

Provolone Cheese — Specification

PUBLIC REVIEW DRAFT

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The following organizations were represented on the Technical Committee:

Kenya Dairy Board
Ministry of Health — Public Health Department
Ministry of Agriculture, Livestock and Fisheries — State Department of Livestock
Ministry of Agriculture, Livestock and Fisheries — Department of Veterinary Services
Egerton University — Department of Dairy and Food Science Technology
Government Chemist's Department
National Public Health Labs
Kenya Industrial Research and Development Institute (KIRDI)
Consumer Information Network
New Kenya Creameries Cooperative (NKCC)
Brookside Dairy Ltd.
Eldoville Dairies Limited
Githunguri Dairy
Happy Cow Ltd
Sameer Agriculture and Livestock (K) Limited KIBIDAV Ltd (TOGGS)
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast with the progress in the industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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Provolone Cheese— Specification

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DKS 2677: 2016

Foreword

This Kenya Standard was prepared by the Milk and Milk Products Technical Committee under the guidance of the Standards Project Committee and it is in accordance with the procedures of the Kenya Bureau of Standards.

Cheese is a very nutritious food which consists of a concentration of the constituents of milk, principally fat, casein and insoluble salts, together with water, in which small amounts of soluble salts, lactose, and albumin from milk are coagulated.

There are various types of cheese that are produced and marketed worldwide. This Kenya Standard specifies the requirements for the type of firm/semi-hard ripened cheese being marketed in Kenya as provolone cheese.

This standard includes a list of food additives, terminology and classification of cheeses, amongst other technical requirements which are important in checking cheese under the regulatory system to prevent adulteration.

In the preparation of this standard useful information was derived from members of the technical committee, Codex general standard for Havarti cheese (CODEX STAN 272-1969) and local manufacturers

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Brie Cheese— Specification

1 Scope

This Kenya Standard specifies requirements and methods of sampling and test Provolone cheese intended for direct consumption or for further processing, in conformity with the description in Clause 3 of this standard.

This Kenya Standard applies to Provolone cheese made from cow's milk

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CODEX STAN 208, Codex Standard for cheese in brine
KS CAC/GL 21, *Recommended international code of hygienic practice for foods for infants and children*
KS CAC/GL 23, *Guidelines for use of nutrition claims*
KS EAS 38, *Labelling of prepackaged foods*
AOAC 942.17, *Arsenic in foods Molybdenum blue method*
AOAC 999.10, *Lead, Cadmium, Copper, Iron, and Zinc in foods, Atomic Absorption Spectrophotometry after dry ashing*
CAC/MRL 2 *Maximum Residue Limits for Veterinary Drugs in Food*
AOAC 962.16 *Beta-lactam Antibiotics in milk*
AOAC 980.21, *Aflatoxin M1 in milk and cheese-thin layer chromatographic method*
AOAC 980.21, *organochlorine and organophosphorous pesticide residues in milk and milk products*
KS 2455, *General Standard- Food Safety*
KS 1552: 2016; *Code of hygienic practice for milk and milk products*
KS 2455, *General Standard- Food Safety*
KS 2194:2009 – *Good Manufacturing practice guide lines and the Dairy industry*
KS EAS 69, *Pasteurized milk- Specification*
KS ISO 707, *Milk and milk products — Guidance on sampling*
KS ISO 1735, *Cheese and processed cheese products — Determination of fat content — Gravimetric method (Reference method)*
KS ISO 2962, *Cheese and processed cheese products — Determination of total phosphorus content — Molecular absorption spectrometric method*
KS ISO 5534, *Cheese and processed cheese — Determination of the total solids content (Reference method)*
KS ISO 5943, *Cheese and processed cheese products — Determination of Sodium chloride content — Potentiometric titration method*
KS ISO 6731, *Milk, cream and evaporated milk - Determination of total solids content (reference method)*
KS ISO 6732; *Milk and milk products -- Determination of iron content -- Spectrometric method (Reference method)*
KS ISO/TS 6733; *Milk and milk products -- Determination of lead content -- Graphite furnace atomic absorption spectrometric method*
KS ISO 11866-2:2007; *Milk and milk products-Enumeration of presumptive escherichia coli - Part 2: Colony-co*
KS ISO 11866-1:2005 (IDF 170-1:2005); *Milk and milk products -- Enumeration of presumptive Escherichia coli -- Part 1: Most probable number technique using 4-methylumbelliferyl-beta-D-glucuronide (MUG).*
KS ISO 6579:2002 *Microbiology of food and animal feeding stuffs - Horizontal method for the detection of Salmonella spp*
KS ISO 11866-2, *Milk and milk products-Enumeration of presumptive escherichia coli - Part 2: Colony-count technique at 44 °C using membrane*
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KS ISO/TS 11869:2012; Fermented milks -- Determination of titratable acidity -- Potentiometric method
KS ISO 14501:2007 Milk and milk powder - Determination of aflatoxin M content - Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography

KS ISO 16649-1:2001; Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of beta-glucuronidase-positive *Escherichia coli* -- Part 1: Colony-count technique at 44 degrees C using membranes and 5-bromo-4-chloro-3-indolyl beta-D-glucuronide

KS ISO 4833-1:2013; Microbiology of the food chain -- Horizontal method for the enumeration of microorganisms -- Part 1: Colony count at 30 degrees C by the pour plate technique

KS ISO 5738:2004 (IDF 76:2004); Milk and milk products -- Determination of copper content -- Photometric method (Reference method)

KS ISO 5546:2010 (IDF 115:2010); Caseins and caseinates -- Determination of pH (Reference method)

KS ISO 6611, Milk and milk products — Enumeration of colony—forming units of yeasts and/or moulds — Colony-count technique at 25 degrees C

KS ISO 6888-1:1999; Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) -- Part 1: Technique using Baird-Parker agar medium

KS ISO 8968-1:2014 (IDF 20-1:2014); Milk and milk products -- Determination of nitrogen content -- Part 1: Kjeldahl principle and crude protein calculation

3 Description

Provolone is a ripened firm/semi-hard cheese in conformity with the General Standard for Cheese (CODEX STAN 283-1978). 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 a rind, which may be coated.

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

4 Essential composition and quality factors

4.1 Raw materials

Cow milk and products obtained from cow milks complying with relevant Kenya standards

4.2 Permitted ingredients

- Starter cultures of harmless lactic acid and/ or flavour producing bacteria and cultures of other harmless micro-organisms including either of the following; *Lactobacillus helveticus*, *Streptococcus salivarius* subsp. *thermophilus*, *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Lactobacillus casei*
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as salt substitute;
- Calcium chloride in an amount not more than 0.02 percent (calculated as anhydrous calcium chloride) of the weight of the dairy ingredients, used as a coagulation aid.

- 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 283-1978), 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 Clause 5.

4.3 compositional requirements

Table 1: compositional requirements for Provolone

Milk constituent	Minimum content (m/m)	Maximum content (m/m)	Reference level (m/m)	Methods of Analysis
Milkfat in dry matter:	45%	Not restricted	45% to 50%	KS ISO 1735
Dry matter (Total Solids):	Depending on the fat in dry matter content according to the table below			KS ISO 5534
	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%		
Moisture%, Max	a) Unsmoked Cheese	47%		KS ISO 5534 or AOAC 977.11 /AOAC 969.19
	(b) Smoked Cheese	45%		
Salt % Max		3%		KS ISO 5943 or AOAC 975.20

5 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.

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Table 2

Additive functional class:	Justified use:	
	Cheese mass	Surface/rind treatment
Colours:	X ^a	—
Bleaching agents:	—	—
Acidity regulators:	X	—
Stabilizers:	—	—
Thickeners:	—	—
Emulsifiers:	—	—
Antioxidants:	—	—
Preservatives:	X	X
Foaming agents:	—	—
Anti-caking agents:	—	X ^b

a) Only to obtain the colour characteristics, as described in Section 2.
 (b) 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.

Table 3

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INS no	Name of additive	Maximum Level
Colours		
160a(i)	Carotene, beta-, synthetic	35 mg/kg singly or in combination
160a(iii)	Carotene, beta-, Blakeslea trispora	
160e	Carotenal, beta-apo-8'-	
160f	Carotenoic acid, ethyl este, beta-apo-	
160a(ii)	Carotenes, beta-, vegetable	600 mg/kg
160b(ii)	Annatto extracts – norbixin based	25 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	Natamycin (pimaricin)	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
252	Potassium nitrate	Singly or in combination (expressed as nitrate ion)
280	Propionic acid	3 000 mg/kg Surface treatment only *
281	Sodium propionate	
282	Potassium propionate	
Acidulants		
170(i)	Calcium carbonate	Limited by GMP
504(i)	Magnesium carbonate	Limited by GMP
575	Glucono delta-lactone	Limited by GMP
Anti-caking agents		
460(i)	Microcrystalline cellulose (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, synthetic	
553(iii)	Talc	

* For the definition of cheese surface and rind see Appendix to the General Standard for Cheese (CODEX STAN 28-1)

6. Hygiene Requirements

6.1 It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of KS 1552:2016 and other relevant Kenya standards and regulations. The products should comply with any microbiological criteria established in accordance with KS CAC/GL 21

6.2 The products shall comply with any microbiological criteria established in accordance with Table 2 below.

Table 4 — Microbiological requirements for Provolone cheese

S/N	Quality	Requirements	Test method
	Total plate count /g, Max	<i>20000 cfu/g</i>	KS ISO 4833
	Listeria monocytogenes <i>max,</i>	<i>Nil per gram</i>	KS ISO 4833
	Salmonella spp in 25g or (ml)	<i>Nil</i>	KS ISO 4833
	Shigella in 25g or (ml)	<i>Nil</i>	KS ISO 21567 or KS ISO 4833
	Clostridium botulinum	<i>Nil, per gram</i>	KS ISO 4833
	Staphylococcus aureus in 25g or (ml)	<i>Nil</i>	KS ISO 4833
	E.coli in 25g or (ml)	<i>Nil</i>	KS ISO 4833
	<i>Faecal coliforms, max</i>	<i>Nil per gram</i>	KS ISO 4832
	<i>Non-faecal coliforms, max</i>	<i>10 cfu/g</i>	KS ISO 4832
	<i>Mould, max</i>	<i>100 cfu/g gram</i>	KS ISO 6611
	<i>Yeast, max</i>	<i>100 cfu/g</i>	KS ISO 6611

7 Contaminants

The products covered by this Standard shall comply with the maximum levels of CODEX STAN 193 and the maximum residue limits for pesticides and veterinary drugs established by the Codex Alimentarius Commission (CAC)

7.1 Heavy metals

The products covered by this standard shall comply with the maximum limits in Table 5

Table 5 — Limits for heavy metal contaminants for Provolone cheese

SL No	Heavy metal	MRL (Max.)	Test method
i).	Arsenic (AS)	0.1 mg/kg	AOAC 942.17
ii).	Lead (PH)	0.02 mg/kg	AOAC 972.25 / KS ISO 6733
iii).	Mercury (Hg)	1.0 mg/kg	AOAC 999.10
iv).	Copper (Cu)	5.0 mg/kg	AOAC972.25 / KS ISO 5738
v).	Zinc (Zn)	50 mg/kg	AOAC 999.10
vi).	Tin (Sn)	250 mg/kg	AOAC 999.10
vii).	Cadmium as Cd,	1.5 mg/kg	AOAC 999.10
viii).	Iron (fe),	0.5 mg/kg	AOAC 999.11/ KS ISO 6732

7.2 Pesticide residues

In addition to the maximum limits in table 5 below; the products covered by the provisions of this standard shall conform to those maximum limits for pesticides established by the Codex Alimentarius Commission for these products in codex Stan 193;

Table 6- maximum pesticide residue limits for Provolone cheese

S/N	Parameter	Requirements	Test method
<i>i</i>	ORGANOCHLORINE Group	0.01 ppm	KS ISO 3890- 1:2009 OR AOAC 970.52
<i>ii</i>	ORGANOPHOSPHOROUS Group	0.01 ppm	AOAC 970.52

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7.3 Mycotoxin residues

Provolone cheese shall not have more than 0.05ppb aflatoxin m1 content when tested according to KS ISO 14501:2007/ AOAC 974.17 and AOAC 980.21 , Aflatoxin M1 in milk and cheese-thin layer chromatographic methods

7.4 Total Antibiotic residues

Provolone cheese shall not have more than 10.0 ppb total antibiotic residues as (beta lactam) content when tested according to AOAC 982.14, 15, 16, 17 and18 and AOAC 962.14, Beta-lactam Antibiotics in milk

7.5 Veterinary Drug Residues

In addition to the maximum limits in table 6 below; the products covered by the provisions of this standard shall conform to those maximum limits for veterinary drug residue limits established by the Codex Alimentarius Commission for these products in codex Stan 193;

Table 7- maximum veterinary drug residue Limits for Provolone cheese

S/N	Parameter	Requirements/ MRL	Test method
<i>i</i>	ChloramPhenical	ND	AOAC 972.17
<i>ii</i>	Nitrofunas(including metabolites)	ND	AOAC
	Ronidazole	ND	AOAC
	Metronidazole	ND	AOAC 991.17
	Fenbendazole	100ppb	AOAC 991.17
	Albendazole	100ppb	AOAC 991.17
	Phenylbutazone	ND	AOAC 991.17

8 PACKAGING AND LABELLING

8.1 Packaging

The product shall be packed in food grade material that ensures product safety and integrity.

8.2 Labelling

In addition to the provisions of the General Standard for the Labelling of Prepackaged Foods; KS EAS 38 and the General Standard for the Use of Dairy Terms (CODEX STAN 206-1999), the following specific provisions apply:

8.2.1 Name of the food

The name Provolone may be applied in accordance with KS EAS 38, provided that the product is in conformity with this standard.

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 KS 28, General standard for cheese shall apply.

The designation of Provolone in which the fat content is below or above the reference range but above the absolute minimum specified in section 4.3 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).

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

8.2.2 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 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 labeling.

8.2.3 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.

8.2.3 Nutrient Declaration

Nutritional claim shall be made in accordance with the Guidelines for the Use of Nutritional Claims (CAC/GL 23-1997)

8.2.4 Date marking:

- i) Date of manufacture
- ii) Expiry date,
- ii) Storage instructions and / or conditions

8.2.5 Name and address of manufacturer

8.2.6 Net weight content

8.2.7 Brand name of the product

8.2.8 Batch or code number

8.2.9 Labelling of non-retail containers

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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.

9 Methods of Analysis and Sampling

The methods of sampling and analysis shall be those provided in the normative references listed in Clause 2 of this standard.

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**ANNEX A
(Normative)****Ripening procedure**

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.

**ANNEX B
(Informative)****ADDITIONAL INFORMATION**

The additional information below does not affect the provisions in the preceding sections which are those that are essential to the product identity, the use of the name of the food and the safety of the food.

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.

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