

**Fermented sausages (*salami*) —  
Specification**

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Kenya Industrial Research and Development Institute  
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Government Chemist’s Department  
Food Science and Technology Platform Kenya  
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# Fermented sausages (*salami*) — Specification

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## Foreword

This Kenya Standard was prepared by the Meat and Poultry 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.

Fermented sausages commonly referred to as salamis are a type of cured sausage meat consisting of fermented and air-dried meat, typically beef or pork, other meats can also be used for processing the product. As an emerging product, fermented sausages are currently being produced and marketed in Kenya. However, there is no national standard to regulate their quality and safety and hence the preparation of this first edition of the standard.

The standard specifies methods of sampling and analysis that enhance maintenance of quality and safety of fermented sausages.

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

The Food, Drugs and Chemical Substances Act, Cap 254 of the Laws of Kenya.

International Commission on Microbiological Specifications for Foods - Micro-organisms in Foods, Book 8.

Acknowledgement is hereby made for the assistance derived from these sources.



## Fermented sausages (*salami*) — Specification

### 1 Scope

This Kenya Standard specifies the quality and safety requirements, sampling and test methods for fermented sausages.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AOAC 971.21, *Mercury in food by flame atomic absorption spectroscopy (FAAS)*

AOAC 986.15, *Arsenic, cadmium, lead, selenium, and zinc in human and pet foods by atomic absorption spectrometry (AAS) and anodic stripping voltammetry (ASV)*

AOAC 999.10, *Lead, cadmium, zinc, copper, and iron in foods by glass furnace atomic absorption spectroscopy (GFAAS) and by flame atomic absorption spectroscopy (FAAS)*

CAC/MRL 2, *Maximum residue limits for veterinary drugs in food*

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 10272-2, *Microbiology of the food chain — Horizontal method for detection and enumeration of Campylobacter spp. — Part 2: Colony-count technique*

KS ISO 11290-1, *Microbiology of the food chain — Horizontal method for the detection and enumeration of Listeria monocytogenes and of Listeria spp. — Part 1: Detection method*

KS ISO/TS 13136:2012 *Microbiology of food and animal feed — Real-time polymerase chain reaction (PCR)-based method for the detection of food-borne pathogens — Horizontal method for the detection of Shiga toxin-producing Escherichia coli (STEC) and the determination of O157, O111, O26, O103 and O145 serogroups*

KS CAC/RCP 68, *Code of Practice for the Reduction of Contamination of Food with Polycyclic Aromatic Hydrocarbons (PAH) from Smoking and Direct Drying Processes*

KS CODEX STAN 192, *General standard for food additives*

KS EAS 12, *Potable water — Specification*

KS EAS 35, *Edible salt — Specification*

KS EAS 38, *Labelling of pre-packaged foods — General requirements*

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

KS EAS 321, *Edible fats and oils — Specification*

KS 166, *Methods for the chemical analysis of meat and meat products*

KS 2761, *Meat hygiene — Code of practice*

KS 2763, *Meat speciation — Test method*

### **3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

#### **3.1**

##### **meat**

all parts of an animal that are intended for and have been judged as safe and suitable for human consumption

#### **3.2**

##### **fermentation**

the anaerobic breakdown of sugar into lactic acid (by microorganisms in the starter culture) within the batter, which lowers the pH of the batter

#### **3.3**

##### **starter culture**

a commercial preparation of microorganisms for fermenting the batter. Shelf stable means food that has been processed so that it can be safely stored at room temperature for a period of time

#### **3.4**

##### **batter mix**

all the ingredients in a recipe that have been combined prior to filling a casing

#### **3.5**

##### **ready-to-eat**

products that are intended to be consumed without any further biocidal steps.

#### **3.6**

##### **salami**

meat such as livestock and poultry that are minced or crushed, added with salt or starter, and then filled into casings, have stable microbial characteristics and typical fermented aromas after fermentation, drying, and ripening.

#### **3.7**

##### **food animal**

animals declared as such under the laws of Kenya

#### **3.8**

##### **smoking**



the process of flavoring browning, cooking, or preserving food by exposing it to smoke from burning or smoldering material, most often wood

### **3.9**

#### **Fermented sausages (Ready-to-eat)**

Sausages used fresh or frozen livestock and poultry meats as their main raw materials together with other ingredients, that have undergone mixing, seasoning, dicing, stranding/chopping, filling, curing or not, microbial fermentation, drying, ripening, molding or not, smoking or not, slicing or not, packaging and other processing technologies are processed into ready-to-eat meat products.

## **4 Requirements**

### **4.1 General requirements**

**4.1.1** Fermented sausage meat shall be derived from food animals slaughtered in a hygienically managed slaughter-house and subjected to ante-mortem and post-mortem examination according to the procedure prescribed in KS 2761.

**4.1.2** The meat from which the product is prepared shall be of a quality suitable for human consumption free from objectionable odours, foreign matter and discoloration.

**4.1.3** The product shall be prepared, handled and delivered under hygienic conditions.

**4.1.4** The product shall be prepared in a facility which is complying with KS EAS 39.

### **4.2 Raw materials requirements**

**4.2.1** Meat shall be derived from animals slaughtered in a hygienically managed slaughter house complying with KS 2761.

**4.2.2** Curing agents complying with the Food, Drugs and Chemical Substances Act, Cap. 254 of the Laws of Kenya.

**4.2.3** Food additives used in fermented sausages shall be complying with the Food, Drugs and Chemical Substances Act, Cap. 254 of the Laws of Kenya and KS CODEX STAN 192.

**4.2.4** Fats complying with KS EAS 321.

**4.2.5** Salt complying with KS EAS 35.

**4.2.6** Food grade sausage casing and starter culture complying with relevant Kenya Standards.

### **4.3 Optional ingredients**

All optional ingredients used shall be of food grade quality and conform to applicable Kenya Standards.

**4.3.1** Sucrose, invert sugar, dextrose (glucose), lactose, maltose, glucose syrup (including corn syrup).

**4.3.2** Spices, seasonings and condiments complying with respective Kenya Standards.

**4.3.3** Where smoke is used, precaution should be taken in compliance with KS CAC/RCP 68.

#### 4.4 Sensory and quality requirements

Fermented sausages(ready-to-eat) shall meet the following quality requirements:

1. for products in whole pieces, their casings will not be damaged and will be adhered to the filling;
2. that filling on the cross-section has the appearance of a mosaic of roughly uniform pieces of meat and fat tissue, which are evenly distributed.
3. there are no cavities and cracks on the section;
4. have a stable colour and a pleasant and characteristic smell and taste;
5. have the characteristic consistency except in spreadable fermented sausage
6. The final product shall have the characteristic smell and taste that the fermented sausages should have and free from staining and contamination from the container.

## 5 Compositional requirements

Fermented sausages and sausage meat shall comply with the compositional and quality requirements given in Table 1 when tested in accordance with the methods given therein.

**Table 1 — Compositional requirements for fermented sausages**

S/N	Characteristic	Raw/sausage meat	Semi dry and dry fermented salami	Test method
		Limit for the final products (% m/m)	Limit for the final products (% m/m)	
i.	Total meat content, min.	52	52	KS 166
ii.	Moisture content, max.	65	<b>65</b>	
iii.	Fat content, max.	30	<b>60</b>	
iv.	Total ash, (max.) on dry weight	3	<b>6</b>	

## 6 Hygienic requirements

**6.1** The processing of raw-fermented sausages is dominated by biological and biochemical processes and raw meat materials of excellent hygienic quality are a precondition for the correct functioning of such processes.

**6.2** Raw-fermented sausages shall be prepared, handled and stored in accordance with the appropriate sections of KS EAS 39 and KS 2761.

**6.3** All workers shall use appropriate personal protective equipment that does not contaminate the product.

**6.4** All workers shall undergo a food handlers test before their deployment and every so often as per the Public Health Act, Cap. 242 of the Laws of Kenya and Food, Drugs and Chemical Substances Act, Cap. 254 of the Laws of Kenya.

**6.5** Necessary precautions shall be taken to prevent incidental contamination of the product from soiled and/or dirty equipment or from persons suffering from injuries.

**6.6** All equipment coming into contact with raw material or product in the course of manufacture shall be kept clean.

**6.7** Adequate supply of running potable water that complies with KS EAS 12 and/or steam/boiling water, brushes, and other equipment necessary for proper cleaning of machinery/equipment shall be available.

**6.8** The equipment shall be cleaned, sanitized and/or disinfected using an appropriate food grade agent or with hot water at a temperature above 82 °C.

## 7 Sampling

The sampling of the fermented sausages shall be in accordance to CAC/GL 50 General guidelines on sampling

### Microbiological limits

Fermented sausages shall not contain any pathogenic organisms and shall comply with microbiological limits given in Table 2 when tested in accordance with the methods given therein.

**Table 2 — Microbiological limits for fermented sausages**

S/N	Type of organism	Limit, max.	Test method
	<b>Hygiene parameters</b>		
i.	Coagulase positive <i>Staphylococcus aureus</i>	≤ 20 cfu/g	KS ISO 6888-1
	<b>Food safety parameters</b>		
ii.	<i>Escherichia coli</i> 0157:H7	Absent in 25 g	ISO/TS 13136
iii.	<i>Salmonella</i> spp	Absent in 25 g	KS ISO 6579-1
iv.	<i>Listeria monocytogenes</i>	Absent in 25 g	KS ISO 11290-1
v.	Campylobacter <sup>a</sup>	Absent in 25 g	KS ISO 10272-2
<sup>a</sup> For poultry products.			

## 8 Meat identification

The identification/isolation of meat used in fermented sausages shall be done according to the Polymerase Chain Reaction test as per KS 2763 or any other validated test method.

## 9 Pesticides and Veterinary drug residues

### 9.1 Veterinary drug residues

The products covered by this standard shall comply with the maximum residue limits specified in CAC/MRL 2.

### 9.2 Pesticide residues

Fermented sausages shall comply with the maximum residue limits set by Codex Alimentarius Commission.

## 10 Heavy metal contaminants

Fermented sausages shall not contain heavy metal contaminants in excess of the limits given in Table 3 when tested in accordance with the methods given therein.

**Table 3 — Limits for heavy metal contaminants in fermented sausages**

S/N	Heavy metal	Maximum limit, ppm	Test method
i.	Arsenic (As)	0.1	AOAC 986.15
ii.	Lead (Pb)	0.1	AOAC 999.10
iii.	Cadmium (Cd)	0.05	AOAC 986.15
iv.	Mercury (Hg)	0.03	AOAC 971.21

NOTE Where a risk assessment indicated the possibility of occurrence of other heavy metal contaminants not listed, then the product shall be tested.

## 11 Packaging

**11.1** Packaging of fermented sausages shall be done in food grade packaging materials that protect the product from any physical, microbiological, chemical or any other type of contamination during storage and distribution.

**11.2** The packages shall be able to withstand the rigors of handling and transportation and shall not be exposed to direct sun or rain.

## 12 Labelling

Labelling of fermented sausages shall be done in accordance with the requirements stipulated in KS EAS 38, and shall include the following:

- a) description /name of the product (type of meat or meats used) as appropriate;
- b) list of ingredients in descending order;
- c) nutritional information;
- d) allergens declaration;
- e) name, location and address of manufacturer;
- f) net weight, in g or kg;
- g) declaration as “fermented” and “ready to eat”;
- h) date of production/manufacture;

- i) expiry date;
- j) batch number;
- k) instructions for use;
- l) storage conditions and temperature of storage; and
- m) country of origin or “Made in Kenya” for locally manufactured products.

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