEX STAN 275-1973

1. SCOPE

This Standard applies to Cream Cheese intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

In some countries, the term "cream cheese" is used to designate cheeses, such as high fat ripened hard cheese, that do not conform to the description I Section 2. This Standard does not apply to such cheeses.

2. DESCRIPTION

Cream Cheese is a soft, spreadable, unripened and rindless[1] cheese in conformity with the *Standard for Unripened Cheeses Including Fresh Cheeses* (CODEX STAN 221-2001) and the *General Standard for Cheese* (CODEX STAN A-6-1978). The cheese has a near white through to light yellow colour. The texture is spreadable and smooth to slightly flaky and without holes, and the cheese spreads and mixes readily with other foods.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Milk and/or products obtained from milk.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and Potassium Chloride as a salt substitute;
- Potable water;
- Safe and suitable processing aids;
- Gelatine and starches: These substances can be used in the same function as stabilizers, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice taking into account any use of the stabilizers/thickeners listed in section 4;
- Vinegar.

[1] The cheese has been kept in such a way that no rind is developed (a "rindless" cheese).

Formerly CODEX STAN C-31-1973. Adopted in 1973. Revision 2007.

3.3 Composition

Milk constituent	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milk fat in dry matter:	25%	Not restricted	60–70%
Moisture on fat free basis:	67%	–	Not specified
Dry matter:	22%	Restricted by the MMFBFF	Not specified

Compositional modifications of Cream Cheese beyond the minima and maxima specified *above for milkfat, moisture and dry matter are not considered to be in compliance with section 4.3.3 of the General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	X	–
Acidity regulators:	X	–
Stabilizers:	X[2]	–
Thickeners:	X[2]	–
Emulsifiers:	X	–
Antioxidants:	X	–
Preservatives:	X[2]	–
Foaming agents:	X[3]	–
Anticaking agents:	–	–

[1] Only to obtain the colour characteristics, as described in Section 2.
[2] Stabilizers and thickeners including modified starches may be used in compliance with the definition of milk products and only to heat treated products to the extent they are functionally necessary, taking into account any use of gelatine and starches as provided for in section 3.2.
[3] For whipped products, only.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Preservatives		
200	Sorbic acid	1 000 mg/kg singly or in combination as sorbic acid
201	Sodium sorbate	
202	Potassium sorbate	
203	Calcium sorbate	
234	Nisin	12.5 mg/kg
280	Propionic acid	Limited by GMP
281	Sodium propionate	
282	Calcium propionate	
283	Potassium propionate	
Acidity regulators		
170(i)	Calcium carbonate	Limited by GMP
261(i)	Potassium acetate	Limited by GMP
261(ii)	Potassium diacetate	Limited by GMP
262(i)	Sodium acetate	Limited by GMP
263	Calcium acetate	Limited by GMP
325	Sodium lactate	Limited by GMP
326	Potassium lactate	Limited by GMP
327	Calcium lactate	Limited by GMP
350(i)	Sodium hydrogen malate	Limited by GMP
350(ii)	Sodium malate	Limited by GMP
351(i)	Potassium hydrogen malate	Limited by GMP
351(ii)	Potassium malate	Limited by GMP
352(ii)	Calcium malate	Limited by GMP
500(i)	Sodium carbonate	Limited by GMP
500(ii)	Sodium hydrogen carbonate	Limited by GMP
500(iii)	Sodium sesquicarbonate	Limited by GMP
501(i)	Potassium carbonate	Limited by GMP
501(ii)	Potassium hydrogen carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
504(ii)	Magnesium hydrogen carbonate	Limited by GMP
575	Glucono-delta-lactone	Limited by GMP
577	Potassium gluconate	Limited by GMP
578	Calcium gluconate	Limited by GMP
Acids		
260	Acetic acid	Limited by GMP
270	Lactic acid (L-, D-, and DL-)	Limited by GMP
296	Malic acid (DL-)	Limited by GMP
330	Citric acid	Limited by GMP
338	Orthophosphoric acid	880 mg/kg as phosphorus
507	Hydrochloric acid	Limited by GMP
331(i)	Sodium dihydrogen citrate	Limited by GMP
332(i)	Potassium dihydrogen citrate	Limited by GMP
333	Calcium citrates	Limited by GMP

INS no.	Name of additive	Maximum level
334	Tartaric acid (L(+)-)	1 500 mg/kg singly or in combination as tartaric acid
335(i)	Monosodium tartrate	
335(ii)	Disodium tartrate	
336(i)	Monopotassium tartrate	
336 (ii)	Dipotassium tartrate	
337	Potassium sodium tartrate	
Stabilizers		
339(i)	Monosodium orthophosphate	4 400 mg/kg singly or in combination, expressed as phosphorus
339(ii)	Disodium orthophosphate	
339(iii)	Trisodium orthophosphate	
340(i)	Monopotassium orthophosphate	
340(ii)	Dipotassium orthophosphate	
340(iii)	Tripotassium orthophosphate	
341(i)	Monocalcium orthophosphate	
341(ii)	Dicalcium orthophosphate	
341(iii)	Tricalcium orthophosphate	
342(i)	Monoammonium orthophosphate	
342(ii)	Diammonium orthophosphate	
343(ii)	Dimagnesium orthophosphate	
343(iii)	Trimagnesium orthophosphate	
450(i)	Disodium diphosphate	
450(iii)	Tetrasodium diphosphate	
450(v)	Tetrapotassium diphosphate	
450(vi)	Dicalcium diphosphate	
451(i)	Pentasodium triphosphate	
451(ii)	Pentapotassium triphosphate	
452(i)	Sodium polyphosphate	
452(ii)	Potassium polyphosphate	
452(iv)	Calcium polyphosphate	
452(v)	Ammonium polyphosphate	
400	Alginic acid	Limited by GMP
401	Sodium alginate	Limited by GMP
402	Potassium alginate	Limited by GMP
403	Ammonium alginate	Limited by GMP
404	Calcium alginate	Limited by GMP
405	Propylene glycol alginate	5 000 mg/kg
406	Agar	Limited by GMP
407	Carrageenan and its Na, K, NH_4, Ca and Mg salts (includes Furcelleran)	Limited by GMP
407a	Processed Euchema seaweed PES	Limited by GMP
410	Carob bean gum	Limited by GMP
412	Guar gum	Limited by GMP
413	Tragacanth gum	Limited by GMP
415	Xanthan gum	Limited by GMP
416	Karaya gum	Limited by GMP
417	Tara gum	Limited by GMP
418	Gellan gum	Limited by GMP
466	Sodium carboxymethyl cellulose	Limited by GMP

INS no.	Name of additive	Maximum level
Stabilizers (modified starches)		
1400	Dextrins, roasted starch	Limited by GMP
1401	Acid-treated starch	Limited by GMP
1402	Alkaline treated starch	Limited by GMP
1403	Bleached starch	Limited by GMP
1404	Oxidized starch	Limited by GMP
1405	Starches, enzyme-treated	Limited by GMP
1410	Monostarch phosphate	Limited by GMP
1412	Distarch phosphate	Limited by GMP
1413	Phosphated distarch phosphate	Limited by GMP
1414	Acetylated distarch phosphate	Limited by GMP
1420	Starch Acetate	Limited by GMP
1422	Acetylated distarch adipate	Limited by GMP
1440	Hydroxypropyl starch	Limited by GMP
1442	Hydroxypropyl distarch phosphate	Limited by GMP
Emulsifiers		
322	Lecithins	Limited by GMP
470(i)	Salt of myristic, palmitic and stearic acids wit ammonia, calcium, potassium and sodium	Limited by GMP
470(ii)	Salt of oleic acid with calcium, potassium and sodium	Limited by GMP
471	Mono- and di-Glycerides of fatty acids	Limited by GMP
472a	Acetic and fatty acid esters of Glycerol	Limited by GMP
472b	Lactic and fatty acid esters of Glycerol	Limited by GMP
472c	Citric and fatty acid esters of Glycerol	Limited by GMP
472e	Diacetyltartaric and fatty acid esters of glycerol	10 000 mg/kg
Antioxidants		
300	Ascorbic acid	Limited by GMP
301	Sodium ascorbate	Limited by GMP
302	Calcium ascorbate	Limited by GMP
304	Ascorbyl palmitate	500 mg/kg singly or in combination as ascorbyl stearate
305	Ascorbyl stearate	
307b	Mixed tocopherols concentrate	200 mg/kg singly or in combination
307c	dl-alpha-Tocopherol	
Colours		
160a(i)	beta-Carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8′-Carotenal	
160f	beta-apo-8′-Carotenoic acid, methyl or ethyl ester	
160a(ii)	beta-Carotenes, vegetable	600 mg/kg
171	Titanium dioxide	Limited by GMP
Foaming agent		
290	Carbon dioxide	Limited by GMP
941	Nitrogen	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Cream Cheese may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used. The name may be translated into other languages so that the consumer in the country of retail sale will not be mislead

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but equal to or above 40% fat in dry matter as specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. The designation of products in which the fat content is below 40% fat in dry matter but above the absolute minimum specified in section 3.3 of this Standard shall *either* be accompanied by an appropriate qualifier describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass), either as part of the name or in a prominent position in the same field of vision, *or alternatively* the name specified in the national legislation of the country in which the product is manufactured and/or sold or with a

name existing by common usage, in either case provided that the designation used does not create an erroneous impression the retail sale regarding the character and identity of the cheese.

Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[2].

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[3] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale , either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

7.4 Labelling of non-retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

[2] For the purpose of comparative nutritional claims, the minimum fat content of 60 % fat in dry matter constitutes the reference.

[3] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

CODEX STANDARD FOR CAMEMBERT

CODEX STAN 276-1973

1. SCOPE

This Standard applies to Camembert intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Camembert is a soft surface ripened, primarily mould ripened cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978), which has a shape of a flat cylinder or sectors thereof. The body has a near white through to light yellow colour and a soft-textured (when pressed by thumb), but not crumbly texture, ripened from the surface to the center of the cheese. Gas holes are generally absent, but few openings and splits are acceptable. A rind is to be developed that is soft and entirely covered with white mould but may have red, brownish or orange coloured spots. Whole cheese may be cut or formed into sectors prior to or after the mould development.

For Camembert ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 10 days at 10–16 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Camembert intended for further processing need not exhibit the same extent of ripening when justified through technical and/or trade needs.

Carré de Camembert is a soft surface ripened cheese with a square shape and which comply with all other criteria and requirements specified for Camembert.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms, including Geotrichum candidum, Brevibacterium linens, and yeast;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and Potassium Chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;

Formerly CODEX STAN C-33-1973. Adopted in 1973. Revision 2007.

– Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent:	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	30%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 30% but less than 40%:		38%
	Equal to or above 40% but less than 45%:		41%
	Equal to or above 45% but less than 55%:		43%
	Equal to or above 55%		48%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

3.4 Essential sizes and shapes

Maximum height: approx. 5 cm;
Weight: Whole cheese of flat cylinder (Camembert)
or square (Carré de Camembert): approx. 80 g to 500 g.

3.5 Essential ripening procedure

Rind formation and maturation (proteolysis) from the surface to the centre is predominantly caused by *Penicillium candidium* and /or *Penicillium camembertii* and *Penicillium caseicolum*

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	–
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	–	–
Foaming agents:	–	–
Anticaking agents:	–	–

[1] Only to obtain the colour characteristics, as described in Section 2.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-Carotene (Synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8′-Carotenal	
160f	beta-apo-8′-Carotenoic acid, methyl or ethyl esters	
160a(ii)	beta-Carotenes, vegetable	600 mg/kg
Acidity regulators		
575	Glucono delta-lactone	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RC 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The names Camembert and Carré de Camembert may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The term "Carré de" may be replaced by other appropriate term(s) related to shape that are suitable in the country of retail sale.

The use of the names is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[1].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation[2] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale. either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

[1] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

[2] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

7.4 Labelling of non retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Camembert

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Method of manufacture

1.1 Fermentation procedure: Microbiologically derived acid development.

1.2 Type of coagulation: Coagulation of the milk protein is typically obtained through the combined action of microbial acidification and proteases (e.g. rennet) at an appropriate coagulation temperature.

CODEX STANDARD FOR BRIE

CODEX STAN 277-1973

1. SCOPE

This Standard applies to Brie intended for direct consumption or for further processing in conformity with the description in Section 2 of this Standard.

2. DESCRIPTION

Brie is a soft surface ripened, primarily white mould ripened cheese in conformity with the *General Standard for Cheese* (CODEX STAN A-6-1978), which has a shape of a flat cylinder or sectors thereof. The body has a near white through to light yellow colour and a soft-textured (when thumbs-pressed), but not crumbly texture, ripened from the surface to the center of the cheese. Gas holes are generally absent, but few openings and splits are acceptable. A rind is to be developed that is soft and entirely covered with white mould but may have red, brownish or orange coloured spots. Whole cheese may be cut or formed into sectors prior to or after the mould development.

For Brie ready for consumption, the ripening procedure to develop flavour and body characteristics is normally from 10 days at 10–16 °C depending on the extent of maturity required. Alternative ripening conditions (including the addition of ripening enhancing enzymes) may be used, provided the cheese exhibits similar physical, biochemical and sensory properties as those achieved by the previously stated ripening procedure. Brie intended for further processing need not exhibit the same extent of ripening when justified through technical and/or trade needs

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw materials

Cows' milk or buffaloes' milk, or their mixtures, and products obtained from these milks.

3.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms, including *Geotrichum candidum*, *Brevibacterium linens*, and yeast;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute;
- Potable water;
- Safe and suitable enzymes to enhance the ripening process;
- Safe and suitable processing aids;

Formerly CODEX STAN C-34-1973. Adopted in 1973. Revision 2007.

– Rice, corn and potato flours and starches: Notwithstanding the provisions in the *General Standard for Cheese* (CODEX STAN A-6-1978), these substances can be used in the same function as anti-caking agents for treatment of the surface of cut, sliced, and shredded products only, provided they are added only in amounts functionally necessary as governed by Good Manufacturing Practice, taking into account any use of the anti-caking agents listed in section 4.

3.3 Composition

Milk constituent:	Minimum content *(m/m)*	Maximum content *(m/m)*	Reference level *(m/m)*
Milkfat in dry matter:	40%	Not restricted	45% to 55%
Dry matter:	Depending on the fat in dry matter content, according to the table below.		
	Fat in dry matter content *(m/m):*		**Corresponding minimum dry matter content** *(m/m):*
	Equal to or above 40% but less than 45%:		42%
	Equal to or above 45% but less than 55%:		43%
	Equal to or above 55% but less than 60%:		48%
	Equal to or above 60%:		51%

Compositional modifications beyond the minima and maxima specified above for milkfat and dry matter are not considered to be in compliance with section 4.3.3 of the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999).

3.4 Essential sizes and shapes

Maximum height: approx. 5 cm;
Weight: Whole cheese of flat cylinder: approx. 500 g to 3 500 g

3.5 Essential ripening procedure

Rind formation and maturation (proteolysis) from the surface to the centre is predominantly caused by *Penicillium candidium* and/or *Penicillium camembertii* and *Penicillium caseicolum*

4. FOOD ADDITIVES

Only those additives classes indicated as justified in the table below may be used for the product categories specified. Within each additive class, and where permitted according to the table, only those food additives listed below may be used and only within the functions and limits specified.

Additive functional class	Justified use	
	Cheese mass	Surface/rind treatment
Colours:	X[1]	-
Bleaching agents:	–	–
Acids:	–	–
Acidity regulators:	X	–
Stabilizers:	–	–
Thickeners:	–	–
Emulsifiers:	–	–
Antioxidants:	–	–
Preservatives:	–	–
Foaming agents:	–	–
Anti-caking agents:	–	–

[1] Only to obtain the colour characteristics, as described in Section 2.
X The use of additives belonging to the class is technologically justified.
– The use of additives belonging to the class is not technologically justified.

INS no.	Name of additive	Maximum level
Colours		
160a(i)	beta-Carotene (synthetic)	35 mg/kg singly or in combination
160a(iii)	beta-Carotene (*Blakeslea trispora*)	
160e	beta-apo-8'-Carotenal	
160f	beta-apo-8'-Carotenoic acid, methyl or ethyl esters	
160a(ii)	Carotenes, vegetable	600 mg/kg
Acidity regulators		
575	Glucono delta-lactone	Limited by GMP

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX STAN 193-1995) and the maximum residue limits for pesticides and veterinary drugs established by the CAC.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Milk and Milk Products* (CAC/RCP 57-2004) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice. The products should comply with any microbiological criteria established in accordance

with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

7. LABELLING

In addition to the provisions of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and the *General Standard for the Use of Dairy Terms* (CODEX STAN 206-1999), the following specific provisions apply:

7.1 Name of the food

The name Brie may be applied in accordance with section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods*, provided that the product is in conformity with this Standard. Where customary in the country of retail sale, alternative spelling may be used.

The use of the name is an option that may be chosen only if the cheese complies with this standard. Where the name is not used for a cheese that complies with this standard, the naming provisions of the *General Standard for Cheese* (CODEX STAN A-6-1978) apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in section 3.3 of this Standard shall be accompanied by an appropriate qualification describing the modification made or the fat content (expressed as fat in dry matter or as percentage by mass whichever is acceptable in the country of retail sale), either as part of the name or in a prominent position in the same field of vision. Suitable qualifiers are the appropriate characterizing terms specified in Section 7.3 of the *General Standard for Cheese* (CODEX STAN A-6-1978) or a nutritional claim in accordance with the *Guidelines for the Use of Nutritional Claims* (CAC/GL 23-1997)[1].

The designation may also be used for cut, sliced, shredded or grated products made from cheese which cheese is in conformity with this Standard.

7.2 Country of origin

The country of origin (which means the country of manufacture, not the country in which the name originated) shall be declared. When the product undergoes substantial transformation [2] in a second country, the country in which the transformation is performed shall be considered to be the country of origin for the purpose of labelling.

7.3 Declaration of milkfat content

The milk fat content shall be declared in a manner found acceptable in the country of retail sale. either (i) as a percentage by mass, (ii) as a percentage of fat in dry matter, or (iii) in grams per serving as quantified in the label, provided that the number of servings is stated.

[1] For the purpose of comparative nutritional claims, the minimum fat content of 45% fat in dry matter constitutes the reference.

[2] For instance, repackaging, cutting, slicing, shredding and grating is not regarded as substantial transformation.

7.4 Labelling of non retail containers

Information specified in Section 7 of this Standard and Sections 4.1 to 4.8 of the *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985) and, if necessary, storage instructions, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name of the manufacturer or packer shall appear on the container, and in the absence of such a container, on the product itself. However, lot identification and the name and address may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. METHODS OF SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

APPENDIX

Information on usual patterns of manufacturing Brie

The information below is intended for voluntary application by commercial partners and not for application by governments.

1. Method of manufacture

1.1 Fermentation procedure: Microbiologically derived acid development.

1.2 Type of coagulation: Coagulation of the milk protein is typically obtained through the combined action of microbial acidification and proteases (e.g. rennet) at an appropriate coagulation temperature.

CODEX INTERNATIONAL STANDARD FOR EXTRA HARD GRATING CHEESE

CODEX STAN 278-1978

1. DESIGNATION OF CHEESE

Extra Hard Grating

2. DEPOSITING COUNTRY

United States of America

3. RAW MATERIALS

3.1 **Kind of milk:** cow's milk, goat's milk or sheep's milk and mixtures of these milks.

3.2 **Authorized additions**

3.2.1 ***Necessary additions:***

- cultures of harmless lactic acid producing bacteria (starter)
- rennet or other suitable coagulating enzymes
- sodium chloride.

3.2.2 ***Optional additions:***

- calcium chloride, max.200 mg anhydrous/kg of the milk used
- harmless flavour producing bacteria
- harmless enzymes to assist in flavour development (solids of preparation not to exceed 0.1% of weight of milk used)
- chlorophyll, including copper chlorophyll complex, max. 15 mg/kg cheese
- sorbic acid or its sodium or potassium salts, maximum 1 g/kg calculated as sorbic acid in the final product.

4. PRINCIPAL CHARACTERISTICS OF THE CHEESE READY FOR CONSUMPTION

4.1 **Type**

4.1.1 ***Consistency:*** extra hard, suitable for grating.

4.1.2 ***Short description:*** extra hard, dry, slightly brittle, suitable for grating. Period of curing at least 6 months.

4.2 **Shape:** various.

4.3 **Dimensions and weights:** various.

Formerly CODEX STAN C-35-1978. Adopted in 1978.

4.4 **Rind** (where present)
4.4.1 ***Consistency:*** extra hard.

4.4.2 ***Appearance:*** dry, may be coated with vegetable oil, food grade wax or plastic materials.

4.4.3 ***Colour:*** amber.

4.5 **Body**
4.5.1 ***Texture:*** granular, slightly brittle.

4.5.2 ***Colour:*** natural uncoloured to light cream colour.

4.6 **Holes** (when holes are a typical characteristic of the variety)
4.6.1 ***Number:*** few.

4.6.2 ***Shape:*** small, round.

4.6.3 ***Size:*** approximately 1–2 mm.

4.6.4 ***Appearance:*** characteristic gas holes.

4.7 **Minimum fat content in dry matter:** 32%

4.8 **Maximum moisture content:** 36%

5. METHOD OF MANUFACTURE

5.1 **Method of coagulation:** rennet or other suitable coagulating enzymes; with the possible addition of a lactic acid starter.

5.2 **Heat treatment:** milk may be raw or pasteurized. If pasteurized the milk is heated to not less than 72 °C (161 °F) for 15 seconds.

5.3 **Fermentation procedure:** lactic acid fermentation or other flavour producing cultures and enzymes.

5.4 **Maturation procedure:** after the curd which may be lightly salted is shaped into forms, the cheese may again be salted in brine, dry salted or both; held in a cool and well aerated or temperature controlled room for not less than 6 months.

6. SAMPLING AND ANALYSIS

See CODEX STAN 234-1999.

7. MARKING AND LABELLING

7.1 Only cheese conforming with this standard may be designated Extra Hard Grating Cheese or any recognized variety name in the consuming country. A "coined" or "fanciful" name, may be used however, provided it is not misleading and is accompanied by the phrase "Extra Hard Grating Cheese".

7.2 It shall be labelled in conformity with the appropriate sections of the *General Standard for Cheese* (CODEX STAN A-6-1978).

CODEX GENERAL STANDARD FOR THE USE OF DAIRY TERMS

CODEX STAN 206-1999[1]

1. SCOPE

This General Standard applies to the use of dairy terms in relation to foods to be offered to the consumer or for further processing.

2. DEFINITIONS

2.1 ***Milk*** is the normal mammary secretion of milking animals obtained from one or more milkings without either addition to it or extraction from it, intended for consumption as liquid milk or for further processing.

2.2 ***Milk product*** is a product obtained by any processing of milk, which may contain food additives, and other ingredients functionally necessary for the processing.

2.3 ***Composite milk product*** is a product of which the milk, milk products or milk constituents are an essential part in terms of quantity in the final product, as consumed provided that the constituents not derived from milk are not intended to take the place in part or in whole of any milk constituent.

2.4 ***A reconstituted milk product*** is a product resulting from the addition of water to the dried or concentrated form of the product in the amount necessary to re-establish the appropriate water to solids ratio.

2.5 ***A recombined milk product*** is a product resulting from the combining of milkfat and milk-solids-non-fat in their preserved forms with or without the addition of water to achieve the appropriate milk product composition.

2.6 ***Dairy terms*** means names, designations, symbols, pictorial or other devices which refer to or are suggestive, directly or indirectly, of milk or milk products.

3. GENERAL PRINCIPLES

Foods shall be described or presented in such a manner as to ensure the correct use of dairy terms intended for milk and milk products, to protect consumers from being confused or misled and to ensure fair practices in the food trade.

[1] This Standard replaced the Code of Principles Concerning Milk and Milk Products.

4. APPLICATION OF DAIRY TERMS

4.1 General requirements

4.1.1 The name of the food shall be declared in accordance with Section 4.1 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985).

4.1.2 A word or words denoting the animal or, in the case of mixtures, all animals from which the milk has been derived shall be inserted immediately before or after the designation of the product. Such declarations are not required if the consumer would not be misled by their omission.

4.2 Use of the term milk

4.2.1 Only a food complying with the definition in Section 2.1 may be named "milk". If such a food is offered for sale as such it shall be named "raw milk" or other such appropriate term as would not mislead or confuse the consumer.

4.2.2 Milk which is modified in composition by the addition and/or withdrawal of milk constituents may be identified with a name using the term "milk", provided that a clear description of the modification to which the milk has been subjected is given in close proximity to the name.

4.2.3 Notwithstanding the provisions of Section 4.2.2 of this Standard, milk which is adjusted for fat and/or protein content and which is intended for direct consumption, may also be named "milk" provided that:

- it is sold only where such adjustment is permitted in the country of retail sale;
- the minimum and maximum limits of fat and/or protein content (as the case may be) of the adjusted milk are specified in the legislation of the country of retail sale. In this case the protein content shall be within the limits of natural variation within that country;
- the adjustment has been performed according to methods permitted by the legislation of the country of retail sale, and only by the addition and/or withdrawal of milk constituents, without altering the whey protein to casein ratio; and
- the adjustment is declared in accordance with Section 4.2.2 of this standard.

4.3 Use of the names of milk products in Codex commodity standards

4.3.1 Only a product complying with the provisions in a Codex standard for a milk product may be named as specified in the Codex standard for the product concerned.

4.3.2 Notwithstanding the provisions of Section 4.3.1of this Standard and Section 4.1.2 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), a milk product may be named as specified in the Codex standard for the relevant milk product when manufactured from milk, the fat and/or protein content of which has been adjusted, provided that the compositional criteria in the relevant standard are met.

4.3.3. Products that are modified through the addition and/or withdrawal of milk constituents may be named with the name of the relevant milk product in association with a clear description of the modification to which the milk product has been subjected provided that the essential product characteristics are maintained and that the limits of such compositional modifications shall be detailed in the standards concerned as appropriate.

4.4 Use of terms for reconstituted and recombined milk products

Milk and milk products may be named as specified in the Codex Standard for the relevant milk product when made from recombined or reconstituted milk or from recombination or reconstitution of milk products in accordance with Section 4.1.2 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), if the consumer would not be misled or confused.

4.5 Use of terms for composite milk products

A product complying with the description in Section 2.3 may be named with the term "milk" or the name specified for a milk product as appropriate, provided that a clear description of the other characterizing ingredient(s) (such as flavouring foods, spices, herbs and flavours) is given in close proximity to the name.

4.6 Use of dairy terms for other foods

4.6.1 The names referred to in Sections 4.2 to 4.5 may only be used as names or in the labelling of milk, milk products or composite milk products.

4.6.2 However, the provision in Section 4.6.1 shall not apply to the name of a product the exact nature of which is clear from traditional usage or when the name is clearly used to describe a characteristic quality of the non-milk product.

4.6.3 In respect of a product which is not milk, a milk product or a composite milk product, no label, commercial document, publicity material or any form of point of sale presentation shall be used which claims, implies or suggests that the product is milk, a milk product or a composite milk product, or which refers to one or more of these products[2].

4.6.4 However, with regard to products referred to in Section 4.6.3, which contain milk or a milk product, or milk constituents, which are an essential part in terms of characterization of the product, the term "milk", or the name of a milk product may be used in the description of the true nature of the product, provided that the constituents not derived from milk are not intended to take the place, in part or in whole, of any milk constituent. For these products dairy terms may be used only if the consumer would not be misled.

[2] This excludes descriptive names as defined in Section 4.1.1.3 of the General Standard for the Labelling of Prepackaged Foods (GSLPF) and ingredients lists as defined in Section 4.2.1.2 of the GSLPF providing the consumer would not be misled.

If however the final product is intended to substitute milk, a milk product or composite milk product, dairy terms shall not be used.

For products referred to in Section 4.6.3 which contain milk, or a milk product, or milk constituents, which are not an essential part in terms of characterization of the product, dairy terms can only be used in the list of ingredients, in accordance with the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985). For these products dairy terms cannot be used for other purposes.

5. LABELLING OF PREPACKAGED FOODS

Prepackaged milk, milk products and composite milk products shall be labelled in accordance with Section 4 of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), except to the extent otherwise expressly provided in a specific Codex standard or in Section 4 of this Standard.

GUIDELINES FOR THE PRESERVATION OF RAW MILK BY USE OF THE LACTOPEROXIDASE SYSTEM

CAC/GL 13-1991

GUIDELINES FOR THE PRESERVATION OF RAW MILK BY USE OF THE LACTOPEROXIDASE SYSTEM

CAC/GL 13-1991

INTRODUCTION

Milk is an easily perishable raw material. Contaminating bacteria may multiply rapidly and render it unsuitable for processing and/or unfit for human consumption. Bacterial growth can be retarded by refrigeration, thereby slowing down the rate of deterioration. Under certain conditions refrigeration may not be feasible due to economical and/or technical reasons. Difficulties in applying refrigeration are specially a problem for certain areas in countries setting up or expanding their milk production. In these situations, it would be beneficial to have access to a method, other than refrigeration, for retarding bacterial growth in raw milk during collection and transportation to the dairy processing plant.

In 1967 the FAO/WHO Expert Panel on Milk Quality concluded that the use of hydrogen peroxide might be an acceptable alternative in the early stages of development of an organized dairy industry, provided that certain conditions were complied with. However, this method has not achieved any general acceptance as it has several drawbacks, most important of which is the difficulty of controlling its use: it may be misused to disguise milk of basic hygienic quality produced under poor hygienic conditions. The toxicological aspects of the use of relatively high concentrations of hydrogen peroxide in milk have also been questioned.

A chemical method for preserving milk would still be of great advantage in certain situations. The search for such a method has therefore continued. Interest has recently been focused on the indigenous antibacterial systems in milk to determine if these could be applied practically to preserve raw milk. During the last decade, basic and applied research has demonstrated that one of these systems, the lactoperoxidase/thiocyanate/hydrogen peroxide system (LP-system) can be used successfully for this purpose.

1. SCOPE

1.1 This Code of Practice describes the use of the lactoperoxidase system for preventing bacterial spoilage of raw milk (bovine and buffalo) during collection and transportation to a dairy processing plant. It describes the principles of the method, in what situations it can be used, its practical application and control of the method. It should be stressed that this method should be utilized when refrigeration of the raw milk is not feasible.

2. PRINCIPLES OF THE METHOD

2.1 The lactoperoxidase/thiocyanate/hydrogen peroxide system is an indigenous antibacterial system in milk and human saliva. The enzyme lactoperoxidase is present in bovine and buffalo milk in relatively high concentrations. It can oxidise thiocyanate

ions in the presence of hydrogen peroxide. By this reaction, thiocyanate is converted into hypothiocyanous acid (HOSCN). At the pH of milk HOSCN is dissociated and exists mainly in the form of hypothiocyanate ions ($OSCN^-$). This agent reacts specifically with free sulphydryl groups, thereby inactivating several vital metabolic bacterial enzymes, consequently blocking their metabolism and ability to multiply. As milk proteins contain very few sulphydryl groups and those that are present are relatively inaccessible to $OSCN^-$ (masked), the reaction of this compound is in milk quite specific and is directed against the bacteria present in the milk.

2.2 The effect against bacteria is both species and strain dependent. Against a mixed raw milk flora, dominated by mesophilic bacteria, the effect is bacteriostatic (predominantly inhibitory). Against some gram-negative bacteria, i.e. pseudomonads, *Escherichia coli,* the effect is bactericidal. Due to the mainly bacteriostatic effect of the system it is not possible to disguise poor quality milk, which originally contained a high bacterial population, by applying this method.

2.3 The antibacterial oxidation products of thiocyanate are not stable at neutral pH. Any surplus of these decomposes spontaneously to thiocyanate. The velocity of this reaction is temperature dependent, i.e. more rapid at higher temperatures. Pasteurisation of the milk will ensure a complete removal of any residual concentrations of the active oxidation products.

2.4 Oxidation of thiocyanate does not occur to any great extent in milk when it has left the udder. It can, however, be initiated through addition of small concentrations of hydrogen peroxide (see Section 4). The high concentrations of hydrogen peroxide used to preserve milk (300–800 ppm), destroy the enzyme lactoperoxidase and thereby preclude the oxidation of thiocyanate. With this method the antibacterial effect is thus an effect of hydrogen peroxide itself.

2.5 The antibacterial effect of the LP-system is, within certain limits, proportional to the thiocyanate concentration in the milk (provided that an equimolar amount of hydrogen peroxide is provided). The level thiocyanate in milk is related to the feeding of the animals and can thus vary. The practical use of the method consequently requires addition of some thiocyanate to ensure that a level necessary to achieve the desired effect, is present in the milk.

2.6 The levels of thiocyanate resulting from this treatment are within the physiological levels reported to occur in milk under certain circumstances and feeding regimes. They are also far below the thiocyanate levels known to exist in human saliva and certain common vegetables, e.g. cabbage and cauliflower. In addition, results from clinical experiments have clearly demonstrated that milk treated according to this method will not cause any interference of the iodine uptake of the thyroid gland, neither in persons with a normal iodine status nor in cases of iodine deficiency.

3. INTENDED UTILIZATION OF METHOD

3.1 This method should only be used in situations when technical, economical and/or practical reasons do not allow the use of cooling facilities for maintaining the quality of raw milk. Use of the LP-system in areas which currently lack an adequate infrastructure for collection of liquid milk, would ensure the production of milk as a safe and wholesome food, which otherwise would be virtually impossible.

3.2 The method should not be used by the individual farmers but at a suitable collecting point/centre. These centres must be equipped with proper facilities for cleaning and sanitising the vessels used to hold and transport milk.

3.3 The personnel responsible for the collection of milk should be in charge for the treatment of the milk. They should be given appropriate training, including training in general milk hygiene, to enable them fulfil this in a correct way.

3.4 The dairy processing the milk collected by use of the lactoperoxidase system should be made responsible for ensuring that the method is used as intended. This dairy should set up appropriate control methods (see Section 5) to monitor usage of the method, raw milk quality and quality of the milk prior to processing.

3.5 The method should primarily be used to prevent undue bacterial multiplication in raw milk during collection and transportation to the dairy processing plant under conditions stated in 3.1. The inhibitory effect of the treatment is dependent on the temperature of the stored milk and has been found to act for the following periods of time in laboratory and field-experiments carried out in different countries with raw milk of an initial good hygienic standard:

Temperature, °C	Time, h
30	7–8
25	11–12
20	16–17
15	24–26

3.6 The use of the lactoperoxidase method does not exclude the necessity of pasteurization of the milk before human consumption. Neither does it exclude the normal precautions and handling routines applied to ensure a high hygienic standard of the raw milk.

4. PRACTICAL APPLICATION OF THE METHOD

4.1 The lactoperoxidase system can be activated in raw milk to give the above stated antibacterial effect by an addition of thiocyanate as sodium thiocyanate and hydrogen peroxide in the form of sodium percarbonate by the following procedure:

- 14 mg of NaSCN is added per litre of milk. The milk should then be mixed to ensure an even distribution of the SCN-. Plunging for about 1 minute with a clean plunger is normally satisfactory.
- Secondly, 30 mg of sodium percarbonate is added per litre of milk. The milk is then stirred for another 2–3 minutes to ensure that the sodium percarbonate is completely dissolved and the hydrogen peroxide is evenly distributed in the milk.

4.2 It is essential that the sodium thiocyanate and sodium percarbonate are added in the order stated above. The enzymatic reaction is started in the milk when the hydrogen peroxide (sodium percarbonate) is added. It is completed within about 5 minutes from the addition of H_2O_2; thereafter, no hydrogen peroxide is present in the milk.

4.3 The activation of the lactoperoxidase system should be carried out within 2–3 hours from the time of milking.

4.4 Quantities of sodium thiocyanate and sodium percarbonate needed for the treatment of a certain volume of milk, for example 40 or 50 litre milk churns, should be distributed to the collecting centre/point in prepacked amounts lasting for a few weeks at a time. The technical specifications of the thiocyanate and sodium percarbonate which should be used are stated in Appendices I and II.

5. CONTROL OF USAGE

5.1 The use of the lactoperoxidase system for preserving raw milk must be controlled by the dairy processing plant receiving the milk. This should be a combination of currently used acceptance tests, e.g. titratable acidity, methylene blue, resazurin, total viable count and analyses of the thiocyanate concentration in the milk. Since the thiocyanate is not consumed in the reaction, treated milk arriving at the dairy plant would contain approximately 10 mg above the natural amount of thiocyanate (the latter can be determined by analysing untreated milk from the same area) per litre of milk. The analytical method for SCN^- is described in Appendix III Testing should be undertaken at random. If the concentration of thiocyanate is too high (or too low), investigation must be carried out to determine why the concentration is outside specification. The dairy processing plant should also be responsible for the control of the chemicals to be used at the collection centre for the activation of the lactoperoxidase system.

5.2 Analysis of the bacteriological quality of the milk (methylene blue, resazurin, total plate count) should also be carried out to ensure that good hygienic standards are not neglected. Since the effects of the system are predominantly bacteriostatic, an initial high bacterial population in the milk can still be revealed by such tests.

APPENDIX I

TECHNICAL SPECIFICATION OF SODIUM THIOCYANATE

Definition

Chemical name	Sodium thiocyanate
Chemical formula	NaSCN
Molecular weight	81.1
Assay content	98–99%
Humidity	1–2%

Purity (according to JECFA* specification)

Heavy metals (as Pb)	< 2 ppm
Sulphates (as SO_4)	< 50 ppm
Sulphide (S)	< 10 ppm

* Joint FAO/WHO Expert Committee on Food Additives.

APPENDIX II

TECHNICAL SPECIFICATION OF SODIUM PERCARBONATE

Definition

Chemical name	Sodium percarbonate (*)
Chemical formula	$2Na_2CO_3 \cdot 3H_2O_2$
Molecular weight	314.0
Assay content	85%

Commercial available sodium percarbonate recommended to be used has the following specification:

Sodium carbonate peroxyhydrate	> 85%
Heavy metals (as Pb)	< 10 ppm
Arsenic (as As)	< 3 ppm

* For information where sodium percarbonate could be obtained commercially, please apply to IDF General Secretariat, 41 Square Vergote, B-1040 Brussels, Belgium.

APPENDIX III

ANALYSIS OF THIOCYANATE IN MILK

Principle

Thiocyanate can be determined in milk, after deproteinisation, with trichloroacetic acid (TCA), as the ferric complex by measuring the absorbance at 460 nm. The minimum level of detection by this method is 1 to 2 ppm of SCN^- .

Reagent solutions

1. 20% (w/v) trichloroacetic acid: 20 g TCA is dissolved in 100 ml of distilled water and filtered
2. Ferric nitrate reagent: 16.0 g $Fe(NO_3)_3.9H_2O$ is dissolved in 50 ml 2 M HNO_3* and then diluted with distilled water to 100 ml. The solution should be stored dark and cold.

   * 2M HNO_3 is obtained by diluting 138.5 ml 65% HNO_3 to 1 000 ml with distilled water.

Determination

4.0 ml of milk is mixed with 2.0 ml of 20% TCA solution. The mixture is blended well and then allowed to stand for at least 30 minutes. It is thereafter filtered through a suitable filter paper (Whatman No. 40). 1.5 ml of the clear filtrate is then mixed with 1.5 ml of the ferric nitrate reagent and the absorbance measured at 460 nm. As a blank, a mixture of 1.5 ml of ferric nitrate solution and 1.5 ml of water is used. The measurement must be carried out within 10 minutes from the addition of the ferric nitrate solution as the coloured complex is not stable for any length of time. The concentration of thiocyanate is then determined by comparison with standard solutions of known thiocyanate concentration, e.g. 10, 15, 20 and 30 µg/ml of thiocyanate.

CODE OF HYGIENIC PRACTICE FOR MILK AND MILK PRODUCTS

CAC/RCP 57-2004

CODE OF HYGIENIC PRACTICE FOR MILK AND MILK PRODUCTS

CAC/RCP 57-2004

INTRODUCTION

Milk and milk products are a rich and convenient source of nutrients for people in many countries and international trade of milk-based commodities is significant. The purpose of this Code is to provide guidance to ensure the safety and suitability of milk and milk products to protect consumers' health and to facilitate trade. The Code satisfies the food hygiene provisions in the Codex Alimentarius *Procedural Manual* under "Relations Between Commodity Committees and General Committees" for use in the various dairy standards.

All foods have the potential to cause food borne illness, and milk and milk products are no exception. Dairy animals may carry human pathogens. Such pathogens present in milk may increase the risk of causing food borne illness. Moreover, the milking procedure, subsequent pooling and the storage of milk carry the risks of further contamination from man or the environment or growth of inherent pathogens. Further, the composition of many milk products makes them good media for the outgrowth of pathogenic micro-organisms. Potential also exists for the contamination of milk with residues of veterinary drugs, pesticides and other chemical contaminants. Therefore, implementing the proper hygienic control of milk and milk products throughout the food chain is essential to ensure the safety and suitability of these foods for their intended use. It is the purpose of this Code to provide guidance to countries so that their appropriate level of public health protection for milk and milk products may be achieved. It is also the purpose of this code to prevent unhygienic practices and conditions in the production, processing, and handling of milk and milk products, as in many countries milk and milk products form a large portion of the diet of consumers especially infants, children, and pregnant and lactating women. This document is formatted in accordance with the *Recommended International Code of Practice – General Principles of Food Hygiene*, CAC/RCP 1-1969. This Code presents principles for the hygienic production and manufacture of milk and milk products and guidance on their application. This Code takes into consideration, to the extent possible, the various production and processing procedures as well as the differing characteristics of milk from various milking animals used by member countries. It focuses on acceptable food safety outcomes achieved through the use of one or more validated food safety control measures, rather than mandating specific processes for individual products.

1. OBJECTIVES

The objective of this Code is to apply the recommendations of the *Recommended Code of Practice: General Principles of Food Hygiene* to the particular case of milk and milk products. It also provides guidance on how to achieve the general requirements contained in the hygiene sections of the Codex commodity standards for milk products.

2. SCOPE AND USE OF THE DOCUMENT

2.1 Scope

This Code applies to the production, processing and handling of milk and milk products as defined in the *General Standard for the Use of Dairy Terms*[1](CODEX STAN 206-1999). Where milk products are referred to in the code it is understood that this term also includes composite milk products. The scope of this Code does not extend to the production of raw drinking milk.

This Code applies to products in international trade. It may also serve as a basis for national legislation.

2.2 Use of the document

The provisions of this document are supplemental to and must be used in conjunction with, the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969.

This document consists of a series of principles, explanatory narratives and guidelines. Over-arching principles that are applicable to all phases of production, processing and handling of milk and milk products are given in Section 2.3.

Specific principles and their associated explanatory narratives and guidelines are given in the appropriate section.

Principles, shown in **bold text**, are a statement of the goal or objective that is to be achieved. *Explanatory narratives*, shown in *italicized text,* serve to explain the purpose of the stated principle. Guidelines for the application of the stated principle are shown in normal text.

The annexes are an integral part of this Code. They provide guidelines for different approaches to the application of the principles. The purpose of the guidelines contained in the annexes is to explain and illustrate how principles in the main body of this code may be met in practice. Thus, the *Recommended International Code of Practice – General Principles of Food Hygiene*, the main body of this Code and its annexes must be used together to obtain complete guidance on the hygienic production of milk and milk products.

[1] This code applies to the milk and milk products obtained from all milking animals.

2.3 Overarching principles applying to the production, processing and handling of all milk and milk products

The following overarching principles apply to the production, processing and handling of all milk and milk products.

- **From raw material production to the point of consumption, dairy products produced under this Code should be subject to a combination of control measures, and these control measures should be shown to achieve the appropriate level of public health protection.**

- **Good hygienic practices should be applied throughout the food chain so that milk and milk products are safe and suitable for their intended use.**
  No part of this Code should be used without consideration of what takes place in the chain of events prior to the particular measure being applied or what will take place subsequent to a particular step. The Code should only be used within the context of an understanding that there is a continuum of controls that are applied from production to consumption.

- **Wherever appropriate, hygienic practices for milk and milk products should be implemented within the context of HACCP as described in the Annex to the *Recommended International Code of Practice – General Principles of Food Hygiene.***
  This principle is presented with the recognition that there are limitations to the full application of HACCP principles at the primary production level. In the case where HACCP cannot be implemented at the farm level, good hygienic practices, good agricultural practices and good veterinary practices should be followed.

- **Control measures should be validated as effective.** The overall effectiveness of the system of control measures should be subject to validation. Control measures or combinations thereof should be validated according to the prevalence of hazards in the milk used, taking into consideration the characteristics of the individual hazards(s) of concern and established Food Safety Objectives and/or related objectives and criteria. Guidance on validating control measures should be obtained from the Codex *Guidelines for the Validation of Food Hygiene Control Measures* (under development).

2.4 Relative roles of milk producers, manufacturers, distributors, retailers, transporters, consumers, and competent authorities

Although the responsibility lies with the manufacturer for ensuring that the foods manufactured are safe and suitable, there is a continuum of effective effort or controls needed by other parties, including milk producers, to assure the safety and suitability of milk products. It is important to recognize that distributors, competent authorities and consumers also have a role in ensuring the safety and suitability of milk and milk products.

The interrelationship and impact of one segment of the food chain on another segment is important to ensure that potential gaps in the continuum are dealt with through communication and interaction between the milk producer, the manufacturer, the distributor and the retailer. While it is principally the responsibility of the manufacturer to conduct the hazard analysis within the context of developing a control system based on HACCP and thus to identify and control hazards associated with the incoming raw materials, the milk producer should also have an understanding of the hazards associated with milk, so as to assist in minimizing their presence in the raw material.

To achieve an effective continuum, the various parties should pay attention, in particular, to the following responsibilities.

- Producers should ensure that good agricultural, hygienic and animal husbandry practices are employed at the farm level. These practices should be adapted, as appropriate, to any specific safety-related needs specified and communicated by the manufacturer.
- Manufacturers should utilize good manufacturing and good hygienic practices, especially those presented in this Code. Any needs for additional measures with regard to controlling hazards during primary production should be effectively communicated to suppliers to enable the milk producer to adapt their operations to meet them. Likewise, the manufacturer may have to implement controls or adapt their manufacturing processes based on the ability of the milk producer to minimize or prevent hazards associated with the milk. Such additional needs should be supported by an adequate hazard analysis and should, where appropriate, take into consideration technological limitations during processing, and/or market demands.
- Distributors, transporters and retailers should assure that milk and milk products under their control are handled and stored properly and according to the manufacturer's instructions.
- Consumers should accept the responsibility of ensuring that milk and milk products in their possession are handled and stored properly and according to the manufacturer's instructions.
- In order to effectively implement this Code, competent authorities should have in place legislative framework (e.g., acts, regulations, guidelines and requirements), an adequate infrastructure and properly trained inspectors and personnel. For food import and export control systems, reference should be made to the *Codex Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems* (CAC/GL 26-1997). Control programmes should focus on auditing relevant documentation that shows that each participant along the chain has met their individual responsibilities to ensure that the end products meet established food safety objectives and/or related objectives and criteria.

It is important that clear communications and interactions exist between all parties to help assure good practices are employed, that problems are identified and resolved in an expeditious manner, and that the integrity of the entire food chain is maintained.

2.5 Definitions

Definitions contained in the *Codex General Standard for the Use of Dairy Terms* (CODEX STAN 206- 1999) are incorporated into this document by reference. Definitions relevant to a particular annex (e.g., heat treatment definitions) will be contained in the relevant annex.

Avoid – To keep away from, to the extent reasonably practicable. This term will be used when it is possible, in theory, to have no contamination or to constrain a particular practice.

Control measure – Any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.[2]

Food safety objective[3]

Minimize – To reduce the likelihood of occurrence or the consequence of an unavoidable situation such as microbiological growth.

Process criteria[4] – The process control parameters (e.g. time, temperature) applied at a processing step.

Raw milk – Milk (as defined in *Codex General Standard for the Use of Dairy Terms*) which has not been heated beyond 40ºC or undergone any treatment that has an equivalent effect.

Shelf life – The period during which the product maintains its microbiological safety and suitability at a specified storage temperature and, where appropriate, specified storage and handling conditions.

Validation[5]

2.6 Suitability

Food Suitability as defined in the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969 is: "Assurance that food is acceptable for human consumption according to its intended use".

For the purposes of this Code, Suitability includes:

- The concept of wholesomeness and soundness.
- Only matters relating to hygiene. Matters relating to grade, commercial quality or compliance to standards of identity are not included.

Additionally:

- Suitability of milk and milk products may be achieved by observing good hygienic practice as outlined in the *Recommended International Code of*

[2] For purposes of this Code, a control measure encompasses any action or activity used to eliminate a hazard or reduce it to an acceptable level. In addition the term refers to any action or activity taken to reduce the likelihood of the occurrence of a hazard in milk or milk products. Thus, control measures include both process controls such as heating, cooling, acidification, etc., as well as other activities such as general hygiene and pest control programmes, etc.

[3] *Codex Procedural Manual,* 14th Edition.

[4] This term is defined in *Guidelines for the Validation of Food Hygiene Control Measures* (under development by the Codex Committee on Food Hygiene).

[5] This term is defined in *Guidelines for the Validation of Food Hygiene Control Measures* (under development by the Codex Committee on Food Hygiene).

Practice – General Principles of Food Hygiene, CAC/RCP 1-1969 and specified in detail in this Code. The use of a management system based on HACCP principles is an effective way of ensuring suitability and demonstrating that suitability is achieved.

- Milk and milk products may not be suitable if the milk or milk product, for example:
  - Is damaged, deteriorated or perished to an extent that makes the milk or milk product unfit for its reasonable intended use; or
  - Contains any damaged, deteriorated or spoiled substance that makes the milk or milk product unfit for its reasonable intended use; or
  - Contains a biological or chemical agent, or other matter or substance, that is foreign to the nature of the food and that makes the milk or milk product unfit for its reasonable intended use.
- The "intended use" is the purpose for which the product is specifically stated or could reasonably be presumed to be intended having regard to its nature, packaging, presentation and identification.

3. PRIMARY PRODUCTION

These principles and guidelines supplement those contained in Section 3 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969 and the general principles presented in Section 2.3 above. Details on specific approaches to the production of milk are given in Annex I of this Code.

PRINCIPLES APPLYING TO THE PRIMARY PRODUCTION OF MILK

Milk should not contain any contaminant at a level that jeopardizes the appropriate level of public health protection, when presented to the consumer.

Because of the important influence of primary production activities on the safety of milk products, potential microbiological contamination from all sources should be minimized to the greatest extent practicable at this phase of production. It is recognized that microbiological hazards can be introduced both from the farm environment and from the milking animals themselves. Appropriate animal husbandry practices should be respected and care should be taken to assure that proper health of the milking animals is maintained. Further, lack of good agricultural, animal feeding and veterinary practices and inadequate general hygiene of milking personnel and equipment and inappropriate milking methods may lead to unacceptable levels of contamination with chemical residues and other contaminants during primary production.

Contamination of milk from animal and environmental sources during primary production should be minimized.

*Note: A contaminant is "any biological or chemical agent, foreign matter, or other substances not intentionally added to food which may compromise food safety or suitability" (*Recommended International Code of Practice – General Principles of Food Hygiene*).*

The microbial load of milk should be as low as achievable, using good milk production practices, taking into account the technological requirements for subsequent processing.
Measures should be implemented at the primary production level to reduce the initial load of pathogenic micro-organisms and micro-organisms affecting safety and suitability to the extent possible to provide for a greater margin of safety and/or to prepare the milk in a way that permits the application of microbiological control measures of lesser stringency than might otherwise be needed to assure product safety and suitability.

USE OF THIS SECTION

Guidelines for applying the principles in this section are contained in Annex I. The guidelines are intended to result in raw material that is acceptable for further processing and that will ultimately result in the level of protection required for the particular finished milk product.

Annex I provides details of the general approach that should be used for the primary production of milk intended for further processing of an unspecified nature. Additional provisions to be used in the production of milk intended for the manufacture raw milk products are identified in relevant sections of the annex. Flexibility in the application of certain aspects of the primary production of milk for small holder dairy farms is also provided for. Milk produced according to the provisions of this section should be subjected to the application of control measures described in Annex II.

3.1 Environmental hygiene

Water and other environmental factors should be managed in a way that minimizes the potential for the transmission, directly or indirectly, of hazards into the milk.
Contaminated water, and for example pests (such as insects and rodents), chemicals and the internal and external environments where the animals are housed and milked, may contaminate feed, equipment or milking animals leading to the introduction of hazards into milk.

Water used in primary production operations should be suitable for its intended purpose and should not contribute to the introduction of hazards in milk.

3.2 Hygienic production of milk

3.2.1 Areas and premises for milk production

Areas including premises used for the production of milk should be designed, situated, maintained and, to the extent practicable, used in a manner that minimizes the introduction of hazards into milk.
Improperly protected and maintained premises for the holding and milking of dairy animals have been shown to contribute to the contamination of milk.

3.2.2 Animal health

The health status of milking animals and herds should be managed in a manner that addresses the hazards of concern for human health.

Milk should come from animals in good health so that, considering the end use, it does not adversely affect the safety and suitability of the end product.

It is important to prevent the spread of zoonotic diseases among animals and from animals (including milking animals) to milk. Milk and milk products produced from milk obtained from certain diseased animals has been known to be neither safe nor suitable for human consumption.

Maintenance of healthy milking animals has been shown to reduce the likelihood that human pathogens will be introduced into the milk via the mammary gland or from the faeces.

3.2.3 General hygienic practice

3.2.3.1 Feeding

With consideration given to the end use of the milk, forage and feed for lactating animals should not introduce, directly or indirectly, contaminants into milk in amounts that present an unacceptable health risk to the consumer or adversely affect the suitability of milk or milk products.

It has been shown that improper procurement, manufacturing and handling of animal feed can result in the introduction of pathogens and spoilage organisms to milking animals and the introduction of chemical hazards such as pesticide residues, mycotoxins and of other contaminants which can affect the safety and suitability of milk or milk products.

3.2.3.2 Pest control

Pests should be controlled, and in a way that does not result in unacceptable levels of residues, such as pesticides, in the milk.

Pests such as insects and rodents are known vectors for the introduction of human and animal diseases into the production environment. Improper application of pest control chemicals used to control these pests may introduce chemical hazards into the production environment.

3.2.3.3 Veterinary drugs

Animals should only be treated with veterinary drugs authorized by the competent authority for the specific use and in a manner that will not adversely impact on the safety and suitability of the milk, including adherence to the withdrawal period specified.

Milk from animals that have been treated with veterinary drugs that can be transferred to milk should be discarded appropriately until the withdrawal period specified for the particular veterinary drug has been achieved.

Residues of veterinary drugs in milk should not exceed levels that would present an unacceptable risk to the consumer.

The improper use of veterinary drugs has been shown to result in potentially harmful residues in milk and milk products, and may affect the suitability of milk intended for the manufacture of cultured products.

3.2.4 Hygienic milking

Milking should be carried out in such a manner that minimizes contamination of the milk being produced.

Effective hygienic practice during milking is an important element of the system of controls necessary to produce safe and suitable milk and milk products. Failure to maintain adequate sanitation and employee practices has been shown to contribute to the contamination of milk with undesirable or pathogenic micro-organisms or chemical or physical hazards.

3.3 Handling, storage and transport of milk

With consideration given to the end use of the milk, handling, storage and transport of milk should be conducted in a manner that will avoid contamination and minimize any increase in the microbiological load of milk.

Proper handling, storage and transport of milk are important elements of the system of controls necessary to produce safe and suitable milk and milk products. Contact with unsanitary equipment and foreign materials are known causes of milk contamination. Temperature abuse is known to increase the microbiological load of milk.

3.3.1 Milking equipment

Milking equipment should be designed, constructed, installed, maintained and used in a manner that will avoid the introduction of contaminants into milk.

Milking equipment is normally designed and constructed according to recognized standards that avoid the introduction of contaminants into milk. Equipment selected for installation on dairy farms should meet recognized design and construction standards. Recognized guidelines also exist for the proper use, cleaning and maintenance of milking equipment; such guidelines should be followed to avoid transfer of disease between animals through milking equipment and to help ensure obtaining milk that is safe and suitable.

Milking equipment should be operated in a manner that will avoid damage to udder and teats and that will avoid the transfer of disease between animals through the milking equipment.

It is important to prevent any damage to udder and teats by milking equipment since such damage can lead to infections and consequently adversely affect the safety and suitability of milk and milk products.

3.3.2 Storage equipment

Milk storage tanks and cans should be designed, constructed, maintained and used in a manner that will avoid the introduction of contaminants into milk and minimize the growth of micro-organisms in milk.

3.3.3 Premises for, and storage of, milk and milking-related equipment

Premises for the storage of milk and milking-related equipment should be situated, designed, constructed, maintained and used in a manner that avoids the introduction of contaminants into milk.

Whenever milk is stored, it should be stored in a manner that avoids the introduction of contaminants into milk and in a manner that minimizes the growth of micro-organisms.

3.3.4 Collection, transport and delivery procedures and equipment

This section also covers the activities of personnel involved in the transport of milk.

Milk should be collected, transported and delivered without undue delay, and in a manner that avoids the introduction of contaminants into milk and minimizes the growth of micro-organisms in the milk.
Note: See Section 10 for provisions on the training of personnel involved in the collection, transport and delivery of milk.

Milk transport tankers and cans should be designed, constructed, maintained and used in a manner that will avoid the introduction of contaminants into milk and minimize the growth of micro-organisms in milk.

3.4 Documentation and record keeping

Records should be kept, as necessary, to enhance the ability to verify the effectiveness of the control systems.

4. ESTABLISHMENT: DESIGN AND FACILITIES

These principles and guidelines are supplemental to those contained in Section 4 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, Rev. 4, 2003 and to the general principles presented in Section 2.3 above.

4.1 Equipment

Equipment should be designed and installed such that as far as possible dead ends or dead spots in milk pipelines do not occur.
Where dead ends or dead spots occur, special procedures should ensure they are effectively cleaned or otherwise do not permit a safety hazard to occur.

5. CONTROL OF OPERATION

These principles and guidelines are supplemental to those contained in Section 5 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969 (including the Annex on *Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application)* and to the overarching principles presented in Section 2.3 above.

USE OF THIS SECTION

This section contains principles for the control of operation that are intended to be applied in such a manner as to result in meeting acceptable levels of relevant hazards specified as Food Safety Objectives and/or related objectives and criteria, or end product criteria that have been established to express the level of protection for the specific situation. Guidelines for applying the principles with respect to physical, chemical and microbiological hazards are provided in this section as well. Details given in Annex II provide guidance on the establishment and management of control measures used to achieve safety and suitability during and after processing.

For the effective implementation of the provisions in this Section, milk should be produced in accordance with Section 3 and Annex I of this Code.

5.1 Control of food hazards

The combination of control measures should effectively control the identified hazards in milk and milk products.

The combination of control measures should be designed in a systematic way, and the chosen combination should be adapted to the hygiene status of the milk and raw materials used with consideration given to the relevant microbiological, chemical and physical hazards of concern and to the establishment of Food Safety Objective(s) and/or related objectives and criteria.

Where appropriate control measures and/or control measure combinations are chosen to control hazards that are reasonably likely to occur, the procedures described in sections 5.1.1 to 5.1.3 and corresponding guidelines contained in Annex II should be implemented in order to minimize or prevent the likelihood of a health risk to the consumer.

The following procedures are intended to enhance and supplement those aspects of the HACCP Annex to the *International Recommended Code of Practice – General Principles of Food Hygiene,* which are critical to the successful design of a system of food safety controls.

5.1.1 Hazard identification and evaluation

All potential hazards should be identified.

This should be done before control measures are selected and is the first step in the hazard analysis.

The identification should be based on the initial descriptions developed during preliminary steps and on experience, external information, as well as epidemiological and other historical data that have been associated with the type of food under consideration, the type of raw materials and ingredients used, and that may be introduced during processing and distribution. To insure a comprehensive approach, the various step(s) in the manufacturing process, from material selection through processing and distribution, where a hazard may occur or be introduced should be identified.

Each potential hazard should be evaluated to determine the severity of its adverse health effects and reasonable likelihood of occurrence.
Potential hazards that are determined to have severe adverse health effects and/or are reasonably likely to occur should be subject to control by the system of control measures.

5.1.2 Control measure selection

Following hazard evaluation, control measures and control measure combinations should be selected that will prevent, eliminate, or reduce the hazards to acceptable levels.
The next step in the hazard analysis process is to select control measures that will be effective in controlling those hazards. A number of such control measures are further described in Annex II, Parts A and B.
Guidance on how to provide reference validations of individual control measures or control measure combinations against individual hazards in various media is given in *Guidelines for the Validation of Food Hygiene Control Measures* (CCFH document under development).

5.1.3 Establishment of process criteria

Process criteria for control measures should be established in order for the process to be applied in a manner that will meet the performance required, i.e., assure the adequate delivery of the control measure.
Process criteria should be established at such intensities that the control measures actually deliver the expected performance, taking into account normal process deviations.

5.2 Key aspects of hygiene control systems

5.2.1 Temperature and time controls

From milk production through to finished products, products should be stored at appropriate temperatures and for appropriate times such that the growth or development of a food safety hazard will be minimized and the product's suitability will not be adversely affected.
Because milk and many milk products have a sufficient moisture content to support the growth of pathogens, temperature and time controls represent key microbiological control measures to control growth throughout the manufacturing process, from the handling of milk to the distribution and storage of perishable milk products (e.g., pasteurized drinking milk, desserts, and soft cheeses, depending on shelf life). For instance, for liquid milk, increased storage temperature will decrease the shelf life.

5.2.1.1 Management of products within the plant

Incoming milk
When arriving at the dairy plant, and provided that further processing does not allow otherwise, the milk should be cooled and maintained at such temperatures as necessary to minimize any increase of the microbial load of the milk.

The principle of "first arrived, first processed" should apply.

Intermediate products

Intermediate products that are stored prior to further processing should, unless further processing does not allow it, be kept under such conditions that limit/prevent microbial growth or be further processed within a short time period.

The ultimate safety and suitability of milk and milk products, as well as the intensity of the control measures that need to be applied during processing, depends not only on the initial microbial load upon receipt at the dairy plant but also on preventing the growth of micro-organisms. Application of proper storage temperatures and management of raw materials is an essential factor in minimizing microbial growth. The ability of a product to meet intended Food Safety Objectives and/or related objectives and criteria is dependent upon the proper application of the control measures, including time and temperature controls.

There should be adequate stock rotation, based on the principle of "first in, first out".

5.2.1.2 Distribution of finished products

It is essential that milk and milk products be kept at an appropriate temperature in order to maintain their safety and suitability from the time it is packaged until it is consumed or prepared for consumption.

While the storage temperature should be sufficient to maintain the product's safety and suitability throughout the intended shelf life, the appropriate storage temperature will vary depending upon whether the product is perishable or non-perishable. For perishable products, the distribution system should be designed to maintain adequate low-temperature storage to ensure both safety and suitability. For non-perishable products designed to be shelf-stable at ambient temperature, extremes of temperature should be avoided, primarily to assure maintaining suitability. Reasonably anticipated temperature abuse should be taken into account in designing the normal patterns of distribution and handling.

5.2.1.3 Establishment of shelf life

It is the responsibility of the manufacturer to determine the shelf life of the product and the conditions for storage.

Limitation of shelf life is a control measure that, in many cases, is decisive for the safety and suitability of the product. The corresponding storage conditions are an integral aspect of product shelf life.

5.2.2 Specific process steps

Annex II, Appendices A and B contain examples of processes used during the manufacture of milk products that can control hazards that are reasonably likely to occur. These processes include both extrinsic and intrinsic factors that influence the growth of micro-organisms.

Extrinsic factors *refer to factors impacting the product from the environment in which the food is placed. Examples include temperature, time, and relative humidity of the air.*

Intrinsic factors *refer to internal factors in the product itself (food matrix), influenced by or as consequence of extrinsic factors, that have an impact on the growth and/or survival of micro-organisms. Examples include water activity, pH, nutrient availability, competition of micro-organisms, and bacteriocins or other growth inhibitors.*

5.2.3 Microbiological and other specifications

Where they are employed, microbiological criteria, including those used to verify the effective application of control measures within the framework of HACCP principles, should be developed in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods*, CAC/GL 21-1997, including the use of a risk assessment approach as specified in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment,* CAC/GL 030-1999.

5.2.3.1 Incoming milk

Manufacturers should establish incoming milk criteria that take into account the end use of the milk and the conditions under which the milk was produced.

Depending upon the end use of the milk, particularly for milk used in the production of raw milk products, certain specific microbiological criteria may be appropriate to verify the microbiological quality of the milk used as raw material.

Corrective action taken for non-compliance with incoming milk criteria should be commensurate with the potential risks presented by the non-compliance.

Incoming milk that is out of compliance with established criteria indicates that the control measure system is not working properly and corrective action should be taken to identify and resolve causative problems.

5.2.3.2 Microbiological criteria

Microbiological criteria may be necessary to be established at different points in the process for carrying out the design of control measure combinations and for the verification that the control system has been implemented correctly.

In some cases, for example where more comprehensive control measures are put into place to ensure the safety and suitability of milk (such as may be the case for raw milk intended to be used in the production of raw milk products), it may be necessary to establish criteria for in-process product, intermediate product or finished product in order to verify that the more comprehensive set of control measures have been properly carried out.

5.2.4 Microbiological cross contamination

The flow of the product and of the ingredients within equipment and through the processing facility should maintain a forward progression from raw material receipt to finished product packaging so as to avoid cross contamination.

The flow of the water, air, effluents, and milk should be carefully evaluated to ensure that the potential for cross-contamination does not occur. Similarly, the flow of personnel should be evaluated to ensure that their actions couldn't contaminate milk.

There should be adequate separation of areas with different levels of contamination risk.
Milk products that have been returned from other locations should be identified, segregated and stored in a clearly designated area.

Where there is the potential for cross-contamination between end products and raw materials or intermediate products, and from contaminated areas such as construction and rebuilding areas, consideration should be given to a physical separation, such as by the application of barrier hygiene (the application of physical or mechanical barriers to prevent or minimize the transfer of contaminants or potential sources of contaminants) and wet/dry area segregation.

5.2.5 Physical and chemical contamination

Preventive measures should be implemented to minimize risks of contaminating milk and milk products with physical and chemical hazards and foreign substances.
Avoiding physical and chemical contamination of milk and milk products during processing requires the effective control of equipment maintenance, sanitation programmes, personnel, monitoring of ingredients and processing operations.
Preventive measures should include those that will minimize the potential for cross contamination of allergenic components and/or ingredients that may present in other products to a milk product in which these components and/or ingredients are not supposed to be present.

5.3 Incoming material (other than milk) requirements

Ingredients used for the processing of milk products should be purchased according to specifications, and their compliance with these specifications should be verified.
Contaminated ingredients have been known to lead to unsafe/unsuitable milk products, since these ingredients are often added during processing where no further control measures are applied.
Preferably, specifications for raw materials should be established such that their use will result in a safe and suitable product. No raw material should be accepted if it is known to contain chemical, physical or microbiological contaminants that would not be reduced to an acceptable level by normal sorting and/or processing. Raw materials should, where appropriate, be inspected and sorted before processing. Any claims that raw materials meet safety and suitability specifications should be verified periodically.

5.4 Water

Dairy processing establishments should have potable water available, which prior to its first use, should meet the criteria specified by the competent authorities having jurisdiction and should be regularly monitored.

Water recirculated for reuse should be treated and maintained in such a condition that no risk to the safety and suitability of food results from its use.
Proper maintenance of water conditioning systems is critical to avoid the systems becoming sources of contamination. For example, filter systems can become sources of

bacteria and their metabolites if bacteria are allowed to grow on the organic materials that have accumulated on the filter.

Appropriate safety and suitability criteria that meet the intended outcomes should be established for any water used in dairy processing.
These criteria depend upon the origin and the intended use of the water. For example, reuse water intended for incorporation into a food product should at least meet the microbiological specifications for potable water.

Reconditioning of water for reuse and use of reclaimed, recirculated and recycled water should be managed in accordance with HACCP principles.
Any reuse of water should be subject to a hazard analysis including assessment of whether it is appropriate for reconditioning. Critical control point(s) should be identified, as appropriate, and critical limit(s) established and monitored to verify compliance.

6. ESTABLISHMENT: MAINTENANCE AND SANITATION

These principles and guidelines are supplemental to those contained in Section 6 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, Rev. 4, 2003.

6.1 Maintenance and cleaning

Processing areas should be kept as dry as possible.
Use of dry cleaning methods, and limiting the use of water in processing areas, helps to avoid the spread of contamination by water. Wet cleaning (other than Cleaning-in-Place) has been known to lead to milk product contamination due to the production of aerosols.

All food product contact surfaces in piping and equipment, including areas that are difficult to clean such as by-pass valves, sampling valves, and overflow siphons in fillers should be adequately cleaned.

6.2 Cleaning programmes

A routine programme to verify the adequacy of cleaning should be in place.
All equipment and utensils used in processing should, as necessary, be cleaned and disinfected, rinsed with water which is safe and suitable for its intended purpose (unless the manufacturer's instructions indicate rinsing is not necessary), then drained and air dried where appropriate.

7. ESTABLISHMENT: PERSONAL HYGIENE

No specific requirements beyond those contained in the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969 are needed.

8. TRANSPORTATION

These principles and guidelines are supplemental to those set forth in Section 8 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969 and, as appropriate, those set forth in *Code of Hygienic Practice for the Transport of Foodstuffs in Bulk and Semi-Packed Foodstuffs*. (CAC/RCP 47 – 2001).

8.1 Requirements

Products covered under this Code should be transported at time/temperature combinations that will not adversely affect the safety and suitability of the product.

8.2 Use and maintenance

In the case of refrigerated products, the vehicle product compartment should be cooled prior to loading and the product compartment should be kept at an appropriate temperature at all times, including during unloading.

9. PRODUCT INFORMATION AND CONSUMER AWARENESS

These principles and guidelines are supplemental to those contained in Section 9 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, Rev. 4, 2003.

9.1 Labelling

Milk products should be labelled in accordance with the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1; 1985 (Rev. 1-1991)), the Codex *General Standard for the Use of Dairy Terms* (CODEX STAN 206; 1999) and the relevant labelling section of Codex commodity standards for individual milk products.
Unless the product is shelf stable at ambient temperatures, a statement regarding the need for refrigeration or freezing should be included on the label of the product.

Additional provision for raw milk products

Raw milk products should be labelled to indicate they are made from raw milk according to national requirements in the country of retail sale.

10. TRAINING

These principles and guidelines are supplemental to those contained in Section 10 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, Rev. 4, 2003.

10.1 Training programmes

Milk producers and personnel involved in the collection and transport and retail of milk should be trained as necessary and have appropriate skills in the areas listed below:

- health of animals and use of veterinary drugs;

- manufacturing and use of feeds (more specifically fermented feeds);
- herd management;
- hygienic milking;
- storage, handling, collection and transport of milk (cleaning of storage tanks, temperature requirements, sampling procedures, etc.);
- microbiological, chemical and physical hazards and their control measures.

ANNEX I

GUIDELINES FOR THE PRIMARY PRODUCTION OF MILK

INTRODUCTION AND OBJECTIVES

The detailed information contained in this annex should be implemented in order to reduce the likelihood of milk contamination through inadequate primary production practices. This information will enable the implementation of the principles laid down in Section 3 of the main body of the Code by providing guidelines for their application.

These measures, in combination with microbiological control measures found in Annex II, should be used to effectively control the microbiological hazards in milk products. There is a close relationship between the hygienic conditions found in primary production and the safety and suitability of processed milk products based on the control measures presented in Annex II.

SCOPE

This Annex provides details of the approaches that should be used for the primary production of milk intended for further processing of an unspecified nature. The milk should be subjected to the application of microbiological control measures described in Annex II.

The degree to which on-farm practices control the likelihood of occurrence of food safety hazard in milk will have an impact on the nature of controls needed during the subsequent processing of the milk. Under normal circumstances, milk will be subjected to control measures sufficient to address any hazards that may be present. Where the subsequent processing of milk does not involve the application of control measures necessary to address any hazards that may be present, the focus then becomes preventative in nature in order to reduce the likelihood that such hazards will occur during the primary production phase of the continuum. Likewise, in certain primary production situations, the occurrence of food safety hazards may be less avoidable, which will mandate the application of more stringent control measures during subsequent processing in order to insure the safety and suitability of the finished product.

USE OF ANNEX I

The information in Annex I is organized to correspond with the relevant sections in the main part of the Code and the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, Rev. 4, 2003. Where a particular principle has been identified in the main body of the Code, guidelines for the application of that principle will be located in the corresponding section of this Annex.

Additional provisions for the production of milk used for raw milk products

When milk is intended to be used for the manufacture of raw milk products, the hygienic conditions used at the primary production are one of the most important public health control measures, as a high level of hygiene of the milk is essential in order to obtain milk with a sufficiently low initial microbial load in order to enable the manufacturing of raw milk products that are safe and suitable for human consumption. In such situations, additional control measures may be necessary. Where applicable, these additional measures are provided at the end of each sub-section.

Compliance with these additional hygienic provisions is important, and is considered mandatory in certain circumstances (where the nature of the finished product or national legislation requires), throughout the milk production process, up to the manufacture of the particular raw milk product. In addition, increased emphasis in certain aspects of the production of milk for raw milk products (animal health, animal feeding, milk hygiene monitoring) are specified and are critical to the production of milk that is safe and suitable for the intended purpose. To reflect the greater emphasis on the compliance needed on certain provisions, the word "should" has been substituted with the word "shall" where applicable.

As is the case with the rest of this code, this section also does not mandate or specify the use of any one set of controls to be used, but leaves it up to those responsible for assuring the safety of the finished product to choose the most appropriate set of control measures for the particular situation.

There are a wide variety of raw milk products, most of which are cultured products such as cheeses. The range of moisture content, pH and salt content (among other parameters) in these products will have varying degrees of impact on any potential microbiological hazards that may be present in the milk used for their manufacture. The degree to which the inherent characteristics of the product (or process used to manufacture the product) will control the hazard should guide the extent to which these potential hazards need to be prevented or controlled during primary production.

A wide range of food safety approaches exist for the production of raw milk products. As is the case with the rest of this code, the approach taken in this section is intended to be flexible enough to take into account the different approaches used in different countries regarding the manufacture and marketing of raw milk products.

Special provisions for the production of milk on small holder dairy farms

In the context of this Code, the expression "Small Holder Dairy Farm" refers to farms where the number of animals per farmer or per herd usually does not exceed 10, milking machines are not generally used, milk is not chilled at the producer's level and/or the milk is transported in cans.

Flexibility in the application of certain requirements of the primary production of milk in small holder dairy farms can be exercised, where necessary, provided that the milk is received by dairy plants and will be subjected to a combination of microbiological

control measures sufficient to obtain a safe and suitable milk product. Such flexibility is indicated throughout this annex by the use of a parenthetical statement "if used" or "if applicable" placed next to the particular provision where the flexibility is needed.

Flexibility as above may also apply to farms with larger number of animals but having similar economic constraints or limited water and/or power supplies, preventing investment in technological facilities and infrastructure.

3. PRIMARY PRODUCTION

3.1 Environmental hygiene

When water is used for the cleaning of the udder and for cleaning equipment used for the milking and storage of milk it should be of such quality that it does not adversely affect the safety and suitability of the milk.

Precautions should be adopted to ensure that milking animals do not consume or have access to contaminated water or other environmental contaminants likely to cause diseases transmissible to humans or contaminate milk.

3.2 Hygienic production of milk

3.2.1 Areas and premises for milk production

3.2.1.1 Animal holding areas

- The design, layout and provision of holding areas should not adversely affect the health of animals. In particular, holding areas should be kept clean and maintained in a manner that minimizes the risk of animal infection or contamination of the milk.
- Access to the animal holding area, including the stable and attached premises, if used, should preclude the presence of other species that would adversely affect the safety of the milk.
- The holding area should, as far as practicable, be kept clean and free of accumulations of manure, mud or any other objectionable materials.
- If used, stable and stalls should be designed and constructed to keep them free of accumulations of manure, feed residues, etc.
- Animal holding areas should be designed such that animals with contagious diseases can be separated to prevent the transmission of disease to healthy animals.
- Animal holding areas should not adversely affect the health of animals. In particular, the litter and the stabling area should be maintained in a manner that minimizes the risk of teat injuries and udder diseases.

3.2.1.2 Milking areas and related facilities

- Premises where milking is performed should be situated, constructed (if applicable) and maintained in a manner that will minimize or prevent contamination of the milk.

- Milking areas should be kept free of undesirable animals such as pigs, poultry and other animals whose presence may result in the contamination of milk.
- Premises where milking is performed should be easy to clean, especially in areas subject to soiling or infection, e.g., they should have:
  - flooring constructed to facilitate draining of liquids and adequate means of disposing of waste;
  - adequate ventilation and lighting;
  - an appropriate and adequate supply of water of a suitable quality for use when milking and in cleaning the udder of the animals and equipment used for milking;
  - effective separation from all sources of contamination such as lavatories (if used) and manure heaps; and
  - effective protection against vermin.

Additional provisions for the production of milk used for raw milk products

Only potable water can be used in milking areas, product storage areas and other critical areas.

3.2.2 Animal health

Adequate management measures should be implemented to prevent animal diseases and to control drug treatment of diseased animals or herds in an appropriate way. In particular, preventive measures should be taken to prevent disease including:

- Eradication of animal diseases or control of risk of transmission of the diseases, according to the specific zoonosis
- Management of other animals in the herd and other farmed animals present (including the segregation of diseased animals from healthy animals)
- Management of new animals in the herd

The milk should originate from herds or animals that are officially free of brucellosis and tuberculosis, as defined by the *OIE International Animal Health Code*. If not officially free, then milk should originate from herds or animals that are under official control and eradication programmes for brucellosis and tuberculosis. If controls for brucellosis and tuberculosis were not sufficiently implemented, it would be necessary for the milk to be subjected to subsequent microbiological control measures (e.g., heat treatment) that will assure the safety and suitability of the finished product.

Milk should be drawn from animals that:

- are identifiable to facilitate effective herd management practices;
- do not show visible impairment of the general state of health; and
- do not show any evidence of infectious diseases transferable to humans through milk including but not limited to diseases governed by the *OIE International Animal Health Code*.

Adequate measures should be implemented in order to prevent udder infections, especially:

- the correct use of milking equipment (e.g. daily cleaning, disinfection and disassembling of equipment);
- the hygiene of milking (e.g. udder cleaning or disinfection procedures);
- the management of the animal holding areas (e.g. cleaning procedures, design and size of areas);
- the management of dry and lactation periods (e.g., treatment for the drying off).

Additional provisions for the production of milk used for raw milk products

The milk cannot carry unacceptable levels of zoonotic agents. Therefore, the milk shall originate from individual animals:

- that are identifiable such that the health status of each animal can be followed. To this effect:
  - the herd shall be declared to the competent authorities and registered;
  - each animal shall be identified with a steadfast device and registered by the competent authorities.
- that do not show visible impairment of the general state of health and which are not suffering from any infection of the genital tract with discharge, enteritis with diarrhoea and fever, or recognizable inflammation of the udder;
- that do not show any evidence (signs or analytical results) of infectious diseases caused by human pathogens (e.g., Listeriosis) that are transferable to humans through milk including but not limited to such diseases governed by the *OIE International Animal Health Code*;
- that, in relation to brucellosis and tuberculosis, shall comply with the following criteria:
  - cows milk shall be obtained from animals belonging to herds that are officially free of tuberculosis and brucellosis in accordance with the relevant chapters of the OIE International Animal Health Code;
  - sheep or goat milk shall be obtained from animals belonging to sheep or goat herds that are officially free or free of brucellosis as per the OIE International Animal Health Code;
  - when a farm has a herd comprised of more than one species, each species shall comply with sanitary conditions that are mandatory for each particular species ;
  - if goats are in the same environment with cows, goats shall be monitored for tuberculosis.

In addition, it is necessary that the milk also be checked for other relevant aspects in accordance with point 5.2.3.1. (microbiological and other specifications) which can have an impact on the safety and suitability of raw milk products; these results may provide information regarding the health status of the animals.

In particular, preventive measures are needed to prevent disease including:

- animals of unknown health status shall be separated, before being introduced in the herd, until such time that their health status has been established. During that separation period, milk from those animals shall not be used for the production of milk for the manufacture of raw milk products;
- the owner shall keep a record of relevant information, e.g., results of tests carried out to establish the status of an animal just being introduced, and the identity for each animal either coming or leaving the herd.

3.2.3 General hygienic practice

3.2.3.1 Feeding

The relevant aspects of the Codex *Code of Practice on Good Animal Feeding* (under development) should be applied to minimize or prevent the introduction of contaminants through feed or feeding practices.

Additional provisions for the production of milk used for raw milk products

When using fermented feed, it is necessary that the feed be prepared, stored and used in a manner that will minimize microbial contamination. Particular attention shall be given to compliance with good practices concerning the following aspects:

- the design of silos;
- good production practices of silage;
- regular check of the quality of the fermented feed (organoleptic inspection or pH).

The owner shall keep a record of relevant information concerning feed.

3.2.3.2 Pest control

- Before pesticides or rodenticides are used, all efforts should be made to minimize the presence of insects, rats and mice. Although stables and milking parlours (if used) attract such pests, good preventive measures such as proper building construction and maintenance (if applicable), cleaning, and removal of faecal waste can minimize pests.
- Accumulations of manure should not be allowed to develop close to milking areas.
- Mice and rats are also attracted to animal feed stores. Hence, any such feed stores should be located at a suitable place and feed kept in containers that provide adequate protection against such pests.
- If it is necessary to resort to chemical pest control measures, such products should be approved officially for use in food premises and used in accordance with the manufacturer's instructions.
- Any pest control chemicals should be stored in a manner that will not contaminate the milking environment. Such chemicals should not be stored in wet areas or close to feed stores. It is preferable to use solid baits, wherever possible.
- No pesticides should be applied during milking.

3.2.3.3 Veterinary drugs[6]

- The relevant aspects of the *Guidelines on the Control of Veterinary Drug Residues in Milk and Milk Products* (under development) should be applied to minimize or prevent the introduction of drug residues in milk or milk products.
- Good husbandry procedures should be used to reduce the likelihood of animal disease and thus reduce the use of veterinary drugs.
- Only those medicinal products and medicinal premixes that have been authorized by competent authority for inclusion in animal feed should be used.
- Milk from animals that have been treated with veterinary drugs that can be transferred to milk should be discarded until the withdrawal period specified for the particular veterinary drug has been achieved. Established MRLs for residues of veterinary drugs in milk may serve as a reference for such verification.
- The veterinarian and/or the livestock owner or the collection centre should keep a record of the products used, including the quantity, the date of administration and the identity of animals. Appropriate sampling schemes and testing protocols should be used to verify the effectiveness of on-farm controls of veterinary drug use and in meeting established MRLs.

3.2.4 Hygienic milking

Minimizing contamination during milking requires that effective hygienic practices be applied in respect of the skin of the animal, the milking equipment (whenever used), the handler and the general environment e.g. faecal sources of contamination.

Milking should be carried out under hygienic conditions, including:

- good personal hygiene of the milking personnel;
- clean udders, teats, groins, flanks and abdomens of the animal;
- clean and disinfected milking vessels/equipment; and
- avoidance of any damage to the tissue of the teat/udder.

In particular, during any milking, consideration should be given to minimizing and/or preventing contamination from the milk production environment and maintaining personal hygiene.

Animals showing clinical symptoms of disease should be segregated and/or milked last, or milked by using separate milking equipment or by hand, and such milk should not be used for human consumption.

Operations such as feeding the animals or placement/removal of litter should be avoided prior to milking in order to reduce the likelihood of contamination of the milking equipment and the milking environment from manure or dust.

[6] Treatment with veterinary drugs should be consistent with the *Code of Practice to Minimize and Contain Antimicrobial Resistance* (under development by the Codex Committee on Residues of Veterinary Drugs in Foods).

The milking animals should be maintained in an as clean state as possible. Prior to any milking, teats should be clean. The milker should monitor by appropriate means that the milk appears normal, for example by careful observation of the condition of milking animals, by checking the milk of each animal for organoleptic or physicochemical indicators, and by using records and identification of treated animals. If the milk does not appear normal, the milk should not be used for human consumption. The producer should take appropriate precautions to minimize the risk of infections to teats and udders, including the avoidance of damage to tissue. Foremilk (initially drawn small quantity of milk) from each teat should be discarded or collected separately and not used for human consumption unless it can be shown that it does not affect the safety and suitability of the milk.

3.2.4.1 Environmental contamination

Milking operations should minimize the introduction of food-borne pathogens and foreign matter from the skin and general milking environment as well as chemical residues from cleaning and disinfection routines.

3.2.4.2 Milking equipment design

- Milking equipment, utensils and storage tanks should be designed, constructed and maintained in such a way that they can be adequately cleaned and do not constitute a significant source of contamination of milk.
- Milking equipment should be designed such that it does not damage teats and udders during normal operation.

3.2.4.3 Milking equipment cleaning and disinfection

- Milking equipment and storage tanks (and other vessels) should be thoroughly cleaned and disinfected following each milking, and dried when appropriate.
- Rinsing of equipment and storage tanks following cleaning and disinfection should remove all detergents and disinfectants, except in those circumstances where the manufacturer instructions indicate that rinsing is not required.
- Water used for cleaning and rinsing should be appropriate for the purpose, such that it will not result in contamination of the milk.

Additional provisions for the production of milk used for raw milk products

- Only potable water can be used in contact with milking equipment and other milk contact surfaces.

3.2.4.4 Health and personal hygiene of milking personnel

- Milking personnel should be in good health. Individuals known, or suspected to be suffering from, or to be a carrier of, a disease likely to be transmitted to the milk, should not enter milk handling areas if there is a likelihood of their contaminating the milk. Medical examination of a milk handler should be carried out if clinically or epidemiologically indicated.
- Hands and forearms (up to elbow) should be washed frequently and always washed before initiating milking or handling of milk.

- Milking should not be performed by persons having exposed abrasions or cuts on their hands or forearms. Any injury on hands or forearms must be covered with a water-resistant bandage.
- Suitable clothing should be worn during milking and should be clean at the commencement of each milking period.

3.3 Handling, storage and transport of milk

Time and temperature control is important during storage and transport of milk and depends highly on the type and effectiveness of the control measures applied during and after processing. Therefore, the needs for time/temperature control at farm level should be clearly communicated by the manufacturer of the milk products.

3.3.1 Milking equipment

The design of milking equipment, where used, and cans, should ensure there are no crevices or recesses that can interfere with proper cleaning.

Milking equipment should be installed and tested (if applicable) in accordance with manufacturer's instructions and in accordance with any available technical standards that have been established by appropriate technical standards setting organizations for such equipment (e.g., IDF, ISO, 3A) in order to assist in assuring that the equipment is functioning properly.

Milking equipment and cans should be cleaned and disinfected regularly and with sufficient frequency to minimize or prevent contamination of milk.

There should be a periodic verification process to ensure that milking equipment is in good working condition.

Milking equipment and utensils which are intended to come into contact with milk (e.g., containers, tanks, etc.) should be easy to clean and disinfect, corrosion resistant and not capable of transferring substances to milk in such quantities as to present a health risk to the consumer.

Between inspections, milking equipment should be maintained in proper working condition.

3.3.2 Milk storage equipment

Milk storage tanks and cans should be so designed to ensure complete drainage and constructed to avoid contamination of the milk when it is stored.

Milk storage equipment should be properly installed, maintained and tested in accordance with manufacturer's instructions and in accordance with any available technical standards that have been established by appropriate technical standards setting organizations for such equipment (e.g., IDF, ISO, 3A) in order to assist in assuring that the equipment is functioning properly.

Surfaces of milk storage tanks, cans and associated equipment intended to come into contact with milk should be easy to clean and disinfect, corrosion resistant and not capable of transferring substances to milk in quantities that will present a health risk to the consumer.

Milk tanks and cans should not be used to store any harmful substance that may subsequently contaminate milk. If milk storage tanks and cans are used to store foods other than milk, precautions should be taken to prevent any subsequent milk contamination.

Storage tanks and cans should be cleaned and disinfected regularly and with sufficient frequency to minimize or prevent contamination of milk.

Storage tanks or portions of storage tanks that are outdoors should be adequately protected or designed such that they prevent access of insects, rodents and dust in order to prevent contamination of milk.

There should be a periodic verification process to ensure that milk storage equipment is properly maintained and in good working condition.

Additional provisions for the production of milk used for raw milk products

Milk tanks and cans can be used only to store milk and milk products.

It is necessary to verify, at least once a year, that milk storage equipment is maintained and in good working order.

3.3.3 Premises for, and storage of, milk and milking-related equipment

Premises for the storage of milk should be situated and constructed to avoid risk of contamination of milk or equipment.

Premises for the storage of milk should have:

- suitable milk refrigeration equipment, when appropriate;
- a sufficient supply of water of a suitable quality of for use in milking and in cleaning of equipment and instruments;
- protection against vermin;
- easily cleanable floors, if applicable; and
- adequate separation between milking areas and any premises where animals are housed in order to prevent contamination of milk by animals. Where separation is not possible, adequate measures should be taken to ensure that the milk is not contaminated.

Immediately after milking, the milk should be stored in properly designed and maintained tanks or cans in a clean place.

Storage temperatures and times should be such that minimizes any detrimental effect on the safety and suitability of milk. The time and temperature conditions for milk storage at the farm should be established taking into account the effectiveness of the control system in place during and after processing, the hygienic condition of the milk and the intended duration of storage. In situations where the milk cannot be chilled on the farm, collection and delivery of this milk to a collection centre or processing facility within certain time limits may be required. These conditions may be specified in legislation, in Codes of Practice, or by the manufacturer receiving the milk in collaboration with the milk producer and the competent authority.

Additional provisions for the production of milk used for raw milk products

When milk for further processing is not collected or used within 2 hours after milking, it shall be cooled:

- to a temperature equal to or below 6°C when collected on a daily basis; or
- to a temperature equal to or below 4°C when not collected every day.

Deviations from those temperatures may be acceptable if those deviations will not result in an increased risk of microbiological hazards, have been approved by the manufacturer receiving the milk, have been approved by the competent authority, and the end product will still meet the microbiological criteria established in accordance with 5.2.3.2.

3.3.4 Collection, transport and delivery procedures and equipment

3.3.4.1 Collection, transport and delivery procedures

- Personnel and vehicular access to the place of collection should be adequate for the suitable hygienic handling of milk. In particular, access to the place of collection should be clear of manure, silage, etc.
- Prior to collection, the milk hauler or collection/chilling centre operator should check the individual producer's milk to ensure that the milk does not present obvious indications of spoilage and deterioration. If the milk shows indications of spoilage and deterioration, it should not be collected.
- Collection and chilling centres, if employed, should be designed and operated in such a manner that minimizes or prevents the contamination of milk.
- Milk should be collected under hygienic conditions to avoid contamination of milk. In particular, the milk hauler or collection centre operator should, where appropriate, take samples in such a way to avoid contamination of the milk and should ensure that the milk has the adequate storage/in-take temperature prior to collection.
- The milk hauler should receive adequate training in the hygienic handling of raw milk.
- Milk haulers should wear clean clothing.
- Milk hauling operations should not be performed by persons at risk of transferring pathogens to milk. Appropriate medical follow-up should be done in the case of an infected worker.

- Milk haulers should perform their duties in a hygienic manner so that their activities will not result in contamination of milk.
- The driver should not enter the stables or other places where animals are kept, or places where there is manure.
- Should driver clothing and footwear be contaminated with manure, the soiled clothes and footwear should be changed or cleaned before work is continued.
- The tanker driver should not enter the processing areas of the dairy plant. Conditions should be arranged to allow necessary communication with the staff of the dairy, delivery of milk samples, dressing, rest breaks, etc. without direct contact taking place with the dairy processing areas or with staff members involved with processing milk and milk products.

Additional provisions for the production of milk used for raw milk products

- Milk to be used for the manufacture of raw milk products shall be collected separately. Mixing, or cross-contamination with milk which does not comply with the quality (including microbiological) expected for the processing of raw milk products shall not be allowed.
  For example:
  - organize collection pick-ups in such a way that milk for the manufacture of raw milk products be collected separately; or
  - use milk transport tankers with compartments that will allow the separation of the milk for raw milk products from milk to be heat processed combined with the pick-up of milk for raw-milk products before milk for other products.

3.3.4.2 Collection, transport and delivery equipment

- Guidance on the bulk transport of foods is given in the *Code of Hygienic Practice for the Transport of Food in Bulk and Semi-Packed Food* (CAC/RCP 47-2001).
- Milk transport tankers and cans should be designed and constructed such that they can be effectively cleaned and disinfected.
- Milk transport tankers and cans should be designed and constructed to ensure complete drainage.
- Milk transport tankers and cans should not be used to transport any harmful substance. If milk transport tanks and cans are used to transport foods other than milk, precautions such as the implementation of adequate cleaning protocols should be taken to prevent any subsequent milk contamination.
- Surfaces of milk transport tankers, cans and associated equipment intended to come into contact with milk should be easy to clean and disinfect, corrosion resistant and not capable of transferring substances to the milk in such quantities as to present a health risk to the consumer.
- Milk cans and transport tankers (including the milk discharge area, valves, etc.) should be cleaned and disinfected with sufficient frequency in order to minimize or prevent contamination of milk.
- After disinfection, tankers and cans should be drained.
- Lorries, trucks or other vehicles which carry the tank or cans should be cleaned whenever necessary.

3.3.4.3 Transport time and temperature

- Transport temperature and time should be such that milk is transported to the dairy or to the collection/chilling centre in a manner that minimizes any detrimental effect on the safety and suitability of milk.
- The time and temperature conditions for the collection and transport of milk from the farm should be established taking into account the effectiveness of the control system in place during and after processing, the hygienic condition of the milk and the intended duration of storage. In situations where the milk cannot be chilled on the farm, collection and delivery of this milk to a collection centre or processing facility within certain time limits may be required. These conditions may be specified in legislation, in Codes of Practice, or by the manufacturer receiving the milk in collaboration with the milk producer, collector and transporter and the competent authority.

Additional provisions for the production of milk used for raw milk products

- The temperature of the milk to be used for the manufacture of raw-milk products shall not exceed 8°C, unless the milk has been collected within 2 hours after milking.
- Deviations from this temperature may be acceptable if these deviations will not result in an increased risk of microbiological hazards, have been approved by the manufacturer receiving the milk, have been approved by the competent authority and the end product will still meet the microbiological criteria established in accordance with 5.2.3.2.

3.4 Documentation and recordkeeping

With respect to food safety, records should be kept where necessary on:

- Prevention and control of animal diseases with an impact on public health;
- Identification and movement of animals;
- Regular control of udder health;
- Use of veterinary drugs and pest control chemicals;
- Nature and source of feed;
- Milk storage temperatures;
- Use of agricultural chemicals;
- Equipment cleaning.

ANNEX II

GUIDELINES FOR THE MANAGEMENT OF CONTROL MEASURES DURING AND AFTER PROCESSING

INTRODUCTION AND OBJECTIVES

The detailed information contained in this annex should be implemented in order to prevent, eliminate or reduce hazards associated with incoming materials to acceptable levels and to reduce the likelihood of milk contamination resulting from inadequate control of manufacturing operations. This information will enable the implementation of the principles laid down in Section 5 of the main body of the Code by providing guidelines for their application.

These measures should be used in combination with guidelines on primary production found in Annex I in order to effectively control the microbiological hazards in milk products. There is a close relationship between the control of manufacturing operations and the safety and suitability of processed milk products based on the control measures presented in Annex II.

SCOPE

The provisions in this Annex reinforce and supplement the principles and guidelines specified in Section 5 of the Code (Control of Operation), in particular Section 5.1, and should apply to the manufacture of any milk product. The principles in Section 5, Control of Operation, as well as the hazard identification provisions of this annex apply not only to the control of microbial hazards but also to the control of chemical and physical hazards.

The most common microbiological control measures are addressed in further detail in Part A (microbiostatic control measures) and Part B (microbiocidal control measures), respectively. However, this does not preclude in any way the use of additional and/or alternative microbiological control measures, provided that the general guidance provided in this Annex is followed.

USE OF ANNEX II

The information in Annex II is organized to correspond with the relevant sections in the main part of the Code and the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969. Where a particular principle has been identified in the main body of the Code, guidelines for the application of that principle will be located in the corresponding section of this part of the Annex.

These guidelines are supplemental to those contained in Section 5 of the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969

(including the Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application Annex) and to the overarching principles presented in Section 2.3 of the base document.

The guidelines presented in this annex are intended to enhance and supplement those aspects of the *Recommended International Code of Practice – General Principles of Food Hygiene* HACCP Annex which are critical to the successful design of a system of food safety controls. The users of this document are encouraged to implement the guidelines contained in the HACCP Annex when designing a HACCP system and to refer to those Annex II guidelines for further details on the hazard analysis, control measure selection and critical limit determination.

DEFINITIONS

The definitions below apply for the purpose of this Annex, and in addition to those definitions contained in Section 2.5 of the main body of this Code.

Microbiocidal treatments are control measures that substantially reduce or practically eliminate the number of micro-organism present in a food.

Microbiostatic treatments are control measures that minimize or prevent the growth of micro-organisms present in a food.

Pasteurization is a microbiocidal heat treatment aimed at reducing the number of any pathogenic micro-organisms in milk and liquid milk products, if present, to a level at which they do not constitute a significant health hazard. Pasteurization conditions are designed to effectively destroy the organisms *Mycobacterium tuberculosis* and *Coxiella burnettii*.

UHT (ultra-high temperature) ***treatment*** of milk and liquid milk products is the application of heat to a continuously flowing product using such high temperatures for such time that renders the product commercially sterile at the time of processing. When the UHT treatment is combined with aseptic packaging, it results in a commercially sterile product.[7]

5. CONTROL OF OPERATIONS

5.1 Control of food hazards

It is important that control measures are applied during both primary production and processing to minimize or prevent the microbiological, chemical or physical contamination of milk. In addition, special attention should be given during the processing of different milk products so that inadvertent cross-contamination does not occur, including with respect to ingredients that may contain allergenic substances. *Note: A distinction can be drawn between the types of control measures used for microbiological hazards and those used for chemical and physical hazards. The control*

[7] The concepts of aseptic packaging and commercially sterile can be found in the Codex documents on Low Acid and Acidified Canned Foods (CAC/RCP 23-1979) and Aseptic Processing (CAC/RCP 40-1993).

measures used for chemical and physical hazards in food are generally preventive in nature, i.e., they focus on avoiding the contamination of food with chemical or physical hazards in the first place rather than on reducing or eliminating such hazards once they have been introduced into the product. It should be noted however that there are some exceptions to this type of distinction, e.g., the use of filters, screens and metal detectors to remove certain physical hazards.

Microbiological food hazards are controlled by appropriate selection of control measures applied during primary production in combination with control measures applied during and after processing. The result of applying any microbiocidal control measure depends significantly on the microbial load (including the concentration of microbiological hazards) in the material subjected to it. It is therefore important that preventive measures are applied in primary production to reduce the initial load of pathogenic micro-organisms as well as during processing to avoid contamination within the processing environment. The initial microbial load significantly impacts the performance needed for the microbiological control measures applied during and after processing as well as the performance required for suitability. The safety and suitability of the end product depends not only on the initial microbiological load and the efficiency of the process, but also on any post-process growth of surviving organisms and post-process contamination.

Individual control measures should be selected and applied in such combination as to achieve a sufficient performance as to result in end products with acceptable levels of hazards.

Acceptable levels of contaminants in the end product should be identified and be based upon:

- Food safety objectives, end product criteria and similar regulatory requirements, as applicable;
- Acceptable levels derived from the purchaser constituting the subsequent link of the food chain; and/or
- The maximum levels found acceptable by the manufacturer, taking into account acceptable levels agreed with the customer and/or regulatory measures established by public health authorities.

The guidelines contained in sections 5.1.1 to 5.1.3 are intended to be supplemental to the *Recommended International Code of Practice – General Principles of Food Hygiene* HACCP Annex.

5.1.1 Hazard identification and evaluation

Hazard identification can be separated into two distinctly different parts, the identification of all potential hazards and the evaluation of the identified potential hazards to determine which are considered to have severe adverse health effects and/or are reasonably likely to occur and therefore need to be controlled through the implementation of effective control measures.

The hazard identification should be based on the initial descriptions developed during preliminary steps contained in the *Recommended International Code of Practice – General Principles of Food Hygiene,* CAC/RCP 1-1969, HACCP Annex and on experience, external information, as well as epidemiological and other historical data that have been associated with the type of food under consideration, the type of raw materials and ingredients used, and that may be introduced during the processing distribution. To insure a comprehensive approach, the various step(s) in the manufacturing process, from material selection through processing and distribution, where a hazard may occur or be introduced should be identified.

The potential hazards for such consideration should be listed in relation to the identified acceptable levels, including established FSO(s), where available.

For microbiological hazards, the likelihood of occurrence will depend on the actual prevalence in the milk and raw materials used. Factors influencing the prevalence are climatic conditions, animal species, prevalence of animal disease (sub-clinically or clinically) caused by the organism, prevalence of mastitis including the relative distribution of causing organisms, the adequacy of primary production practices including the potential of environmental contamination (feeding practices, water quality, milking hygiene level), and the potential for human contamination. Consultation of the competent authorities having jurisdiction in relation to the herds is appropriate.

When evaluating potential microbiological hazards, consideration should be given to which of the organisms are likely to be present in the milk. For instance, microbiological hazards that are not relevant in the geographical area of concern (e.g. because the prevalence is insignificant or zero) can be ruled out at an early stage. Also, where it can be verified that specific sanitary measures are successfully applied during primary production to prevent or significantly reduce introduction of a pathogen into the herd, including efficient eradication programmes, the pathogen in question may be ruled out. The manufacturer or other appropriate party is responsible for documenting the conditions that support such a determination. This can be accomplished by documenting the OIE status (e.g. disease-free area), the effectiveness of national programmes, the effectiveness of individual producer screening programmes, on the basis of documented historical evidence, and through the development of epidemiological evidence.

Regular analysis of the milk (including but not restricted to microbiological analyses) received at the manufacturing establishment producing milk products can be used to verify the implementation of control measures affecting the likelihood of occurrence of a hazard, depending upon the technology used and the kind of milk product being made.

Hazard identification should take into consideration the allergenic nature of some foods. Milk products may contain ingredients such as nuts, eggs and cereal grains that are known to be allergens.

Further, any additional hazards that can be introduced into the milk product during and after processing (e.g. environmental contamination, human contamination) should also be considered. During such considerations, the effectiveness of preventive measures taking place in the manufacturing environment (e.g., environmental and equipment sanitation programmes, employee practices, pest control programmes, etc.) should be evaluated to determine the likelihood of occurrence of potential hazards.

5.1.2 Control measure selection

Note: While the following guidelines are focused on the control of microbiological hazards, the concepts presented herein can be applied as well to the control of chemical and physical hazards.

The next step in the hazard analysis process is to select control measures that will be effective in controlling those hazards. A number of such control measures are further described in Appendices A and B of Annex II.

Selection of individual control measures

Individual microbiological control measures can be grouped according to primary function as follows:

- *Microbiocidal control measures* that reduce the microbial load, for instance by killing, inactivation or removal. These may be applied during processing as processing steps (e.g. microfiltration, thermization, pasteurization) or after the processing as intrinsic factors (e.g. ageing).
- *Microbiostatic control measures* that prevent, limit or retard the growth of micro-organisms by chemical or physical means. These are used to stabilize the product against activity of pathogens and spoilage organisms and may apply after milk production, during processing (e.g. in between processing steps) and after processing. Microbiostatic control measures still imply some probability of growth. Microbiostatic control measures that are efficient after processing may be applied towards the product (e.g. temperature/time control) as extrinsic factors or be built into the product as intrinsic factors (e.g. preservatives, pH).
- *Microbiostatic control measures that prevent direct contamination* of product, for instance by closed circuits or by appropriate packaging to protect the product. These are used to physically prevent contamination, in particular, during packaging and/or after processing.

The use of a single processing step may have subsequent microbiological effects (e.g. reduction of pH, water content), while other microbiological control measures only reduce the number of micro-organisms at the point in the manufacturing process, where it is applied.

Combination of microbiological control measures

More than one microbiological control measure is usually needed to control microbial content, to retard or prevent spoilage and to help prevent food borne diseases. Suitable combinations can be devised in order that specific organisms of concern can

be reduced in number and/or no longer grow/survive in the product. Such suitable combinations are sometimes referred to by the dairy industry as "hurdle technology". The combination of control measures has two main objectives:

- During processing: Providing assurance that the levels of the pathogens (and/or spoilage organisms) of concern, where present, are kept at or reduced to acceptable levels.
- After processing (packaging, distribution and storage): Providing assurance that the acceptable levels of the pathogens (and/or spoilage organisms) of concern that have been achieved during processing are kept under control throughout shelf life.

It may be necessary to ensure that growth of micro-organisms is kept to a minimum prior to processing, in between different processing steps, and after processing. The microbiostatic control measures used should be adapted to the need of the particular product in the particular situation. The resulting outcome in terms of the safety and suitability of the end product does not depend only on the initial microbial load and the effectiveness of the process, but also on any post-process growth of surviving organisms and post-process contamination. Therefore, all microbiological control measure combinations should be supported by appropriate preventive measures prior to and after the process, as deemed necessary.

Depending on the source and possible routes of contamination, the hazard(s) may be kept under control by preventive measures implemented at primary production level and/or in processing environments. When evaluating microbiological preventive measures, it is particularly important to know which of the hazards are affected by the preventive measure and to what extent the measure reduces the probability of the hazard contaminating the milk product during milking, processing and/or distribution. Those microbiological hazards that are not managed adequately by preventive and microbiostatic control measures need to be managed and controlled by adequate microbiocidal control measures with sufficient combined performance.

Microbiological control measures having effect only at the point of application must be applied in appropriate combinations with other microbiological control measures.

The combination of microbiological control measures is most efficient when it is *multi-targeted*, that is, when various individual measures are selected so that different factors effecting microbial survival are targeted, e.g., pH, A_w, availability of nutrients, etc. In many cases, a multi-targeted combination using microbiological control measures with low intensity may be more effective than one single measure with high intensity. The presence of a number of microbiological control measures inhibiting or reducing the number of micro-organisms may be *synergistic*, that is that interaction occurs between two or more measures so that their combined effect is greater than the sum of their individual effects. Therefore, the utilization of synergistic effects can allow for combining microbiological control measures of less intensity than would be otherwise expected from each measure individually.

Where flexibility from provisions in Annex I is granted for small holder dairy farms, particular attention should be paid to the nature of the granted deviations and their potential consequences in terms of hazard levels in the milk.

Attention should be paid to the application of microbiocidal control measures with such performance that they effectively eliminate any risks associated with the transfer of additional zoonotic hazards to the milk. Similarly, where certain animal diseases are present in herds producing the milk, particular attention should be drawn to the recommendations in the *OIE International Animal Health Code*, as specific microbiocidal control measures or performances thereof may be necessary to eliminate the animal health risks associated with these diseases.

5.1.3 Establishment of process criteria

From the performance required, the corresponding process criterion or criteria (as appropriate to the nature of the microbiological control measure) should be established. They are intended for the appropriate implementation (set-up) of a processing step and for application in practical process control (e.g. filter size, pH, concentration of preservative, time/temperature combinations). In the context of HACCP, process criteria may or may not constitute critical limits.

The performance of control measures and control measure combinations selected should be validated using procedures outlined in the *Guidelines for the Validation of Food Hygiene Control Measures* (in preparation). The validation of control measures or control measure combinations is especially important when establishing the effectiveness of new or developing technologies. validation may not be necessary in situations where well established control measures or technologies are considered to be acceptable.

If the performance required cannot be achieved by the control measure(s) or if it is estimated and/or monitoring shows that the hazards are not under sufficient control by the selected combination of microbiological control measures, modification of the control system design is necessary.

Examples of some of the modifications that can be made until the hazard of concern is considered under control include:

- Increase of the intensities of the microbiological control measure(s) applied.
- Identification of additional microbiological control measure(s) that target the hazard of concern.
- Implementation of more stringent on-farm control measures.
- Introduction of specifically targeted measures at farm level that reduce the prevalence of the hazard of concern in the milk used.
- Reduction of the intended shelf life and/or amendments of the intended storage conditions.

Additional provisions for the manufacture of raw milk products

It is critical for a dairy farm, when producing milk intended for the manufacturing of raw milk product, to comply with the provisions (including the identified additional

provisions) detailed in Annex I and in section 5.2.3.1 of this Annex, and these activities should be frequently monitored and evaluated for their effective implementation. This evaluation may lead to the identification of needed improvements at the primary production level (practices, equipment, environment, etc.) or in the classification of dairy farms according to their ability to provide milk for the processing of raw milk products.

Any non-compliance detected either at the farm level or at the milk reception of a manufacturing plant should result in immediate action that may affect the farm, the manufacturing establishment or both. For this reason, there should be clear communication between the manufacturer and the farm and, if necessary, technical assistance should be provided to the primary producer by the manufacturer.

5.2 Key aspects of hygiene control systems

5.2.1 Time and temperature control

5.2.1.2 Distribution of finished products

Perishable products

- The storage temperature should be sufficient to maintain product safety and suitability throughout the intended shelf life. If the temperature of the product is the principal means of preservation, it is essential that the product be maintained at the appropriate temperature. Validation of the selected temperature should be carried out except in situations where well established storage temperatures are considered acceptable.
- Regular and effective monitoring of temperatures of storage areas, transport vehicles and store display cases should be carried out where:
  - the product is stored, and
  - the product is being transported, within the product load, which could be done by using temperature indicating and recording systems;
  - the product is being presented for retail sale.
- Particular attention should be paid throughout storage and distribution to:
  - periods of defrosting of refrigeration units;
  - temperature abuse; and
  - overloading the cold storage facility.

Products stable at ambient temperatures

Products that can be stored at ambient temperatures, should be protected against external agents and contamination, e.g., direct sun radiation, excessive heating, moisture, external contaminants, etc. from rapid temperature changes which could adversely affect the integrity of the product container or the safety and suitability of the product.

5.2.1.3 Establishment of shelf life

- Product shelf life is influenced by a number of factors, such as:
  - applied microbiological control measures, including storage temperatures;

- cooling methods applied to product;
- type of packaging (e.g., hermetically sealed or not, modified atmosphere packaging);
- likelihood of post-process contamination and type of potential contamination.

— The shelf life of milk products may be limited by microbial changes (e.g., deterioration and growth of pathogenic and spoilage micro-organisms to unacceptable levels).

— When establishing product shelf life, it is the responsibility of the manufacturer to assure and, as necessary, to demonstrate, that the safety and suitability of the milk product can be retained throughout the maximum period specified, taking into consideration the potential for reasonably anticipated temperature abuse during manufacture, storage, distribution, sale and handling by the consumer.

— These temperature abuses may allow the growth of pathogenic micro-organisms, if present, unless appropriate intrinsic factors are applied to prevent such growth.

Explanatory note: Reasonably anticipated temperature abuse takes into account the normal period of transporting of purchased products to appropriate consumer storage facilities and normal patterns of handling during consumption, for instance, the number and length of periods in which the product is removed from the refrigerator and subjected to ambient temperatures until the whole package has been consumed.

— The possible reactivation of pathogens with time should be taken into account when determining the shelf life.

— Shelf life determination can be carried out at the plant level by testing products subjected to the storage conditions specified or by predicting microbial growth in the product under the specified storage conditions. Reasonable anticipated temperature abuse can be integrated into the study or be taken into account by applying an appropriate safety factor (e.g., by shortening the maximum durability specified in the labelling or by requiring lower storage temperatures).

5.2.2 Microbiological and other specifications

5.2.2.1 Milk

— The milk used for the manufacture of products covered by this Code should be evaluated based on sampling of milk from individual farms or milk collection centres.

— Upon receiving, the milk should be subject to olfactory and visual inspection. Other criteria (e.g., temperature, titratable acidity, microbiological and chemical criteria) should be used to detect unacceptable conditions.

— Any-non-compliance with the above mentioned criteria, and in particular with regards to pathogens, should result in immediate corrective actions at the farm level and in the manufacturing establishment, for example: rejection of the milk for the processing of raw milk products; corrective actions on the milking procedure (cleaning and sanitation procedures of the milking equipment, cleaning or sanitation procedures of the udder, etc.,); quality of feed; the hygienic quality of the water supply; practices in animal holding areas; individual

check of animals to find the animal(s) that may be the carrier; isolation of that animal from the herd as necessary. Corrective actions should be identified and implemented, and specific assistance to the dairy farm may need to be provided.

- In some cases, where more comprehensive control measures are put into place to ensure the safety and suitability of milk, as may be the case for raw milk intended to be used in the production of raw milk products, it may be necessary to classify farms into two categories: those acceptable for use in raw milk products and those that are not.

Additional provisions for milk used in the manufacture of raw milk products

- Depending on the hazard analysis performed by the manufacturer and the combination of microbiological control measures applied during and after processing of milk products, specific microbiological criteria regarding pathogens (for example: *Salmonella* spp., *Listeria monocytogenes*) may need to be established.

APPENDIX A
MICROBIOSTATIC CONTROL MEASURES

Note: The control measures described in this appendix are presented as descriptive examples only and require validation prior to use with respect to their effectiveness and safe use.

Microbial growth is dependent upon many conditions in the organism's environment such as: ingredients, nutrients, water activity, pH, presence of preservatives, competitive micro-organisms, gas atmosphere, redox-potential, storage temperature and time. Control of these conditions can therefore be used to limit, retard, or prevent microbial growth.

Such microbiological control measures as well as microbiological control measures protecting the product against direct microbial contamination from the surroundings have microbiostatic functions.

Many microbiostatic control measures act by interfering with the homeostasis[8] mechanisms that micro-organisms have evolved in order to survive environmental stresses.

Maintaining a constant internal environment requires significant energy and material resources of the micro-organism, and when a microbiological control measure disturbs the homeostasis there will be less energy left for the micro-organism to multiply. Consequently, the organisms will remain in the lag phase and some may even die out before the homeostasis is re-established.

[8] Homeostasis is the constant tendency of microorganisms to keep their internal environment stable and balanced. For instance, microorganisms spend considerable efforts keeping their internal pH and osmotic pressure within narrow limits.

Examples of typical microbiostatic control measures include the following:

Carbon dioxide (CO_2):	The addition and/or formation of carbonic acid to obtain a multiple inhibitory effect, including the creation of anaerobic conditions by replacing oxygen, reducing pH, inhibiting certain intracellular enzymes (decarboxylation), and inhibiting the transport of water-soluble nutrients across the membrane (by dehydrating the cellular membrane). The efficiency depends mainly on the point of application. In ripened cheese, the emission of carbon dioxide from the cheese to the outside environment is often utilized to provide (almost) anaerobic conditions in the headspace of cheese packaging
Coatings:	The introduction of a physical barrier against contamination, with or without antimicrobial substances implemented into it (immobilized) to obtain a slow migration of these from the surface.
Freezing:	The lowering of temperature below the freezing point of the product combined with a reduction of the water activity. Freezing has microbiostatic as well as microbiocidal effects.
Lactoferrins:	Retardation through the utilization of naturally present glycoproteins (highest concentration in colostrum) to prolong the lag phases of bacteria for 12–14 hours, by binding iron in the presence of bicarbonates.
Lactoperoxidase system[9]:	The activation of the lactoperoxidase/thiocyanate/hydrogen peroxide system (indigenous system in milk) to inactivate several vital metabolic bacterial enzymes, consequently blocking their metabolism and ability to multiply. Guidance for application is provided in the *Codex Guidelines for Preservation of Raw Milk by the Use of the Lactoperoxidase System* (CAC/GL 13-1991).
Modified atmosphere:	The establishing of a gaseous environment (either low in oxygen and/or high in carbon dioxide or nitrogen) to limit growth of aerobic micro-organisms by impairing biochemical pathways. Modified atmosphere packaging (MAP) means that a modification of the gas atmosphere in the packaging is created. Establishing anaerobic environment to limit growth of aerobic micro-organisms may proliferate certain anaerobic pathogenic micro-organisms.

[9] These microbiostatic control measures should only be used as a last resort in countries where infrastructure does not permit cooling of milk at farm level or at collection centres. Whenever used, chemical methods should never replace nor delay implementing good hygienic practices in milk production. The use of the lactoperoxidase system for milk and milk products in international trade will be re-examined by the Committee on Food Hygiene (CCFH) after completion of an expert review by FAO and WHO of available data and considering the FAO Lactoperoxidase Expert Group report about potential risks and benefits of lactoperoxidase system. CCFH will then review the issue in 2006.

Packaging:	Packaging provides a physical barrier that protects against access of micro-organisms from the surroundings.
pH reduction:	The creation of extra-cellular acid conditions that enables hydrogen ions to be imported into the cytoplasma of micro-organisms, thus disturbing the homeostasis mechanism of the intracellular pH responsible for maintaining functionality of key cell components vital for continuing growth and viability. Low pH values are obtained by fermentation or addition of acids (inorganic or organic). The pH value for preventing growth depends on the pathogen, but lies typically between pH 4.0–5.0. Micro-organisms become more sensitive to other microbiological control measures at lower pH. Synergy occurs with salt, water activity, organic acids, the LP-system, and antimicrobial substances.
(Use of) preservatives:	The addition of certain additives to enhance keeping quality and stability through direct or indirect antimicrobial and/or fungicidal activity. Most preservatives are rather specific and have effect only on certain micro-organisms.
Redox potential control:	The redox potential (Eh) is a measure of the oxidizing or reducing potential of food systems that determines whether aerobic or anaerobic micro-organisms are able to grow. Eh is influenced by removal of oxygen and/or addition of reducing substances (e.g. ascorbic acid, sucrose, etc.).
Refrigeration:	The lowering of product temperature to limit microbial activity
Time:	The practice of applying very short collection/storage periods, limiting the shelf life of products, or immediate processing of raw milk to ensure that all micro-organisms present are in the lag phase, and therefore not active and more susceptible to other microbiological control measures.
Water activity control:	The control of the water activity (aw) in the product (the accessibility of water for micro-organisms, not the water content in the food), expressed as the ratio of water vapour pressure of the food to that of pure water. The aw value for preventing growth depends on the pathogen, but lies typically between 0.90 and 0.96. Water activity can be controlled by: • concentration, evaporation and drying, which also increase the buffering capacity of milk (synergy); • salting (addition of sodium chloride), which also reduces the cell resistance against carbon dioxide and in the solubility of oxygen (synergy); and • sweetening (addition of sugars), which at aw below 0.90–0.95 also results in an antimicrobial effect, depending on the type of sugar (synergy).

APPENDIX B
MICROBIOCIDAL CONTROL MEASURES

Note: the control measures described in this appendix are presented as descriptive examples only and require validation prior to use with respect to their effectiveness and safe use.

Microbiocidal or practical elimination control measures act by reducing the microbial load, for instance through killing, inactivation or removal.

Many microbiological control measures have multiple functions. Some microbiostatic control measures also have microbiocidal effects, the degree often depending upon the intensity at which they are applied (e.g. pH reduction, refrigeration, freezing, preservatives and indigenous antimicrobial systems).

Pasteurization and other heat treatments of milk that have at least an equivalent efficiency are applied at such intensities (sufficient time/temperature combinations) that they practically eliminate specific pathogens. They have therefore been traditionally used as key microbiocidal control measures in the manufacture of milk products. Non-thermal microbiocidal control measures with similar efficiencies are not yet applied at such intensities that will render the milk product safe at the point of application.

Examples of typical microbiocidal control measures include the following:

Centrifugation:	The removal of microbial cells of high density from milk using high centrifugal forces. Most efficient against microbial cells of high density, notably bacterial spores and somatic cells
Commercial sterilization:	The application of heat at high temperatures for a time sufficient to render milk or milk products commercially sterile, thus resulting in products that are safe and microbiological stable at room temperature.
Competitive microflora:	The reduction of the number of undesirable micro-organisms by lowering the pH, consumption of nutrients, and production of bacterial antimicrobial substances (such as nisin, other bacteriocins and hydrogen peroxide). Usually, this microbiological control measure is applied by choice of starter cultures. The efficiency is determined by many factors, including the speed and level of pH-reduction and variations in the pH level.
"Cooking" of cheese curd:	The application of heat to cheese curd, mainly for technical purposes. The heat treatment has a lower intensity than thermization but stresses micro-organisms to become more susceptible to other microbiological control measures.

Electromagnetic energy treatment:	Electromagnetic energy results from high voltage electrical fields, which alternate their frequency millions of times per second (< 10^8 MHz). Examples are microwave energy (thermal effect), radio-frequency energy (non-thermal effects) or high electric field pulses (10–50 kV/cm, non-thermal effects). The treatment destroys cells by establishing pores in the cell walls due to the build up of electrical charges at the cell membrane.
High-pressure treatment:	Application of high hydrostatic pressures to irreversibly damage the membranes of vegetative cells.
Microfiltration:	Removal of microbial cells, clumps and somatic cells by recirculation over a microfilter. Normally, a pore size of ~0.6–1.4 μm is sufficient to separate most bacteria. Synergy in combination with heat treatment.
Pasteurization:	The application of heat to milk and liquid milk products aimed at reducing the number of any pathogenic micro-organisms to a level at which they do not constitute a significant health hazard.
Pulsed high-intensity light:	The application of (on e.g. packaging material, equipment and water) high intensity broadband light pulses of wavelengths in the ultraviolet, visible and infrared spectrum (~20 000 times sunlight) to destroy micro-organisms. Due to the inability to penetrate in-transparent substances, the technology is only effective against surfaces, for instance, in the removal of biofilm and can therefore prevent cross contamination
Ripening (ageing):	The holding for such time, at such temperature, and under such conditions as will result in the necessary biochemical and physical changes characterizing the cheese in question. When applied as a microbiocidal control measure, the multifactoral, complex system developing in cheese (pH, antagonistic flora, decreased water activity, metabolism of bacteriocins and organic acids) is utilized to influence the microenvironment in and on the food and consequently the composition of the microflora present.
Thermization:	The application to milk of a heat treatment of a lower intensity than pasteurization that aims at reducing the number of micro-organisms. A general reduction of log 3–4 can be expected. Micro-organisms surviving will be heat-stressed and become more vulnerable to subsequent microbiological control measures.

Ultrasonication:	The application of high intensity ultrasound (18-500 MHz) that cause cycles of compression and expansion as well as cavitation in microbial cells. Implosion of microscopic bubbles generates spots with very high pressures and temperatures able to destroy cells. More effective when applied in combination with other microbiological control measures. When applied at higher temperatures, the treatment is often referred to as "thermosonication".
Warm sealed packaging:	The application of heat (80 to 95 °C) to a solid end product in connection with the packaging process, for instance to maintain the product at a viscosity suitable for packaging. Such process can be done in a continuous flow system or in batch processes. The product is sealed at the packaging temperature and chilled for storage/distribution purposes afterwards. When combined with low pH in the product, e.g. below 4.6, the warm sealed product may be commercially sterile as any surviving micro-organisms may not be able to grow. A supplementary microbiostatic control measures is to ensure adequate cooling rates of packaged products to minimize potential for *B. cereus* growth.

1. Pasteurization of milk and fluid milk products

1.1 Description of process

Pasteurization can either be carried out as a batch operation ("batch pasteurization" or "LTLT-pasteurization" (low temperature, long time)), with the product heated and held in an enclosed tank, or as a continuous operation ("HTST-pasteurization" (high temperature, short time)) with the product heated in a heat exchanger and then held in a holding tube for the required time.

Currently, the most common method of pasteurization is by means of heat exchangers designed for the HTST process (high temperature short time). This process involves heating of the milk to a certain temperature, holding at that temperature under continuous turbulent flow conditions for a sufficiently long time, to ensure the destruction and/or inhibition of any hazardous micro-organisms that may be present. An additional outcome is the delay of the onset of microbiological deterioration, extending the shelf life of milk.

To save energy, heat is regenerated, i.e. the chilled milk feeding the exchangers is heated by the pasteurized milk leaving the pasteurization unit. The effect of this pre-heating is cumulative, and should be taken into account when simulating pasteurization conditions at laboratory scale.

Pasteurization carried out in a batch-process involves the heating of milk placed in a container to a certain temperature for sufficiently long time to achieve equivalent

effects as in the case of the HTST process. The heat can be supplied externally or internally in heat exchangers or within a pasteurizer. Due to the non-continuous flow conditions, heating and cooling takes longer and will add to the effect (cumulative).

1.2 Process management

Performance criteria

As *C. burnettii* is the most heat-resistant non-sporulating pathogen likely to be present in milk, pasteurization is designed to achieve at least a 5 log reduction of C. *burnettii* in whole milk (4% milkfat).

Process criteria

According to validations carried out on whole milk, the minimum pasteurization conditions are those having bactericidal effects equivalent to heating every particle of the milk to 72 °C for 15 seconds (continuous flow pasteurization) or 63 °C for 30 minutes (batch pasteurization). Similar conditions can be obtained by joining the line connecting these points on a log time versus temperature graph.[10]

Processing times necessary rapidly decrease with minimal increase in temperature. Extrapolation to temperatures outside the range of 63 to 72 °C, in particular, processing at temperatures above 72°C must be treated with the utmost caution as the ability for them to be scientifically [validated] is beyond current experimental techniques.

For example, it would be extremely difficult if not impossible to determine pasteurization efficiency at 80°C given the extrapolated processing time would be around 0.22 seconds to achieve at least a 5 log reduction.

To ensure that each particle is sufficiently heated, the milk flow in heat exchangers should be turbulent, i.e. the Reynolds number should be sufficiently high.

When changes in the composition, processing and use of the product are proposed, the necessary changes to the scheduled heat treatment should be established and a qualified person should evaluate the efficiency of the heat treatment.

For instance, the fat content of cream makes it necessary to apply minimum conditions greater than for milk, minimum 75 °C for 15 seconds.

Formulated liquid milk products with high sugar content or high viscosity also require pasteurization conditions in excess of the minimum conditions defined for milk.

[10] Note**:** The time/temperature combinations for HTST pasteurization were established many years ago on the basis of the hygiene status at that time (quality of raw milk and of hygiene management levels). With time, the hygiene status has increased considerably. However, the tradition to specify the minimum time/temperature combinations in regulatory texts has not enabled the elevation of the hygiene status to be converted into the application of microbiocidal control measures of less intensity. Instead, it has been (and still is) converted into extension of the product shelf life.

Verification of process

The products subjected to pasteurization should show a negative alkaline phosphatase reaction immediately after the heat treatment as determined by an acceptable method. Other methods could also be used to demonstrate that the appropriate heat treatment has been applied.

Alkaline phosphatase[11] can be reactivated in many milk products (cream, cheese, etc.). Also, micro-organisms used in the manufacture may produce microbial phosphatase and other substances that may interfere with tests for residual phosphatase. Therefore, this particular verification method must be performed immediately after the heat treatment in order to produce valid results. *Note: Low residual alkaline phosphatase levels in heat-treated milk (below 10 μg p-nitro-phenol equivalent/ml) are taken as assurance that the milk has been correctly pasteurized and that it has not been contaminated by raw milk. However, although this measure is still considered as being the most appropriate method of verification, the factors listed below influence the residual levels and should be taken into account when interpreting the results:*

Initial concentration in milk: the "pool" of alkaline phosphatase present in milk varies widely between different species and within species. Typically, raw cow's milk shows an activity much higher than goats milk. As pasteurization results in a log reduction of the initial level, the post-pasteurization residual level will vary with the initial level in the raw milk. Consequently, different interpretation according to origin of the milk is necessary and in some cases, the use of alkaline phosphatase testing to verify pasteurization may not be appropriate.

Fat content of the milk: Phosphatase is readily absorbed on fat globules, thus the fat content in the product subjected to pasteurization influence the result (typical concentrations in cows milk: skim 400 μg/ml; whole 800 μg/ml, and 40% cream 3500 μg/ml).

Application of pre-heating: The level of alkaline phosphatase is decreased with heat, such as at temperatures typically applied in separation and in thermization.

1.3 Application of pasteurization

Numerous manuals recognized by competent authorities exist for the correct layout, designs and constructions of suitable pasteurizing equipment as well as for practical operation and monitoring. Such manuals should be available and consulted whenever necessary.

[11] Milk from different species of milking animals normally contains different levels of alkaline phosphatase. These differences should be taken into account when establishing criteria for phosphatase analysis and when establishing the effectiveness of alkaline phosphatase testing as a means to verify that pasteurization conditions have been properly applied.

2. Commercial sterilization of milk and milk products

Details on the establishment of thermal processes designed to render milk or milk products commercially sterile can be found in the Codex document on Low-Acid Canned Foods (CAC/RCP 23-1979) and the Codex document on Aseptic processing (CAC/RCP 40–1993).

2.1 Description of process

Commercial sterilization is a microbiocidal control measure that can be obtained by various heat treatments, the most common and [validated] methods being UHT (ultra high temperature) processing in combination with aseptic packaging or In-container Sterilization.

UHT treatment is a continuous operation that can either be carried out by direct mixing of steam with the product to be sterilized, or by indirect heating by means of a heat exchanging surface, followed by further aseptic processing (eventual) and aseptic packaging/filling. Thus the UHT plant are constituted by heating equipment in conjunction with appropriate packaging equipment and, eventually, additional treatment equipment (e.g. homogenization).

In-container sterilization may be a batch or continuous process.

2.2 Process management

Performance criteria

Thermal processes necessary to obtain commercially sterile products are designed to result in the absence of viable micro-organisms and their spores capable of growing in the treated product when kept in a closed container at normal non-refrigerated conditions at which the food is likely to be held during manufacture, distribution and storage.

Process criteria

For products at risk of contamination with *Clostridium botulinum* such as certain composite milk products (as identified as likely to occur by a hazard analysis), the minimum thermal process should be established in consultation with an official or officially recognized authority. Where the risk of contamination with *Clostridium botulinum* is lower, alternative thermal processes may be established by an official or officially recognized authority, provided that the end products are microbiologically shelf stable and verified.

The combined effects of two or more treatments may be considered additive provided they comprise a single continuous process.

UHT treatment

UHT treatment is normally in the range of 135 to 150 °C in combination with appropriate holding times necessary to achieve commercial sterility. Other equivalent conditions can be established through consultation with an official or officially recognized authority.

Validation of milk flow and holding time is critical prior to operation.

See CAC/RCP 40–1993 for aspects of aseptic processing and packaging not already covered by this code.

Verification of process

The products subjected to commercial sterilization must be microbiologically stable at room temperature, either measured after storage until end of shelf life or incubated at 55 °C for 7 days (or at 30 °C for 15 days) in accordance with appropriate standards. Other methods could also be used to demonstrate that the appropriate heat treatment has been applied.

2.3 Application of commercial sterilization

Numerous manuals exist for the establishment of thermal processes needed to achieve commercial sterility, for the proper layout, designs and constructions of suitable sterilization equipment and for practical operation and monitoring of thermal processing equipment. Such manuals should be available and consulted whenever necessary.

Also, see CAC/RCP 23-1979 for aspects of in-container sterilization not already covered by this code.

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Milk and Milk Products

Codex standards for milk and milk products and other related texts such as the *Code of Hygienic Practice for Milk and Milk Products* are published in this compact format to allow their wide use and understanding by governments, regulatory authorities, food industries and retailers, and consumers. This first edition includes texts adopted by the Codex Alimentarius Commission up to 2007.

The Codex Alimentarius Commission is an intergovernmental body with over 170 members, within the framework of the Joint FAO/WHO Food Standards Programme established by the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO). The main result of the Commissions' work is the *Codex Alimentarius,* a collection of internationally adopted food standards, guidelines, codes of practice and other recommendations, with the objective of protecting the health of consumers and ensuring fair practices in the food trade.

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX ALIMENTARIUS COMMISSION

ISBN 978-92-5-105837-4 ISSN 0259-2916

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TC/M/A1387E/1/12.07/6000

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