KENYA STANDARD

DKS 1552: 2015
ICS 65.060

Code of hygienic practice for milk and milk products

TECHNICAL COMMITTEE REPRESENTATION

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Kenya Dairy Board- Chair
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Ministry of Agriculture, Livestock and Fisheries — State Department of Livestock
Department of Veterinary Services
Egerton University — Department of Dairy and Food Science Technology
Government Chemist's Department
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Nestle Foods

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Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast of progress in 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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FOREWORD

This code of practice 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 Kenya Bureau of Standards.

Milk and Milk products are an essential dietary component in almost every Kenyan household. It is therefore important to promote hygienic practices in the production, handling, processing and distribution of milk and milk products in the interest of protecting public health.

Milk production in Kenya is largely undertaken by small-scale producers who generally lack appropriate skills, knowledge and information on clean milk production and handling. The dairy value chain also has a multiplicity of other stakeholders who are engaged in transportation, bulking, processing, marketing and distribution of milk and milk products. Good hygienic practices at each of these levels are required to ensure the safety and quality of milk and milk products. Informal marketing of milk in Kenya is also significant; therefore, any transformation measures on this marketing channel cannot be complete without improving on the milk handling practices

This code therefore aims at providing guidelines for the hygienic production, bulking, handling, processing and distribution of milk and milk products. This will enhance compliance to Kenyan standards for milk and milk products, promote consumer protection and enhance market access for Kenyan milk and milk products.

In the preparation of this code of practice, reference was made to the following documents:

- CAC/RCP 57-2004 Code of hygienic practice for milk and milk products
- KS 05-1500:1998 Code of practice in the food and drink manufacturing industry
- CAC/RCP1 1969 Rev 3, 1997 General Principles of food hygiene

KENYA STANDARD

Code of hygienic practice for Milk and Milk products

1. SCOPE

This code prescribes the requirements for hygienic practice for production,, processing, handling bulking and distribution of milk and milk products.

2. APPLICATION

2.1 The code shall apply to raw milk and processed milk and milk products.

3. Normative references

The following referenced documents are indispensable for the application 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.

Ks EAS 38, *Standard Specification for Labelling of Pre-packaged Foods*

KS EAS 39, *Code of practice for hygiene in the food and drink manufacturing industry*

General Requirements for Establishing a Hazard Analysis Critical Control Point (HACCP) Programme for Food Processing Establishments

KS EAS 12, *Standard Specifications for Drinking (Potable) Water*

(CAC/GL 69-2008); Food Hygiene Control Measures

(CAC/RCP 1-1969); General Principles of Food Hygiene

KS 05-37: 1997 Code of hygienic practices in the dairy industry for milk carriers

4. DEFINITIONS

For the purposes of this standard the following definitions shall apply:

4.1

Appliances

the whole or any part of any utensil, machinery, instrument, apparatus, or article, used or intended for use in or for production, processing, storing, selling or supplying of milk or milk products

4.2

asceptic processing

Shall be a heating and direct fill packaging process which can be verified to assure that the product being processed is commercially sterile and will maintain commercial sterility under non refrigerated conditions

4.3

Bulk dispensing

It is the automatic vending of processed but unpackaged milk and milk products from a dispenser upon insertion of a coin or token or by other similar means without the necessity of replenishing the device between each vending operation

4.4

Cleaning

The removal of soil, food residue, dirt, grease or other objectionable matter

4.5

Contaminant

Any biological or chemical agent, foreign matter, or other substances not intentionally added to food which may compromise food safety or suitability

4.6

Contamination

The introduction or occurrence of a contaminant in food or food environment

4.7

Disinfection

The reduction, by means of chemical agents and/or physical methods, of the number of micro-organisms in the environment, to a level that does not compromise food safety or suitability

4.8

End product

Food that is ready for sale.

4.9

Equivalent sanitary measure

different sanitary measures which, when properly applied, result in end products which meet the same level of public health protection as the prescribed or conventional sanitary measure.

4.10

Establishment

Any building or area in which food is handled and the surroundings under the control of the same management

4.11

Food hygiene

All conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain

4.12

Food handler

Any person who directly handles packaged or unpackaged food, food equipment and utensils, or food contact surfaces and is therefore expected to comply with food hygiene requirements

4.13

Food safety

Assurance that food shall not cause harm to the consumer when it is prepared and/or eaten according to its intended use

4.14 Food suitability

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.

4.15

Hazard

A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect

4.16

Hazard Analysis Critical Control Point (HACCP)

A system, which identifies, evaluates, and controls hazards which are significant for food safety

4.17

Milk products

Shall be conventional milk products to which other non-milk products or additives have been added and foods to which milk has been added to form a major ingredient e.g, flavoured milks, cheese with added foods, milk porridge, milk bread, milk foods with additives, malted milk, milk chocolate, milk candies, sweetened dried milk, ice-cream, etc.

4.18

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.

4.19

Milk retail centre

This is an establishment licensed to procure, prepare and sell processed milk and milk products in small quantities directly to consumers and include milk bars

4.20

Milk collection/bulking centres

These are licensed establishments strategically located in milk production areas to collect raw milk from milk producers for the purpose of bulking, cooling and bulk marketing or delivery to milk processing plants. They can be operated by milk producer groups, processors, private entrepreneurs and government.

4.21

Micro-organisms

Any microscopic living organism that can cause disease or food spoilage

4.22

Pasteurization

This is a heat treatment process applied to a product with the object of eliminating possible health hazards arising from pathogenic micro-organism associated with milk by heat treatment which is consistent with minimal chemical, physical and organoleptic changes in the product

NOTE: The recommended methods of Pasteurization are:

a. **Batch Method** — The temperature of milk shall be raised to not more than 72 °C and not less than 65 °C and retained within this range for 30 min and immediately and rapidly cooled to 10 °C or less.

b. **High Temperature Short Time Method** — the temperature of milk shall be raised to not less than 72 °C retained at this temperature for 15 s and immediately and rapidly cooled to 10 °C or less.

4.23

Potable water

Safe and clean Water, which shall comply with KS EAS 12, *Standard Specifications for potable (Drinking) water*

4.24

Primary production

Those activities involved in milk production up to and including milking

4.25
Public health protection
Shall be control measures aimed at protecting the consumer from any health hazard caused by the milk and milk products.

4.26
Raw milk
Shall be the normal, clean and fresh mammary gland secretion of healthy milking animals, free from colostrum, without addition to or extraction from it, and is suitable for further processing.

4.27
A reconstituted milk product

A product resulting from the addition of water to the dried or concentrated form of the milk product in the amount necessary to re-establish the appropriate water to solids ratio.

4.28
A recombined milk product

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.

4.29

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

4.30

Stable

Shall be the premises where the milk animals are accommodated.

4.31

Sterilization

Shall be a heat treatment aimed at producing a commercially sterile product which can be stored at room temperature. The process aims to destroy all micro-organisms, any residual micro-organisms are unlikely to cause spoilage under normal storage conditions. Sterilization is an in-container, batch wise heating process using minimum temperature/time conditions to achieve Fo value of 3.

4.32
Ultra high temperature (UHT)

Shall be a high-temperature/short-time heat treatment of milk or cream aimed at producing a commercially sterile product which can be stored at room temperature. The process aims at destroying all micro-organisms; any residual micro-organisms are unlikely to cause spoilage under normal storage conditions. UHT treated milk or cream is packed asceptically into sterilized, hermetically sealed containers. The total heat treatment is equivalent, in terms of its effectiveness against heat-resistant bacterial spores to a minimum F^{o} value of 3

.**4.33**

Relevant authority

The Ministry, Government department, agency or other officially recognized institution mandated to carry the specified function

4.34

Utensil

Any appliance, container and equipment including traditional types used in the processing, storage and sale of milk and milk products

4.35

Waste water

Effluent water arising as a result of the activity of milk and milk products handling

4.36

Water container

Any form of food grade container which is used solely for the purpose of storing and serving water and has not been used previously for any other purposes which could cause contamination of the water stored in it

4. GENERAL PRINCIPLES APPLICABLE TO THE PRODUCTION, PROCESSING, HANDLING, BULKING AND DISTRIBUTION OF MILK AND MILK PRODUCTS

i) milk and milk products when presented to the consumer shall be safe for human consumption;

ii) Different risks are associated with different products and their end uses and this shall be considered when applying the provisions of this Code.

iii) From raw material production to the point of consumption, milk 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.

iv) Milk and milk products shall be suitable for the intended purpose; and.

v) Food hygiene control measures and control measure combinations used in the production of milk and milk products shall be validated to demonstrate that they are effective in achieving their intended purpose, including, as appropriate, the specified level of public health protection.

vi) Wherever appropriate, hygienic practices for milk and milk products should be implemented within the context of HACCP. 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

5. PRIMARY PRODUCTION

5.1 Principles applicable to the primary production of milk:

i) Milk should not contain any contaminant at a level that jeopardizes the appropriate level of public health protection, when presented to the consumer; control measures employed at the primary production level for the production of milk shall result in a safe and suitable raw material for further processing

ii) Contamination of milk from animal and environmental sources during primary production should be minimized

iii) Good manufacturing practices and good hygiene practices do apply and shall be practiced

iv) 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; .

5.2 Environmental Hygiene

5.2.1 Water — complying with KS EAS 12Specification for Potable (drinking) water.

5.2.2.1 Adequate and clean potable water shall be supplied on the farm to facilitate all hygienic practices in production of milk.

5.2.2.2 The water shall be appropriate for drinking by animals, cleaning and sanitation of equipment and utensils, and for all relevant processes on the farm.

5.2.2.3 Where safe and soft ground water is unavailable, treatment of water shall be considered essential e.g. chlorination, sedimentation, filtration etc.

5.2.2.4 Wells or boreholes shall be carefully located and constructed to prevent the seepage of surface water into the supply.

5.2.2.5 Precautions should be adopted to ensure that milk animals do not consume or have access to contaminated water likely to cause disease or contaminate milk.

5.2.2 *Waste*

5.2.2.1 Manure, fodder residues, effluent and any other wastes shall be disposed of in such a manner as to render them inaccessible to reduce fly population and the eventual bacterial contamination off-flavours and abnormal odours in milk.

Measures shall include:

(i) Removal of manure and other organic wastes from the milking establishment,

(ii) Their immediate disposal either on land or by properly controlled storage and composting

(iii) Waste water or other effluents shall be disposed of in a drain or in such a manner as to reduce its accumulation in the milking area.

5.2.2.2 Human waste shall not be deposited within the milking areas or grazing grounds. Toilets or pit latrines with doors shall be provided away from the milking areas and they shall not communicate directly into the milking or milk storage areas.

5.2.3 Dust — Dust in the immediate surroundings of milk production shall be controlled in so far as possible not to contaminate the milk.

5.3 Hygienic Production of Raw Milk

This section gives guidance for the hygienic production of raw milk destined for the manufacture of products covered by this code.

5.3.1 Premises for Milk Production

Premises used for the production of milk should be designed, Situated, maintained and used in a manner that minimizes or prevents the contamination of milk.

5.3.2 Animal health

5.3.2.1 The raw milk should originate from animals:

i) which are free from brucellosis, tuberculosis, rift valley fever and mastitis as shall be determined by a qualified veterinary officer;
ii) which are well fed, healthy and not on treatment
iii) Which do not show any evidence of infectious diseases transferable to humans through milk
iv) Which do not show visible impairment of the general state of health; and
v) Which are identifiable to facilitate effective herd management practices.

5.3.2.2 Holding area for milking animals

i). There shall be a holding area for the milking animals to preclude the presence of non-milking animals where such presence adversely affects the safety of the milk.

ii). the area should not adversely influence the health of the animals. Diseased animals should be isolated from the herd.

iii). shall be kept clean, free of accumulation of manure, mud or any other objectionable materials. Stable/stalls shall be designed and constructed so as to keep them free of accumulation of manure, feed residues and easy to clean, drain and disinfect.

iv). 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.

vi. Access to the animal holding area, including the stable and attached premises, if used, should preclude the presence of other species such as dogs, chicken, donkeys, cat etc that would adversely affect the safety of the milk.

vii). 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.

viii). Animal holding areas should be designed such that animals with contagious diseases can be separated to prevent the transmission of disease to healthy animals.

viii). 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.

5.3.2.3 Milking areas and related facilities:

Milking areas shall exclusively accommodate the milking animals.

Premises where milking is performed shall be sited and constructed in such a way as to minimise the risk of environmental contamination of the milk. The areas shall be easy to clean subject to soiling or infection, e.g., they should have:

(i) flooring shall be constructed so as to facilitate draining of liquids and adequate means of disposing of waste;

(ii) adequate ventilation and lighting;

(iii) an appropriate and adequate supply of potable water for use in milking and in cleaning the equipment and the instruments for milking;

(iv) Effective separation from all sources of contamination such as toilet facilities and manure heaps.

5.3.3 General Hygienic Practices

3.3.3.1 Feeding

Forage, feed and fodder for the milking animals shall not present a risk of transferring, directly or indirectly, pathogens ,pesticides residues, mycotoxins or other toxins, taint or any other agent used or incidental in the production of feedstuffs into the milk in amounts that present a health risk to the consumer. There shall be provisions for proper mangers (feeding troughs).

5.3.3.2 Pests control

i) Shall be effective to avoid physical and microbial contamination of milk.

ii) 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.

iii) Accumulations of manure should not be allowed to develop close to milking areas.

iv) 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 by relevant authority in food premises and used in accordance with the manufacturer's instructions.

v) 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 the use of pesticides should be in such a way that it shall not result in residues in milk.

5.2.2.3 Veterinary drugs

i) Milk from animals which have been treated with antibiotics, acaricides or other veterinary drugs which can be transferred to the milk shall not be used unless the withdrawal period specified for the drug in question following such treatment has been achieved. It is recommended that the Codex Alimentarius Guidelines for a regulatory programme for control of veterinary drug residues f in milk and milk products be used to prevent the occurrence of drug residues and to comply with maximum residue levels.

ii) Good husbandry procedures should be used to reduce the likelihood of animal disease and thus reduce the use of veterinary drugs. In addition; only those medicinal products and medicinal premixes that have been authorized by relevant authority in charge of the veterinary services for inclusion in animal feed should be used.

iii) The veterinarian and/or the livestock owner or the personnel at 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.

5.3.4 Hygienic Milking Practice

5.3.4.1 Hygienic milking

Milking should be carried out in such a manner that minimizes contamination of the milk being produced, including:

a) Animals showing clinical symptoms of diseases transferable to humans through the milk shall be segregated and/or milked last, or milked by using separate milking equipment or by hand, and such milk shall not be used for human consumption.
b) Before milking, the udder and teats of the animal shall be effectively washed and cleaned with potable water. A clean damp towel should be used to wipe the udder dry. Always use one towel per cow and do not share one towel for more than one cow.
c) Prior to milking, the milk from each teat shall be checked for visible defects including mastitis. If the milk is abnormal, it shall not be fed to humans and other domestic animals. The milk from mastitis affected teats shall be milked last and discarded in a manner that avoids contaminating other milk and/or transfer of mastitis to healthy animals.
d) Foremilk (initially drawn small quantity of milk) from each teat should be discarded or collected separately and not used for human consumption. This milk shall be drawn into receptacles provided for the purpose without soiling the hands or dropping on the floor.
e) Abnormal milk including that got during the first seven days after calving shall not be mixed with normal milk
f) During milking, appropriate precautions should be taken to minimize the risk of infections to the teats and udders, including the avoidance of damage to tissue.
g) Brushing of animals at the time of milking shall be avoided, as it is likely to raise dust in the animals shed.
h) If the animals are fed during milking, the method of feeding and the type of feed used shall not be a source of contamination to the milk.
i) The udder shall be washed with water and preferably disinfected with teat dip on completion of milking to prevent infection of the teats.
j) The milk shall immediately be stored in clean sealed containers under conditions preventing contamination and transported to the collection centre within two hours of milking. Where the milk is stored for a longer time, cooling to 10 ^{0}C and below shall be undertaken.

When milking is done by hand,

i. The milk shall be drained with dry hands. In order to prevent the practice of wet milking and to render milking easier the use of odourless petroleum jelly is recommended;
ii. The milk shall be drawn directly into the milking container as fast as possible; and

iii. The milkers shall not wipe their hands on the body of the animals or on their person. The switch of the tail shall not be touched.

5.3.4.1.1 Where milk is cooled at the farm, the farmer shall cool the milk immediately after milking

5.3.4.2 Milking equipment

5.3.4.2.1 Cleaning and disinfection

a) Milking equipment, utensils and storage containers should be thoroughly cleaned and disinfected before and after use.
b) Rinsing of equipment, utensils and storage containers following cleaning and disinfection should remove all detergents and disinfectants.
c) Water used for cleaning and rinsing shall be potable in accordance with the KS EAS 12

5.3.4.3 Personal hygiene of milking personnel

i) Milking should be carried out in such a manner that minimizes contamination of the milk being produced.

ii) Milking shall not be performed nor handled by persons known, or suspected to be suffering from, or to be a carrier of a contagious or infectious disease or illness which may be transferred through the milk; Such a person shall not take part in the milking until all danger therefrom of the communication of the infection to the milk in the opinion of a medical officer of health has ceased and a certificate issued.

iii) Hands (up to elbow) shall be washed frequently and always washed before initiating milking or handling of raw milk.

iv) Suitable clothing shall be worn during milking and shall be clean.

v) Milking personnel shall avoid smoking, spitting, chewing or eating, or any other undesirable behaviour during milking.

5.3.4 Handling, Storage and Transport of Milk

5.3.4.1 Milking Equipment and utensils

5.3.4.1.1 Milking equipment shall be designed, constructed, installed, maintained and operated in a manner that will avoid the introduction of contaminants into milk.

5.3.4.1.2 Milking equipment, when used, shall undergo periodic inspections to verify that they are in good working condition to provide appropriate service. Repairs and adjustments ordered during the inspection shall be implemented.

5.3.4.1.3 Equipment, utensils and instruments or their surfaces which are intended to come into contact with milk shall be made from food grade and approved material such as stainless steel, aluminium etc and shall 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 humans.

5.3.4.2 Storage containers

5.3.4.2.1 Milk shall suitably be contained in farm bulk tanks or milk cans. Milk storage tanks and cans shall be so designed and constructed as to avoid any contamination of the milk and to ensure complete drainage. Surfaces of milk storage tanks, cans and associated equipment intended to come in contact with milk shall comply with **5.3.4.1.3**.

5.3.4.2.2 Milk storage containers, tanks and cans shall be used to store milk only.

5.3.4.3 Premises for, and Storage of, Raw Milk and Milking-Related Equipment

The following shall be observed in the storage of milk;

a. Premises for the storage of milk shall be situated and constructed in such a manner as to avoid risk of contamination of milk or equipment.

b. Milk shall be stored in properly designed and maintained tanks or cans.

c. Storage temperature and time shall be such that deterioration and spoilage of milk does not occur.

d. Milk shall be cooled to as low a temperature as possible, preferably to 5 °C but not more than 10 °C, in a plate chiller or by immersing the cans in a tank of chilled water passing over a surface cooler and stored below 10 °C. In the event that there is no cooling facility at the farm, milk shall be delivered within two hours after milking to a cooling facility.

e. The premises shall be supplied with sufficient potable water for use in milking and in cleaning of equipment, utensils and instruments;

5.3.4.4 Collection, transport and delivery procedures and equipment

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.

5.3.4.4.1 Milk collection

5.3.4.4.1.1 All milk transported in cans shall be protected from contamination:

(i) Lids shall be firmly placed and sealed on the cans as soon as they are filled.

(ii) The lids and seals shall remain in position until the milk is received at the processing plant, cooling centre or distribution point.

5.3.4.4.1.2 Cans picked up by Lorries shall be placed in such a manner as to avoid any risk of contamination by mud, manure silage, etc.

5.3.4.4.1.3 The cans shall be protected from direct sunlight e.g. by use of shelters.

5.3.4.4.2 Handling of Milk at Collection Centres

5.3.4.4.2.1 Collection centres shall be located near roads, water supply, and drainage areas.

5.3.4.4.2.2 Milk shall be delivered to the centre within 2 hours of milking.

5.3.4.4.2.3 The control of incoming milk shall include minimum simple tests for acceptance and rejection:

(i) Organoleptic (olfactory and visual).

(ii) Density (lactometer reading).

(iii) Alcohol precipitation test or the alizarin alcohol test using minimum 68 per cent ethanol.

(iv) PH using universal indicator.

5.3.4.4.2.3 Milk shall be weighed, filtered and cooled to a temperature of 5oC or lower.

5.3.4.4.2.4 At collecting centres, cold storage facilities shall be provided where milk is not transported or collected twice a day to ensure that the milk arrive at the processing plant at a temperature of 50c

5.3.4.4.2.5 Collecting centres shall provide a drainage or sewage system and the surrounding area shall be maintained in a clean sanitary condition.

5.3.4.4.2.6 Suitable facilities shall be provided at the centre for cleaning and disinfecting of cans (or other milk carrying containers) before returning to the milk producer (farmers).

5.3.4.4.2.7 The supervisor of the centre shall have atleast a certificate in Dairy Technology or related field to effectively handle milk reception and routine hygienic procedures.

5.3.4.4.3 Milk Transport

All milk delivery vehicles shall be conspicuously inscribed with name and address of the licensed distributor or transporter.

5.3.4.4.3.1 Milk transport vessels

5.3.4.4.3.1.1 Milk transport tankers and cans shall be designed and constructed in such a manner as to avoid any contamination of the milk, and to ensure complete drainage. Surfaces of milk transport tankers, cans and associated equipment intended to come in contact with milk shall 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 humans, and shall be kept in clean conditions.

5.3.4.4.3.1.2 Milk transport tankers and cans shall be used to transport milk only

5.3.4.4.3.1.3 Where plastics are used in the transportation of milk; they shall be made from food grade materials and shall not affect the organoleptic or chemical quality of milk. It is recommended that rigid plastics; white in colour or colourless are used. The design shall comply with KS 06-536: 1985*

5.3.4.4.4.3.2 Transport time and temperature

* Specification for milk cans.

After cooling at collection centres, milk shall be transported in a manner that maintains the milk temperature below 8^{o}C.

5.3.4.4.4.3.3 Cleaning and Disinfection of transport Containers

Milk cans, transport tankers (including the raw milk discharge area) shall be cleaned and disinfected whenever necessary using approved agents, (as prescribed in general codex standard). After disinfection, tankers and cans shall be drained. Lorries, trucks or other vehicles which carry the tank shall be cleaned before loading and after emptying.

5.3.4.4.4.3.4 Milk Haulier, Tanker Driver or Individual Transporter

i) Shall be licensed according to the relevant national regulations.

ii) shall receive adequate training in the hygienic handling of milk and shall observe good personal hygiene;

5.3.4.4.4.3.5 Personal hygiene

The milk handlers;

i) Shall wear clean clothing and not have infectious or contagious diseases that would present a risk of contaminating milk;

ii) Shall perform their duties in a sanitary manner so that their activities shall not result in contamination of milk at the farm and during transport

iii) Shall not engage in practices that would lead to the contamination of milk or dairy processing areas when discharging the tanker

6. ESTABLISHMENT: DESIGN AND FACILITIES

Shall be in accordance with KS EAS 39

6.1. ESTABLISHMENT: HYGIENE REQUIREMENTS

In addition to KS EAS 39, and the Codex General Principles of Food Hygiene-CAC/RCP 1-1 the following controls shall be made:

6.1.1 Milk Control on Reception

(i) Every milk establishment, milk collection centre, distribution point or plant shall be equipped to test for quality at the first point of delivery to quickly determine the suitability of raw milk for processing.

(ii) The tests shall include the assessment of the extent of abnormalities and adulteration in the milk including water, preservatives or antibiotics that may have been added.

(iii) Every establishment shall have at least one competent person to carry out the necessary tests for quality control of incoming milk. The necessary testing facilities must be provided.

6.1.2 Control Tests for Incoming Milk

In addition to the minimum tests for acceptance of incoming milk elaborated in **5.3.4.4.2.2**; the following may verify the accepted milk:

i) The titratable acidity.
ii) The 10 minute resazurin test.
iii) The clot-on boiling test.
iv) The sediment tests.
v) Half-hour methylene blue reduction test.
vi) The determination of pH.
vii) Determination of preservatives and antibiotics.

6.2 Preservation Control Methods

6.2.1 Recommended Methods

Shall include fully developed, validated and approved methods in preservation of milk and milk products such as cheese manufacture, fermentation, water activity controls, etc

6.2.2 Unrecommended Methods

6.2.2.1 No chemical preservative shall be used in the preservation of milk.

6.3 Microbiological and Other Specifications

The milk and milk products shall comply with the microbiological quality of milk and milk products as prescribed in the relevant Kenya Standards.

6.3.1 Raw Milk

The raw milk for the manufacture of products covered by this code shall be evaluated based onsampling of milk from individual farms or milk collection centres, dairies or distribution points. This evaluation shall be made based on microbiological and other specifications as elaborated in KS EAS 67.

6.3.1.1 Samples representing individual producer cans should be collected from farm bulk milk tanks, collection centre tanks, cans or other acceptable containers.

6.3.1.2 Upon receipt, the milk shall be subjected to olfactory, lactometer, Resazurin visual and temperature checks with the aim of detecting serious problems with the raw milk. Raw milk suspected to be adulterated or contaminated shall not be accepted.

6.3.2 *End Product Specifications*

Processed milk products shall comply with quality and safety requirements elaborated by the relevant Kenya Standards.

6.3.3 Cross Contamination

6.3.3.1 Measures shall be put in place to ensure no cross contamination of raw milk and the processed milk products occurs

6.3.3.2 Operations involving packaging of heat treated milk and milk products in liquid form must be carried out in a manner to prevent contamination.

6.4 Reclaimed Water

6.4.1 Risk Considerations- Reclaimed water may be used in a manner that does not jeopardize the safety and quality of milk products, provided an adequate management plan is established.

6.4.2 The use of HACCP principles in the evaluation and control of potential hazards resulting from the use of reclaimed water is a recommended method to manage the use of this important resource.

6.4..3 The recovery process and the intended re-use of reclaimed water shall be subject to a hazard analysis and subsequent identification of appropriate critical control points identified in accordance with the Guidelines for the Application of HACCP Systems.

6.4.4 The recovered water shall be subject to frequent testing for appropriate parameters to ensure the efficacy of the HACCP system.

6.4.5 Recovery and re-use of reclaimed water within the establishment shall be treated so that its use does not contribute to health risks. The recovered and reclaimed water shall comply with the following general criteria:

(i) The reclaimed water used shall be microbiologically safe and shall at least meet the microbiological specification for potable water.

(ii) The reclaimed water shall be of a chemical and a physical suitability that does not adversely affect the safety of food and need not meet the physical and chemical specifications for potable water. The use of the reclaimed water will determine the suitability required.

(iii) The use of the reclaimed water will determine the organoleptic suitability required. Reclaimed water utilized in product, for washing product contact surfaces or where the potential exists for reclaimed water to come into contact with product will necessitate that its safety is at least equal to the requirements for potable water.

6.4.1.5 When complying to the above principles and criteria:

(i) Reclaimed water originating from product condensation or membrane filtration may be recovered and re-used for all potable water uses including the production of steam used in direct or indirect contact with the product.

(ii) Reclaimed water originating from the washing of curd during the manufacture of casein products, cheese and butter may be recovered and re-used for rinsing and cleaning of equipment surfaces directly or indirectly in contact with product surfaces (for instance, pre-rinsing of pipelines).

(iii) All reclaimed water may be used for general facility cleaning (floor, walls, and ceilings) and cleaning of the exterior of equipment provided there is no possibility of contaminating the product contact surfaces of processing equipment.

6.4.2 Distribution and Storage

i) Potable water and reclaimed plant water shall utilize separate distribution systems which are physically separated to prevent any possibility of cross-contamination.

ii) Reclaimed water distribution lines shall be easily identified. All distribution lines and hose stations shall be clearly identified.

iii) Reclaimed water lines shall not be permanently connected to product storage tanks or product processing equipment.

iv) Connections to product storage tanks shall be physically separated during product storage.

(v) Connections to product processing equipment shall be physically separated during processing.

v) Non-potable water which is not suitable for the purpose provided for above (for use in, for example, fire control, steam production, refrigeration and other similar purposes where it would contaminate the food) shall have a separate system, which is identifiable and not connected with, or allows reflux into, potable water systems.

vi) The water storage vessel shall be properly constructed of material(s) which will not contaminate water and allow for periodic cleaning.

6.5.3 Monitoring

Reclaimed water handling practices and guidelines and an appropriate monitoring programme shall clearly be described and displayed at appropriate locations within the processing plant. Reclaimed water shall be subject to frequent testing of samples taken at the point of use. When a problem exists at the point of use, the source shall be identified and proper action taken to ensure the integrity of the water system. Products produced during the time of the existing problems shall be evaluated to determine their acceptability and further, the requirements for corrective actions outlined in the HACCP Annex should be implemented.

7. ESTABLISHMENT: MAINTENANCE AND SANITATION

In addition to KS EAS 39; Code of practice for hygiene in the food and drink manufacturing industry , and the Codex General Principles of Food Hygiene-CAC/RCP 1-1 the following shall be considered:

7.1 Maintenance and Cleaning

Since wet environments encourage microbial growth, special efforts should be made to keep production areas as dry as possible. Wet cleaning shall not be used in areas where the product is exposed, and can be contaminated

by aerosols. Care shall be taken to adequately clean dead-spots, such as by-pass valves, sample cocks and overflow siphons in fillers. A routine program for verifying the adequacy of cleaning these spots should be in place.

7.2 Cleaning Programs

All equipment and utensils used in processing shall be cleaned and disinfected after each period of use and at least daily. After cleaning and disinfecting, equipment and utensils shall be rinsed with potable water unless it is shown that the disinfectants used in accordance with the manufacturer's instructions do not present a health risk to the consumer. Equipment and utensils shall then be drained and dried, where appropriate.

7.3 Clean-In-Place (CIP) Systems

7.3.1 CIP systems involve the following basic principles:

i) Detergent strength.
ii) Temperature of detergent measured on return
iii) Flow rate and pressure of detergent.
iv) Time of circulation.

7.3.2 Any deviation from the set levels shall initiate some form of alarm, which, in ideal circumstances, should shut the CIP system down until the correct levels have been obtained, whereupon the system ought to restart the cleaning from the beginning of the programme. A typical CIP programme would be:

(i) Pre-rinse;

(ii) Circulate with a suitable detergent or sanitizer;

(iii) Final rinse with cold, clean water;

Disinfect if necessary.

7.3.3 To achieve efficient CIP, regard must be given to plant design and construction. Any plant modifications or additions must be taken into account to ensure continuing efficiency of cleaning.

7.5 Waste Disposal

7.5.1 To dispose of liquid waste, the establishment shall:

i) Be equipped with an efficient centralized or individual liquid waste disposal system(s) approved by the relevant authorities and of suitable size and design to exceed the level of demand for liquid waste disposal at peak levels of activity by the establishment.
ii) Maintain the liquid waste disposal system in good working condition.

iii) Comply with any other relevant authority requirements related to liquid waste disposal.

7.5.2 To manage solid wastes; the establishments shall have an efficient management system complying with all requirements of the local authority; this include:

i) The allocation of an appropriate and separate place for solid waste storage, located at a convenient but suitably distant, from the milking area, production, handling and storage areas to prevent contamination.

ii) Sufficient number of suitably designed and constructed waterproof solid waste containers with tight fitting lids to adequately contain the volume of accumulated solid waste produced in the establishment in one day.

iii) Containers should be lined with suitable disposable liners or inner containers for securing waste and which are easy to handle at time of disposal preferably once a day.

iv) Approved, designed rubbish bins intended for the centralized collection of solid waste by garbage service agencies; or other disposal methods authorized and approved by the local authority.

v) Routine inspection of solid waste storage areas for the presence or harbourage of pests, taking any and all practical measures to eliminate and further prevent any infestation.

vi) Compliance with any other requirement of the relevant authority related to solid waste disposal.

8. ESTABLISHMENT: PERSONAL HYGIENE

8.1 Personal Hygiene

The establishment management shall ensure that every employee shall meet the following requirements:

8.2 Shall be examined and certified medically fit to work in a food industry as elaborated by the Public Health Act, Cap. 252 and food, drugs and chemical substances act, Cap 255 of the Laws of Kenya prior to employment and is examined thereafter every 6 months and a health record maintained.

8.3 Shall be educated on the benefits of personal hygiene practices and how behave in the establishment.

84 Shall be provided with appropriate and adequate facilities such as hand washing, changing rooms and adequate sanitary facilities and procedures to maintain high degree of personal cleanliness.

8.5 Shall be provided with protective clothing which is maintained in a clean condition.

8.6 Shall have procedures or maintain an atmosphere motivating employees to report any occurance of sicknesses or infectious diseases such as diarrhoea, vomiting, fever, jaundice, skin lessions, discharges, sore throat etc.

9. DISTRIBUTION OF MILK AND MILK PRODUCTS

9.1 Any person conveying, storing or displaying milk and milk products for sale and the premises shall therefore be registered and a certificate issued in accordance with the Public Health Act, Cap. 252 and the Dairy industry Act Cap 336 and food, drugs and chemical substances act, Cap 255 of the laws of Kenya.

9.2 Transport

9.2.1 The milk shall be transported in carriers complying with KS 37, Code of hygienic practice for milk carriers.

9.2.3 The vehicle shall be inscribed with the registered name, address and physical location of the distributor.

9.3 Cooling in Distribution

9.3.1 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.

9.3.2 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 IN, first OUT" (FIFO) shall apply in the entire value chain

9.3.3 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

9.4 Single Service Containers

9.4.1 Single service containers shall be discarded after one usage.

9.4.2 Precautions shall be taken to keep them clean prior to usage.

9.5 Bulk Dispensing of Milk Products

a) Bulk dispensing shall be authorised in accordance with the Public Health Act, Cap. 252 of the Laws of Kenya with respect to proper sanitary construction of dispensing container, equipment or vehicle and use.
b) Only processed milk and milk products shall be dispensed. All appropriate measures shall be taken to ensure that the product is not contaminated during transfer from point of processing to the bulk dispenser
c) A suitable cleaning and sanitization programme shall be in place and implemented

d) Bulk dispensers shall be regularly maintained as per the recommendations of the manufacturer or supplier

e) Labelling of the dispensed products shall be provided in accordance to the EAS 38

9.5.2 In bulk dispensing milk shall be maintained at temperatures of 5 - 7^{o}C.

9.5.3 In bulk dispensing milk shall be supervised by qualified personnel in hygienic practices of handling the devices.

9.6 Retailing of Milk

9.6.1 Shall be done in registered and licensed premises.

9.6.2 Milk for sale should be kept as cool as possible preferably under refrigeration and the proprietors shall keep the premises in sanitary conditions complying with the requirements of KS EAS 39 and rules and regulations for establishing retail centres exclusively for dairy products.

9.6.1 Direct Sales

9.6.1.1 Urban centres / cities

(i) Only pasteurised packaged milk shall be sold in its original packaging or through bulk dispensers

(ii) No direct sale of raw milk to consumers in municipalities shall be allowed and its enforcement shall be monitored by the Kenya Dairy Board and the local authority.

(iii) No milk shall be peddled within the municipalities

9.6.1.2 Rural and semi-rural areas

(i) Direct sale of milk by farmers or bulk distribution may only be allowed when restricted to a fixed time and distance as follows.

i) Within 5 hours of milking in the morning

ii) Within 2 hours of milking in the afternoon or boiled after 2 hours

iii) Within a distance of 5 Km from the point of production and distributed within 5 hours of milking in the morning hours and 2 hours in the afternoons.

iv) The farmer must be registered and licensed by the relevant authority

v) Adequate control by relevant authority shall be provided.

9.6.2 The retail centre shall comply with the control measures elaborated in 5 and 6 of this code.

9.6.3 The retail centre shall have an effective cleaning and sanitation programme.

9.6.5 The retail Centre shall register it's milk suppliers and keep records for each supplier with the following details:

9.6.5.1 Name of farmer, address and physical location.

9.6.5.2 Number of cows in milking.

9.6.5.3 Time of milking.

9.6.5.5 Frequency of visits or inspections by legal authorities or their agents to validate hygienic practices or educate the farmer.

9.7 The centre shall be so equipped as to carry out simple tests as specified in 5.3.5.2.

10. RECORDS

Records shall be kept and maintained on the following:

10.1 Milk Production — Milk production of registered farmers at dairies including collection and retail centres.

10.1.1 Certificate of registration or licence.

10.1.2 Lactation history of the cow.

10.1.3 Health records.

10.1.5 Output of milk per cow.

10.2 Collection Centres and Processing Plants

10.2.1 Registration book and cards for farmers.

10.2.2 Supplier records indicating quantity and quality.

10.2.3 Approval license from Kenya Dairy Board and inspection certificate by Public Health Department for handling of milk and its products.

10.2.5 Medical examination records of personnel.

10.2.5 Training and professional records for personnel.

10.2.6 Relevant equipment and calibration records.

10.2.7 Cleaning schedules.

10.3 Processing Plants Only — In addition to 10.2 the following shall be recorded:

10.3.1 Quality management documents.

10.3.3 Identification of manufactured goods.

10.3.5 Environmental management records.

11. PACKAGING

11.1 Packaging shall be done in appropriately sealed food grade packaging materials as recommended by the relevant Kenya standards.

11.2 The packaging materials shall prevent damage, contamination or adulteration of the milk or milk product and shall be made of food grade materials.

12. PRODUCT INFORMATION AND CONSUMER AWARENESS

Milk and Milk products shall be labelled in accordance with KS EAS 38*.

Transporters of milk and milk products shall conspicuously display the registered name and address of the proprietor/ Company.

13. TRAINING

* Labelling of prepackaged foods and the relevant product standards.

13.1 All milk collecting centres in conjunction with the Kenya Dairy Board shall organise milk hygiene awareness and quality seminars to all milk producers or farmers.

13.2 All personnel handling milk and milk products shall be trained in principles of food hygiene.

13.3 All personnel manning or in charge of milk collecting and distribution centres shall be qualified with at least a certificate in Dairy Technology or other relevant fields

13.5 All personnel in charge of production, quality control in industry shall be a qualified Dairy Technologist or Food Technologist or other relevant fields with a minimum qualification of a Diploma from a recognised institution.

13.5 Consumer awareness campaigns shall be carried out to educate consumers to boil all raw milk

13.6 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;
• Fodder preservation 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.

Good animal husbandry practices