KENYA STANDARD

KS 28-2 2009
ICS 67.100.30

Cheese — Specification

Part 2:

Cheddar

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Kenya Dairy Board
Ministry Of Health — Public Health Department
Ministry of Agriculture, Livestock and Fisheries — State Department of Livestock
Government Chemist's Department
Egerton University — Department of Dairy and Food Science Technology
Kenya Industrial Research and Development Institute (KIRDI)
Consumer Information Network
Sameer Agriculture and Livestock (K) Limited
New Kenya Cooperative Creameries (NKCC)
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Foreword

This Kenya Standard was prepared by the Milk and Milk Products Technical Committee under the guidance of the Standards Projects 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 Part 2 of this Kenya Standard specifies the requirements for the type of hard cheese being marketed in Kenya as cheddar cheese.

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Cheese — Specification

Part 2:

Cheddar cheese

1 Scope

The Kenya Standard prescribes the requirements for cheddar cheese for direct human consumption or for further processing.

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.

KS 28-1:2009, *Cheese — Specification — Part 1: General requirements*

KS 660, *Guide to the safe use food additives*

KS EAS 69, Pasteurized milk- Specification

KS 35, Specification for dairy cream for direct consumption

KS EAS 38, *Labelling of pre-packaged foods*

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 CODEX STAN 193, Codex general standard for contaminants and toxins in foods

KS ISO 707, Milk and milk products — Guidance on sampling

KS ISO 5943, *Cheese and processed cheese products — Determination of chloride content — Potentiometric titration method*

KS ISO 9233, *Cheese and cheese rind — Determination of natamycin content — Method by molecular absorption spectrometry and by high-performance liquid chromatography*

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 3433, Cheese — Determination of fat content — Van Gulik method

KS ISO 5534, Cheese and processed cheese — Determination of the total solids content (Reference method)

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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 14501:2007 Milk and milk powder - Determination of aflatoxin M content - Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography

KS 2194:2009 – Good Manufacturing practice guide lines and the Dairy

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

3 Product description

Cheddar is a ripened hard cheese. The body has a near white or ivory through to light yellow or orange colour and when sampled 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°C - 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.

4 Essential composition and quality factors

4.1 Raw materials

Cows´ milk complying with relevant Kenya standard, or their mixtures, and products obtained from these milks.

4.2 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; substitute complying with KS CODEX STAN 150;

— Potable water; complying with KS EAS 12

— Safe and suitable enzymes to enhance the ripening process;

[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 Annex to the KS 28-1:2009.

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— Safe and suitable processing aids

— Rice, corn and potato flours and starches: Notwithstanding the provisions in 28-1:2009, 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 Composition

Table 1

Milk constituent:	**Minimum content (m/m):**	**Maximum content (m/m):**	**Reference level (m/m):**	**Test Method**
Milkfat in dry matter:	22 %	Not restricted	48 % to 60 %	KS ISO 1735
Dry matter:	Depending on the fat in dry matter content, according to the table below.			KS ISO 5534 or KS ISO 3433
	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 CODEX STAN 206.

5. Hygiene Requirements

5.1 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 2194:2009 and other relevant Kenya standards and regulations. The products should comply with any microbiological criteria established in accordance with KS CAC/GL 21

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

Table 2 — Microbiological requirements for cheddar cheese

S/N	**Quality**	**Requirements**	**Test method**
	Total plate count /g	*2 x 10^4 cfu per gram*	KS ISO 4833
	Listeria monocytogenes *max,*	*Nil per gram*	*KS ISO 4833*
	Salmonella spp	*Nil per gram*	*KS ISO 4833*
	Shigella	*Nil per gram*	*KS ISO 4833 KS ISO 21567*
	Clostridium botulinum	*Nil per gram*	*KS ISO 4833*
	Staphylococcus aureus	*Nil per gram*	*KS ISO 4833*

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	E.coli	*Nil per gram*	*KS ISO 4833*
	Faecal coliforms:, max	*Nil per gram*	*KS ISO 4832*
	Non-faecal coliforms, max	*10 per gram*	*KS ISO 4832*
	Mould, max	*100 per gram*	*KS ISO 6611*
	Yeast, max	*100 per gram*	*KS ISO 6611*

6 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.

Table 2

	Justified use:	
Additive functional class:	**Cheese mass**	**Surface/rind treatment**
Colours:	X1	—
Bleaching agents:	—	—
Acids:	—	—
Acidity regulators:	X	—
Stabilizers:	—	—
Thickeners:	—	—
Emulsifiers:	—	—
Antioxidants:	—	—
Preservatives:	X	X
Foaming agents:	—	—
Anti-caking agents:	—	X2

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	1000 mg/kg based on sorbic acid. Surface

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201	Sodium sorbate	Treatment only [a)].
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 [a)]
251	Sodium nitrate	37 mg/kg Singly or in combination (expressed as nitrate ion)
252	Potassium nitrate	
280	Propionic acid	3000 mg/kg Surface treatment only [a)]
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	10000 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	
[a)] For the definition of cheese surface and rind see Annex to KS 28-1:2008.		

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 below;

Table 5 — Limits for heavy metal contaminants for Cheddar cheese

SL No	Characteristic	MRL (Max.)	Test method
i).	Arsenic (AS) mg/kg	0.1 ppm	*AOAC 942.17*
ii).	Lead (PH) mg/kg	0.02 ppm	AOAC 999.10

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iii).	Mercury (Hg) mg/kg	1.0 ppm	AOAC 999.10
iv).	Copper (Cu) mg/kg	5.0 ppm	AOAC 999.10
v).	Zinc (Zn) mg/kg	50 ppm	AOAC 999.10
vi).	Tin (Sn)mg/kg	250 ppm	AOAC 999.10
vii).	Cadmium as Cd, mg/kg	1.5 ppm	AOAC 999.10
viii).	Iron	0.5 ppm	AOAC 999.10

7.2 Pesticide residues

Cheddar cheese shall have the maximum residue limits in table 6

Table 6 - maximum pesticide residue Limits for Cheddar cheese

S/N	Parameter	Requirements	Test method
i	Organochlorine group	0.01 ppm	KS ISO 3890-2:2009
ii	Organophosphorous group	0.01 ppm	KS ISO 3890-2:2009

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

7.3 Mycotoxin residues

Cheddar cheeses shall not have more than 0.5ppb aflatoxin m1 content when tested according to KS ISO 14501:2007/ AOAC 980.21, Aflatoxin M1 in milk and cheese- thin layer chromatographic method

7.4 Total Antibiotic residues

Cheddar cheeses shall not have more than 10.0 ppb total antibiotic residues as (beta lactam) content when tested according to AOAC 962.16, Beta-lactam Antibiotics in milk

7.5 Veterinary Drug residues

Table7 — Limits for veterinary drug residues for Cheddar cheese

S/N	Parameter	Requirements/ MRL	Test method
i	ChloramPhenical	*ND*	*AOAC 972.17*
ii	Nitrofunas(including metabolites)	*ND*	*AOAC 960.63*
	Ronidazole	ND	*AOAC 969.56*
	Metronidazole	ND	*AOAC 991.17*

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	Fenbendazole	100ppb	*AOAC 991.17*
	Albendazole	100ppb	*AOAC 991.17*
	Phenylbutazone	ND	*AOAC 991.17*

8 PACKAGING AND LABELLING

8.1 Packaging

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

8.2 Labelling

In addition to the provisions of KS EAS 38, the following specific provisions apply:

8.2.1 Name of the food

The name cheddar may be applied in accordance with KS EAS 38, provided that the product is in compliance 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 KS 28-1:2009 apply.

The designation of products in which the fat content is below or above the reference range but above the absolute minimum specified in 4.3 of this standard shall be accompanied by an appropriate qualification describing the modification made or the fat content expressed as as percentage by mass,, 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 KS 28-1:2009.

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[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.

8.2.3 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.

8.2.4 Date marking:

i) Date of manufacture

ii) Expiry date;

ii) Storage instructions and / or conditions

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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

Information specified in Clause 8.2 of this standard and provisions of KS EAS 38 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.

9 Methods of sampling and analysis

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
(informative)

Information on usual patterns of manufacturing cheddar

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

A.1 Method of manufacture

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

A.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.

A.2 Method of coagulation

Rennet or other suitable coagulating enzymes shall be used.

A.3 Heat treatment of the milk

Milk for cheese-making shall be heat treated, pasteurized to 72 ºC for 15 s, or 65 ºC and retained for 30 min.

A.4 Fermentation procedure

It is recommended that suitable lactic starter culture shall be added to the milk before rennettng

A.5 Maturation procedure

After scalding the curd, it is stirred until there is slight acid development; customarily 0.18 % or 0.19 %, expressed as lactic acid, is reached.

The whey is run off and the process of ‘cheddaring’ (which may take place in a separate container) continues, during which the curd is cut into blocks, which are turned and progressively piled.

During this process the curd is kept warm and the drainage of whey, together with the development of acidity, results in the curd becoming compressed smooth and elastic.the curd is milled, salted, mixed and moulded.

The cheese is stored and subsequently graded. The cheese may mature in store for 3 months to 12 months according to temperature of the store and degree of maturity required.

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