

# **Emmental cheese — Specification**

## **TECHNICAL COMMITTEE REPRESENTATION**

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

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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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## **Emmental cheese — Specification**

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## 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 hard ripened cheese being marketed in Kenya as Emmentale 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.

This standard cancels and replaces KS 28-2:2015, Emmental Cheese — Specification which has been technically revised.

During the preparation of this standard, reference was made to the following document:

CXS 269:1967, Standard for Emmental cheese

Acknowledgement is hereby made for the assistance derived from this source

## Emmental cheese — Specification

### 1 Scope

This Kenya Standard specifies the requirements, sampling and test methods for emmental cheese intended for direct 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.

AOAC 999.10, *Official method for lead, cadmium, zinc, copper, and iron in foods Atomic Absorption Spectrophotometry after microwave digestion*

CAC/GL 21, *Principles and guidelines for the establishment and application of microbiological criteria related to foods*

KS CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

KS CODEX STAN 206, *General standard for the use of dairy terms*

KS EAS 38, *Labelling of prepackaged foods — General requirements*

KS EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

KS EAS 12, *Potable water — Specification*

KS EAS 805, *Use of Nutrition and health claims — Requirements*

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

KS 229, *Edible salt — Specification*

KS 1552, *Code of hygienic practice for milk and milk products*

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 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms-colony-count technique*

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

KS ISO 5538, *Milk and milk products — Sampling — Inspection by attributes*

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KS ISO 6785, *Milk and milk products — Detection of Salmonella spp*

KS ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp*

KS ISO 6888-1, *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 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

KS ISO 11290-2, *Microbiology of the food chain — Horizontal method for the detection and enumeration of Listeria monocytogenes and of Listeria spp. — Part 2: Enumeration method*

KS ISO 14501, *Milk and milk powder — Determination of aflatoxin M content — Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography*

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

## 3 Description

Emmental is a ripened hard cheese in conformity with the General Standard for Cheese (KS 28-1). 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.

## 4 Essential composition and quality factors

### 4.1 Raw materials

Cows' milk or buffaloes' milk, 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 micro-organisms;
- Rennet or other safe and suitable coagulating enzymes;
- Sodium chloride and potassium chloride as a salt substitute; Complying with KS 229
- 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 processing aids;
- Potable water; complying with KS EAS 12
- 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 (KS 28-1), 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 Emmental cheese**

Milk constituent	Minimum content (m/m)	Maximum content (m/m)	Reference level (m/m)	Test method
Milkfat in dry matter:	45%	Not restricted	45% to 55%	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)		
	or above 45% but less than 50%:	60%		
	Equal to or above 50% but less than 60%:	62%		
	Equal to or above 60%:	67%		
Salt % Max	3%			KS ISO 5943 or AOAC 975.20
Propionic acid in cheese ready for sale(a):	minimum 150 mg/100g			ISO 19046-2
Calcium content(a):	minimum 800 mg/100g			Test method

(a) 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.

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(b) 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 General Standard for the Use of Dairy Terms (CODEX STAN 206-1999).

### 5 Food additives

Food additives may be added in Emmental cheese in accordance with CODEX STAN 192.

### 6 Hygiene

**6.1** It is recommended that Emmental cheese shall be prepared and handled in accordance with the appropriate sections of KS EAS 39, KS 1552 and other relevant standards such as codes of hygienic practice and codes of practice. The products shall comply with the microbiological criteria established in accordance with the CAC/GL 21.

**6.2** Emmental cheese shall also comply with the microbiological requirements given in Table 4 when tested in accordance with the test methods prescribed therein.

**Table 4 — Microbiological requirements for Emmental cheese**

S/N	Microorganism	Requirement	Test method
i.	Total coliforms, cfu/g, max.	100	KS ISO 4832
ii.	<i>Listeria monocytogenes</i> , cfu/25 g	Not detected	KS ISO 11290-2
iii.	<i>Salmonella spp.</i> cfu/25 g	Not Detected	KS ISO 6785
iv.	<i>Staphylococcus aureus</i> , cfu/g	Absent	KS ISO 6888-1
v.	<i>Escherichia coli</i> , cfu/g	Absent	KS ISO 7251

### 7 Contaminants

Emmental cheese shall comply with the maximum levels for contaminants that are specified for the product in KS CODEX STAN 193.

#### 7.1 Heavy metals

When tested in accordance with AOAC 999.10, the level of lead (Pb) in Emmental cheese shall not exceed 0.02 mg/kg.

#### 7.2 Pesticide residues

Emmental cheese shall comply with the maximum limits for pesticide residues set by Codex Alimentarius Commission.

#### 7.3 Mycotoxin residues

When tested in accordance with KS ISO 14501, the level of Aflatoxin M1 in EMMENTAL cheese shall not exceed 0.50 µg/kg.

#### 7.4 Veterinary drugs residues

EMMENTAL cheese shall comply with the maximum tolerable residue limits for antibiotics and other veterinary drugs set by Codex Alimentarius Commission.

### 8 Packaging



EMMENTAL cheese shall be packaged in food grade material that ensures product safety and integrity.

## 9 Labelling

In addition to the provisions of KS EAS 38 and KS CODEX STAN 206, the following specific provisions apply.

### 9.1 Name of the food

The names Emmental or Emmentaler may be applied in accordance with General Standard for the Labelling of Prepackaged Foods (KS EAS 38), 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 (KS 28-1) 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 KS (CXS 283-1978) or a nutritional claim in accordance with the Guidelines for Use of Nutrition and Health Claims (KS CXG 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.

### 9.2 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 (see note) 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.

### 9.3 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.

### 9.4 Name and address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the food shall be declared.

### 9.5 Net contents

The net contents shall be declared by weight in either the metric ("Système International" units) or as required by the country in which the product is sold.

### 9.6 List of ingredients

A complete list of ingredients shall be declared on the label in descending order of proportion.

### 9.7 Storage instructions or conditions for use.

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**9.8 Date of manufacture.**

**9.9 Expiry date.**

**9.10 Batch code/number or lot identification**

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.

## **10 Sampling**

Sampling shall be carried out in accordance with KS ISO 707 and KS ISO 5538.

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## **Annex A**

(normative)

### **A.1 Ripening procedure**

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.

### **A.2 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 the coagulation temperature.

**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.

**B.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

**B.2 Method of manufacture**

Fermentation procedure: Microbiologically derived acid development.