

# MINISTRY OF AGRICULTURE, LIVESTOCK & FISHERIES



SMALLHOLDER DAIRY COMMERCIALIZATION PROGRAMME

## MODULE V



# QUALITY ASSURANCE GUIDE FOR MILK DISPENSERS



This guide is intended to assist milk dispenser operators to source, handle and retail quality and safe milk that comply with regulatory and market requirements through the application of Quality Assurance Systems in milk production.

Like any other business, a milk dispenser operator should aim at meeting or surpassing their customers' expectations by providing high quality and pasteurized milk.



# ACKNOWLEDGEMENTS

The development and production of this guideline was made possible by the Smallholder Dairy Development Programme (SDCP) which is a joint development project between the Government of Kenya (GOK) and the International Fund for Agricultural Development (IFAD). The emphasis of the programme is on commercialization of dairy and dairy products through the Market Oriented Dairy Enterprises (MODE) approach.

The programme covers nine counties namely Nakuru, Trans Nzoia, Uasin Gishu, Bomet, Nandi, Bungoma, Kakamega, Nyamira and Kisii. The goal of the programme is to increase the incomes of poor rural households that depend substantially on production and trade of dairy products for their livelihoods by

- Improving the financial returns of market oriented production and trade activities by small-scale operators, through improved information on market opportunities, increased productivity, cost reduction, value adding and more reliable trade relations
- Enabling more rural households to create employment through, and benefit from, expanded opportunities for market-oriented dairy activities, as a result of strengthened farmer organizations.

Through the facilitation of SDCP, Kenya Dairy Board (KDB), a statutory organization established by an Act of Parliament, the Dairy Industry Act Cap 336, and in partnership with the Kenya Industrial Research and Development Institute (KIRDI) and Dairy Training Institute (DTI) developed this guide to assist milk bulking and cooling centers to establish and benefit from a Quality Assurance System.

The following are acknowledged for their participation and contribution in the development of this guide:

**(1) Smallholder Dairy Commercialization Programme (SDCP)**

- Moses Kembe
- Michael Kibiego

**(2) Kenya Dairy Board (KDB):**

- Dr. Philip Cherono
- Evans Mwangi
- Paul Ndung'u
- Kituto Kitele
- Mildred Kosgey

**(3) Kenya Industrial Research and Development Institute (KIRDI)**

- George Wanjala

**(4) Dairy Training Institute, Naivasha**

- Samuel Kamau
- Catherine Wangila

# PREFACE

The dairy industry in Kenya is one of the largest in Africa. With an estimated 5.2 billion litres of milk produced annually, the dairy industry is an important player in the economic and nutritional aspects of the Kenyan population. According to a survey conducted by the Kenya Markets Trust in 2016, 71% of the produced milk is marketed with sales of 5% across the fence, 55% to the informal segment and 40% to the formal sector.

Milk dispensing business in Kenya has grown over the last few years mainly driven by the increasing demand for quality and safe milk. The Kenya Dairy Board has licensed over 500 dispensers across the country especially in the major urban and peri-urban centres. The technology allows consumers to buy variable volumes of milk at relatively competitive prices.

The success of the milk dispensing business depends on a reliable supply of good quality milk and an active sizable market. The dispensers are required to retail pasteurized milk which can be processed in-house or sourced from licensed milk processors. The milk dispensing machines come in various capacities such as 150, 200, 250, 300, 400 and 500 litres.

The success of the milk dispensers has attracted a large number of technology service providers. The technological standards of the dispensers, which affect the quality and safety of milk, are however variable from one service provider to another. As a result, KDB has drafted supportive regulations to ensure standardization in milk dispensing technology and operations in the interest of consumer protection.

Adoption of Good Manufacturing Practices (GMP) and Quality Assurance Systems (QAS) in milk dispensing is an important step in consistently delivering quality and safe milk to consumers. Building the capacities of the milk dispensing operators is therefore required to ensure that these businesses are conscious of and make deliberate efforts to comply with the regulatory and market demands.

The Government of Kenya has continued to support the development of the Kenyan dairy industry through policy and standards development and regulation among others

The goodwill and support from our development partners including IFAD has immensely contributed to make the Kenyan dairy industry a fast growing enterprise that supports and nourishes many Kenyans.

We hope that this guide will be of value to milk dispensing businesses and other stakeholders in adopting best practices and QAS that will lead to improvement in the quality and safety of milk and milk products.

**Moses Kembe,**  
**Programme Coordinator,**  
**SDCP**

**Margaret Kibogy,**  
**Managing Director,**  
**KDB**

# ABBREVIATIONS

<b>DTI</b>	Dairy Training Institute
<b>GDP</b>	Gross Domestic Product
<b>GOK</b>	Government of Kenya
<b>GMP</b>	Good Manufacturing Practices
<b>IFAD</b>	International Fund for Agricultural Development
<b>KDB</b>	Kenya Dairy Board
<b>KIRDI</b>	Kenya Industrial Research and Development Institute
<b>MODE</b>	Market Oriented Dairy Development
<b>QA</b>	Quality Assurance
<b>QAM</b>	Quality Assurance Manual
<b>QAS</b>	Quality Assurance System
<b>SDCP</b>	Smallholder Dairy Commercialization Programme
<b>SOP</b>	Standard Operating Procedures

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# CHAPTER 1: INTRODUCTION

## 1.1 Purpose

The purpose of this guide is to assist milk dispensing businesses to source and retail quality and safe pasteurized and homogenized milk that complies to regulatory and market requirements. These requirements include the physical, chemical and microbiological specifications as provided by the relevant Kenyan standard for pasteurized milk.

Milk dispensing is an innovative technology of retailing milk which has gained popularity with over 500 licensed outlets. Dispensed milk provides consumers with an alternative over the traditional sources of milk such as milk bars and milk processors. Milk dispensers are required to retail quality and safe pasteurized and homogenized milk sourced from licensed milk processors. Quality gaps in milk dispensing include sub-standard milk dispensers, poor location of the dispensers, dispensing of raw milk, breaking of the cold chain during delivery of the milk to the dispensing outlet, use of inappropriate retail containers, limited skills of the dispensing operators and poor cleaning and sanitization regimes.

The quality gaps are being addressed through a review of the regulatory framework, routine inspections and capacity building of the operators.

The guide will provide a framework for good milk handling practices including establishing preventive and control mechanisms and maintaining proper documentation in milk dispensing operations.

## 1.2 Objectives

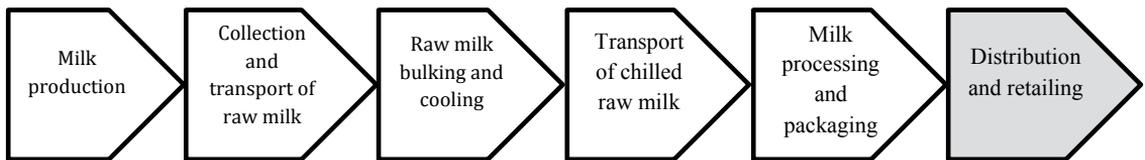
The guide will enable milk dispensing businesses to source, handle and retail quality and safe pasteurized milk through:

- (a) Identification of the requirements for milk dispensing
- (b) Identification of the causes of poor quality milk
- (c) Determination and implementation of preventive and corrective actions for quality management
- (d) Adoption of best practices in milk dispensing
- (e) Establishment and administration of quality assurance self-assessment tool
- (f) Undertaking proper documentation

## 1.3 Scope

This guide covers dispensing of pasteurized and homogenized milk, from sourcing, handling and retail. Aspects related to good milk handling practices, personnel, equipment, containers, vessels, vehicles and records requirements are addressed where relevant to the quality and safety of pasteurized milk.

**Figure 1: The Dairy value chain**



## 1.4 Structure

This guide is presented in four chapters covering the following in milk dispensing:

- (a) Introduction to Quality Assurance Systems
- (b) Quality and safety requirements in milk dispensing

- (c) Application of Quality Assurance in milk dispensing
- (d) Self-assessment guidelines to evaluate Quality Assurance practices in milk dispensing

# **CHAPTER TWO: INTRODUCTION TO QUALITY ASSURANCE SYSTEMS IN MILK DISPENSING**

## **2.1 What is quality?**

Quality is the totality of features and characteristics of a product or service to satisfy the stipulated needs and requirements of the users.

Milk dispensers are required by the Kenya Dairy Board to dispense quality and safe pasteurized and homogenized milk. The pasteurization process destroys pathogenic micro-organisms and reduces spoilage micro-organisms. This makes the milk safe for direct consumption. It also extends the shelf life of the product. Homogenization of milk breaks and uniformly distributes the fat globules thereby reducing the rate of fat separation and creaming. This is important in milk dispensing as un-homogenized milk has a higher tendency to clog the dispensing system which affects the dispensing and cleaning process. In addition, the product will not be homogenous.

## **2.2 What is Quality Assurance?**

Quality assurance (QA) is a management method that is defined as “all those planned and systematic actions needed to provide adequate confidence that a product, service or result will satisfy given requirements for quality and be fit for use” (ISO 1994).

In milk dispensing, QA entails identification, implementation and documentation of relevant activities that will lead to delivery of quality and safe pasteurized and homogenized milk to consumers.

## **2.3 What is Quality Assurance System?**

Quality Assurance System is a tool to help enterprises to operate more effectively and efficiently and comply with product or service specifications and requirements. They help to ensure that at every step of operation a minimum standard of defined quality is met for a product or service.

In milk dispensing such a system will help in establishing methods and practices essential for preventing, controlling and documenting the quality and safety of pasteurized milk during sourcing, handling and retailing.

In practice, there are several types of QAS that are applicable in milk dispensing such as:

- ISO 9001 Quality Management System
- ISO 22000 Food Safety Management System
- Hazard Analysis Critical Control Points (HACCP)
- Good Agricultural Practises (GAP)
- Total Quality Management (TQM)

These systems have basic principles of Quality Assurance which include:

- Design and scope of the system
- Management commitment and responsibility
- Systematic analysis and systematic action
- Process approach
- Customer focus
- Record keeping and documentation
- Continious improvement

This guide has adopted these principles to present a simple QAS that can be adopted and implemented in milk dispensing operations.

## **2.4 Components of a Quality Assurance System**

The components of a QA system in in milk dispensing can be grouped into three levels, namely;

- (a) The top level commitment by the owner of the milk dispenser to comply with product statutory and market requirements
- (b) The operational level which involves establishing, implementing and documenting methods and practices that will lead to sourcing, handling and dispensing of quality and safe pasteurized milk.
- (c) The assessment stage where the effectiveness of the QA system in meeting the desired goals is evaluated and remedial actions to improve the system instituted.

## **2.5 Steps in implementation of Quality Assurance Systems**

Generally, the implementation of a QA system in the food industry entail the following steps

- (a) Identification of the quality and safety goals of a product
- (b) Identification of the activities required to produce and meet the stated quality and safety goals of the product
- (c) Identification of the most likely problems that may occur and which may affect the quality and safety of the product
- (d) Establishment of preventive and control mechanisms to reduce the likelihood of the problem occurring
- (e) Identification and implementation of remedial actions to manage the problems if they occur
- (f) Establishment of documentation and records requirements
- (g) Identification and implementation of the assessment mechanism

## 2.6 Documentation requirements in a Quality Assurance System

Documentation is any written text document used to explain some attributes of an object, procedure or process. Documentation is an essential part of the QAS system. It provides the preventive and control measures that need to be implemented and also documents the various activities undertaken in the production of a good or service, their inter-relationship, characteristics and operating parameters.

The documents required in a QAS are summarized in figure 2 below

**Figure 2: Documents required in a QAS**



### (a) The Quality Assurance Manual (QAM):

Is the first level of documentation in a Quality Assurance System. The QAM clearly identifies the product being provided under the QAS and provides an understanding of the processes affecting quality and safety of the dispensed product.

The manual also describes:

- The business
- The scope of the QAS
- The quality policies which shows that the business is committed to providing quality and safe products
- The product and its specifications
- The processes involved in dispensing of the product

The QAM for a milk dispensing business will among other things provide:

- A brief profile of the business
- The commodity addressed (pasteurized milk)
- The product quality objectives (which is to source, handle and dispense quality and safe pasteurized milk that meets regulatory and market requirements)
- The processes involved in dispensing and handing of the product.

**(b) Quality Assurance Procedures:**

Quality Assurance Procedures (QAP) are vital in Quality Management System. They establish processes that identify the activities, establish what to look for in each activity based on a certain reference, acceptance criteria and the records to keep. They are simplified step-by-step sequence of activities or course of action that must be followed in the same order to correctly perform a task

In milk dispensing, Quality Assurance Procedures are required for the following activities among others;

- Sourcing of pasteurized milk
- Product storage
- Product dispensing
- Cleaning and sanitization programs
- Control of non-conforming products
- Control of records

**(c) Standard operating procedure (SOP):**

Are step-by-step instructions compiled to help workers carry out routine operations. SOPs aim to achieve efficiency, quality output and uniformity of performance. SOP's in milk dispensing ensure personnel follow the correct procedures in milk sourcing, handling and dispensing and would cover the following activities among others

- Cleaning of dispenser, cooling facilities and containers
- Operation of the milk dispenser

**(d) Quality Records:**

Are the documented evidences that processes are executed according to the QA plan and requirements. Such records in a milk dispenser include:

- Product delivery and analysis records
- Cleaning and sanitization records
- Equipment maintenance and calibration records
- Customer complaints
- Staff training records

**Figure 3: Benefits of record keeping in a milk dispensing business**



**Records in milk dispensing business are important for the following reasons**

- Accountability of operations
- Compliance with legislative requirements
- Quality improvement
- Management planning and decision making
- Communication to stakeholders

## **2.7 Importance of QA systems in milk dispensing**

A well designed and implemented QA system in milk dispensing will have the following benefits:

- (a) Increase confidence of customers on the quality and safety of the product
- (b) Protect consumers from possible health risks associated with poor quality and unsafe milk
- (c) Demonstrates the commitment of the business to market quality and safe pasteurized milk that meets market requirements
- (h) Establish traceability mechanism for the product
- (i) Overall contribute to increased operational efficiency and profitability of the enterprise

# **CHAPTER THREE: QUALITY AND SAFETY REQUIREMENTS IN MILK DISPENSING**

## **3.1 Quality and safety objectives in milk dispensing**

The objective of a milk dispenser is to source, handle and dispense quality and safe pasteurized and homogenized milk to consumers. The source of this milk should be licensed milk processors who have effective QAS in place.

Pasteurized milk should be delivered using appropriate means under recommended conditions. During delivery of the milk, quality records should be provided for verification and documentation.

Proper handling of the milk after delivery is important in maintaining the integrity of the product. This is based on two key principles:

- I. Avoiding or minimizing contamination of the milk
- II. Reducing the growth and activity of the micro-organisms in the milk

## **3.2 Regulatory requirements for milk dispensing**

The requirements for milk dispensing are stipulated in various Kenyan food legislations which include:

### **i. Laws and regulations**

- (a) Public Health Act Cap 242
- (b) Dairy industry Act Cap 336
- (c) Food, Drugs and Chemical Substances Act Cap 254
- (d) Standards Act Cap 496

## **ii. Standards and codes of practice**

Of relevance in milk dispensing are the following Kenyan standards and code:

- (a) Pasteurized milk specifications - KS EAS 69:2007
- (b) Standard specifications for drinking (potable water) - KS EAS 12
- (c) Code of hygienic practice for milk and milk products - KS 1552: 2015

In general, the above laws, regulations and standards require milk dispensing outlets to observe or comply with the following requirements:

### **(a) Hygienic milk sourcing, handling and dispensing**

Pasteurized milk should be sourced, handled and dispensed under conditions that minimize contamination from the environment, personnel, vehicle, equipment and containers among others.

### **(b) Certification of milk handlers**

Milk handling personnel should observe good personal hygiene that minimizes the likelihood of contaminating the milk. They should be free from communicable diseases and medically certified. The milk handlers should undergo basic training on hygienic milk handling and operation of the dispensing machine.

## Figure 4: Diseases that can be transmitted through milk



Milk can be contaminated with pathogenic micro-organisms from cattle and milk handlers which may lead to the following diseases in humans

- Typhoid fever
- Brucellosis
- Tuberculosis
- Diarrhea
- Infectious hepatitis

### (c) Compliance to product specifications

Milk dispensers mainly deal with pasteurized milk. Pasteurization is a heat treatment process applied to milk with the objective of eliminating possible health hazards arising from pathogenic micro-organisms which is consistent with minimal chemical, physical and organoleptic changes in the milk.

Pasteurized milk should comply with the following specifications among others (it should be noted that standards are dynamic and may change from time to time. Milk dealers are advised to keep abreast with revisions of the relevant standards).

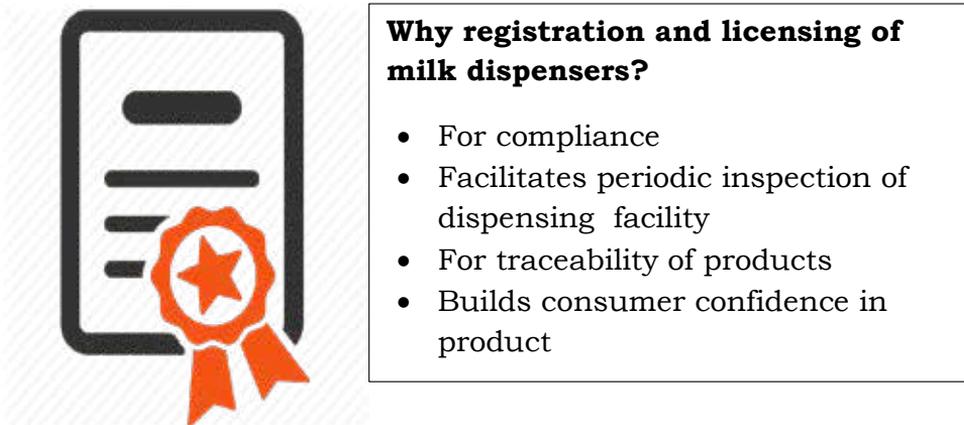
- Density at 20 °C shall be within the range of 1.028 g/ml – 1.036 g/ml
- Low bacterial counts not exceeding 30,000 CFU/ml
- Low coliform counts not exceeding 10 cfu/ml
- Be free from pesticides and veterinary drugs residues
- Be free from toxins e.g. aflatoxin M1
- Shall test negative for alkaline phosphatase enzyme

It is the responsibility of the milk dispenser operator to ensure that the supplier of the pasteurized conforms to the above requirement.

### **(d) Licensing of milk dispensers**

Milk dispensers are required to obtain licenses and permits from the relevant authorities before commencement of business. These include licenses issued by the Kenya Dairy Board and County Governments.

**Figure 5: Importance of licensing of milk dispensers**



# **CHAPTER FOUR: IMPLEMENTATION OF QUALITY ASSURANCE IN MILK DISPENSING**

## **4.1 Background**

The quality and safety of dispensed milk is influenced by many factors including the supplier, transportation, environment, personnel, dispensing equipment, containers, and cleaning and sanitization procedures among others.

The source of the dispensed milk is a major consideration in quality management and careful selection of prospective suppliers should be undertaken. Only those suppliers who have the capacity to process and deliver quality and safe milk that conforms to regulatory and market requirements should be considered. Contractual agreements that define the product specifications and delivery mode among others are recommended. Transportation process should protect the product from contamination such as dust, dirt, flies, rodents and adverse weather conditions. The transport vehicles or vessels should be clean and sanitary and constructed and equipped to maintain the product at appropriate low temperatures. The vehicle should be exclusively used to transport processed milk only. The bulk milk vessels should be kept sealed at all times.

Training of milk handlers is key in developing the necessary skills to support the implementation of a Quality Assurance System in milk dispensing.

Adoption of a robust Quality Assurance System will therefore focus on sourcing, handling and dispensing of pasteurized milk. This can be categorized into three broad stages:

- (a) Preparatory stage
- (b) Milk sourcing and storage
- (c) Milk dispensing

In each of the three areas, the following Quality Assurance Practices are recommended.

#### **4.2 Preparatory stage**

The operators should adequately prepare premise, dispensing machine, containers, personnel and records among others as a pre-requisite to sourcing, handling and dispensing of milk. The dispensing machine and other milk handling containers should be adequately cleaned and sanitized using appropriate cleaning agents and as recommended by the supplier of the machine. The storage tanks and cans should also be cleaned and sanitized after each emptying. Proper rinsing using potable water after cleaning and prior to operation should be exercised.

Servicing and maintenance of the dispensing machine should be undertaken as per the maintenance schedule and in accordance with the recommendation of the technology provider. Routine calibration of the measuring devices of the dispenser should be conducted and documented as per the statutory requirements.

**Figure 6: Requirements for milk dispensers**



A milk dispenser should comply with the following requirements

- In built refrigeration system
- Removable dispensing nozzle for ease of cleaning
- Should have temperature monitoring and displaying device
- Be equipped with sanitary and food grade piping and accessories
- Have automated cleaning system (CIP)
- Be operated using fully sealed milk tanks made of stainless steel

In addition, the milk dispensing operations should comply with the following;

- (a) The dispensed milk should be cooled and maintained at not more than 4 degrees centigrade
- (b) The product should be dispensed in original containers or from bulk containers into which such product was placed at the milk processing plant. Intermediate transfers of the product should be avoided.
- (c) All parts of a bulk milk vending machine which come into direct contact with the milk or milk product should effectively cleaned and sanitized at the milk plant
- (d) Each vending machine should be located in a well-lighted room, area, or space which can be maintained in a clean condition and which is protected from overhead leakage from drains and piping or other contamination.

- (e) Each vending machine should be located so that the space around and under the machine can be readily cleaned and does not harbor insects, rodent and other vermin.
- (f) The floor area upon which vending machines are located should be in good repair, reasonably smooth and of cleanable construction, and be capable of withstanding repeated washing and scrubbing. This space and the immediate surroundings of each vending machine should be maintained in a clean condition.
- (g) The exterior construction of the vending machine should allow for ease of cleaning and prevent the entrance of insects and rodents
- (h) All interior surface and component parts of the vending machine should be designed and constructed to permit easy cleaning and should be kept clean at all times.
- (i) All product contact surfaces of the machine should be of smooth, nontoxic, corrosion resistant, and nonabsorbent material and should withstand repeated cleaning and sanitizing treatment by normal procedures.
- (j) Water used in vending machines should be of a safe and sanitary quality.

**Table 1: Recommended QA practices in preparatory stage of milk dispensing**

Factors to consider	Risk element	Requirements	Monitoring mechanism	Remedial action if requirements are not met	Records
<b>1 Premise</b>	Contamination of milk	Premise should be located away from sources of contamination	Physical inspection of premises and surroundings	Manage the source of contamination if applicable  Relocation of the dispenser	
		The floors, walls and ceilings should be clean and sanitized	Physical inspection	Renovate as required	Cleaning records
		The premise should	Physical	Provide adequate	

<b>Factors to consider</b>	<b>Risk element</b>	<b>Requirements</b>	<b>Monitoring mechanism</b>	<b>Remedial action if requirements are not met</b>	<b>Records</b>
		have adequate and protected lighting and ventilation	inspection	lighting Renovate as appropriate	
		Premise should have adequate hand washing and sanitization facilities	Physical inspection	Installation of required amenities Provide consumables such as soap and sanitizers	Replenishment records
		Adequate and clean toilet and sanitary facilities should be provided	Physical inspection	Provide adequate facilities as required	Cleaning schedule
<b>2 Equipment and containers</b>	Contamination of the milk	Surfaces of milk equipment and containers should be easy to clean and disinfect, corrosion resistant and not transfer harmful substances to the milk	Physical inspection	Repair or replace affected containers and vessels	
		Equipment, containers and piping and accessories should be clean and disinfected immediately after use	Physical inspection Rinse and swab tests of equipments and accessories	Review the cleaning and disinfection schedule	Cleaning schedule and records Results of rinse and swab tests
		The layout of the equipment should allow for adequate cleaning and prevent cross contamination	Physical inspection	Re-design the layout	
<b>3 Cleaning and sanitization programs</b>	Contamination of the milk	The cleaning and disinfecting agents should be effective, safe and easily rinsed	Physical inspection Cleaning efficiency tests	Replace reagents Review cleaning and sanitization program	Cleaning schedule Cleaning efficiency test results

<b>Factors to consider</b>	<b>Risk element</b>	<b>Requirements</b>	<b>Monitoring mechanism</b>	<b>Remedial action if requirements are not met</b>	<b>Records</b>
<b>4 Personnel</b>	Contagious diseases	Milk handlers should be free of contagious or infectious diseases which may be transferred or affect the quality and safety of the milk	Physical examination of milk handlers  Medical examination of milk handlers	Relieve infected personnel from milk handling duties	Valid medical certificates
	Contamination of the milk	Dispenser operators should observe personal hygiene, wear suitable protective attire and avoid undesirable behavior during milk handling	Physical inspection of milk handlers	Develop and implement personal hygiene rules for dispenser operators  Relieve affected milk handlers from milk handling duties  Train and sensitize dispenser operators on hygiene  Provide adequate and appropriate attire and sanitary facilities	Personal hygiene rules for milk handlers  Training records for milk handlers
<b>5 Water</b>	Contamination of the milk	Adequate and clean potable water for cleaning should be provided	Physical inspection  Testing water quality	Procure water from certified sources Water treatment  Protect water sources from possible contamination	Water procurement records  Water treatment records  Water quality tests results
<b>6 Waste management</b>	Contamination of milk and milk products and spread of contagious and infectious diseases	Liquid and solid waste should be disposed as per relevant regulations	Physical inspection	Comply with the relevant regulations	
		Ensure solid and liquid waste does not harbor flies, insects and other rodents	Physical inspection	Dispose solid and liquid wastes as per regulations	

### 4.3 Sourcing and storage of milk

Careful selection of the source of milk for dispensing should be undertaken. Suppliers should be vetted to make sure they have the capacity to consistently process and deliver quality and safe milk that conforms to regulatory and market requirements.

The can or bulk tank should be filled at the milk plant and sealed in a manner to make it impossible to withdraw, adulterate or contaminate the milk without breaking the seal. Transportation process should protect the product from contamination such as dust, dirt, flies, rodents and adverse weather conditions. The transportation conditions should maintain the temperature of the product at or 4 degrees centigrade.

The product should be received and stored in original cans or bulk tanks without any form of transfer to another container. This minimizes chances of contamination. The product should be stored at 4 degrees centigrade in a cold room or any other suitable refrigeration facility if the product is not dispensed immediately.

**Table 2: Sourcing and storage of milk**

Factors to consider	Risk element	Requirements	Monitoring mechanism	Remedial action	Records
1 Sourcing of milk	Poor quality milk	Milk should be wholesome and should not contain added water, preservatives, or other added substances as provided by the relevant standards	Receive quality records for each incoming batch of milk  Rapid testing for efficiency of pasteurization	Rejection of poor quality milk  Follow-up with supplier of milk in case milk is of poor quality  Identify reliable suppliers	Delivery and quality analysis records   Milk rejection records
2 Storage	Contamination and spoilage of the milk	Milk should be stored under hygienic conditions at 7 degrees centigrade or below	Physical inspection  Monitor storage and temperature conditions	Dispose contaminated or spoilt milk	Milk storage and disposal records

Factors to consider	Risk element	Requirements	Monitoring mechanism	Remedial action	Records
				Practice First in First Out (FIFO) principle in dispensing of milk  Modify storage conditions as required  Calibrate temperature measuring devices	Calibration records

#### 4.4 Milk dispensing

Dispensing of milk to consumers is one of the most sensitive stages in the dispensing process. The process should protect the milk from possible contamination that can occur from the dispenser, consumer’s retail container and the dispenser operators as they transfer milk from storage to the dispensing unit. The integrity of the milk should be maintained by dispensing from the original container as received from the processor.

The dispenser and its accessories should meet the approved food grade standards and specifications. It should provide a clean and closed environment that minimizes contamination of the milk. The time taken to dispense the milk should also be monitored and should not exceed 24 hours after delivery.

Consumers have a responsibility to ensure that they either procure or provide clean food grade retail containers. They should also be advised on how to handle and store the product as pasteurized milk is highly perishable.

**Table 3: Dispensing of milk**

Factors to consider	Risk element	Requirements	Monitoring mechanism	Remedial action if requirements are not met	Records
<p><b>1. Transfer of milk to the dispenser</b></p>	<p>Contamination of the milk</p>	<p>The milk is transferred and fed to the dispenser in its original container as received from the processor</p>	<p>Physical inspection</p>	<p>Review transfer practice and adjust as required</p>	
		<p>The milk should be maintained at 4 degrees centigrade or below during dispensing</p>	<p>Monitoring of the product temperature</p>	<p>Adjust temperatures accordingly  Routine calibration of temperature measuring device</p>	<p>Calibration records</p>
<p><b>2. Dispensing of the milk to customers</b></p>	<p>Contamination the milk</p>	<p>The retail containers should be clean and sanitized</p>	<p>Physical inspection</p>	<p>Advise customers to clean and sanitize their containers  Provide clean and sanitized food grade containers</p>	
		<p>The dispensing nozzle and environment should be kept clean at all times</p>	<p>Physical inspection</p>	<p>Protect dispensing nozzle from sources of contamination  Keep the dispensing environment clean  Minimize spillage of product during dispensing</p>	

**Figure 7: Personal hygiene tips for milk handlers**



**Milk handling personnel should maintain high degree of personal hygiene and be equipped with appropriate work attire. They should:**

- Wear neat and clean protective attire
- Wear clean safety boots
- Avoid wearing wrist watches, rings, earring, necklace or chain
- Hair should be trimmed and tucked inside the cap
- Cover all open wounds

# CHAPTER FIVE: SELF-ASSESSMENT GUIDELINES FOR MILK DISPENSER OPERATORS

In order to evaluate whether the milk dispensing operations are in conformity with the QAS, it is critical to routinely conduct a self-assessment.

Self-assessment is a rapid tool for internal appraisal that can give reliable results on the level of achievement and performance of the Quality Assurance System in place. This evaluation will also provide a framework and input to regulatory surveillance and support. It also provides a mechanism for continuous improvement of the Quality Assurance System.

The tool promotes confidence build up for market access and elevates the profile of the milk dispenser as a reliable source of quality and safe milk. This will improve the operational efficiency and profitability of the enterprise.

This can be done using a simple checklist as recommended below.

**Table 4: Self-assessment guideline for milk dispensers**

Consideration	Requirements	Assessment criteria	Requirements met?	
			Yes	No
<b>1. Preparatory stage of milk dispensing</b>				
<b>Premise</b>	Premise is located away from sources of contamination	Physical inspection		
	The floors, walls and ceilings are clean and sanitized	Physical inspection		
	The premise has adequate and protected lighting and ventilation	Physical inspection		
	Premise has adequate hand washing and sanitization facilities	Physical inspection		

Consideration	Requirements	Assessment criteria	Requirements met?	
			Yes	No
	Adequate and clean toilet and sanitary facilities are provided	Physical inspection		
<b>Equipment and containers</b>	Surfaces of milk equipment and containers are easy to clean and disinfect, corrosion resistant and do not transfer harmful substances to the milk	Physical inspection		
	Equipment, containers and piping and accessories are cleaned and disinfected immediately after use	Physical inspection		
		Rinse and swab tests		
	The layout of the equipment allows for adequate cleaning and prevents cross contamination	Physical inspection		
<b>Cleaning and sanitation programs</b>	The cleaning and disinfecting agents are effective, safe and easily rinsed	Physical inspection		
		Cleaning efficiency tests		
<b>Personnel</b>	Dispenser operators are free of contagious or infectious diseases which may be transferred or affect the quality and safety of the milk	Physical inspection		
		Medical examination		
	Dispenser operators observe personal hygiene, wear suitable protective attire and avoid undesirable behavior while handling milk	Physical inspection		
<b>Water</b>	Adequate and clean potable water for cleaning is provided	Physical inspection		
		Testing water for quality routinely conducted		
<b>Waste management</b>	Liquid and solid waste are disposed as per relevant regulations	Physical inspection		
	Solid and liquid waste does not harbor flies, insects and other rodents	Physical inspection		
<b>2. Sourcing and storage of milk</b>				
<b>Sourcing</b>	Sourced milk is wholesome and does not contain added water, preservatives, or other	Verification of the delivery and		

Consideration	Requirements	Assessment criteria	Requirements met?	
			Yes	No
	added substances as provided by the relevant standards	quality analysis records		
		Rapid testing for efficiency of pasteurization		
<b>Storage</b>	Milk is stored under hygienic conditions at 4 degrees centigrade	Physical inspection		
		Monitoring of temperature and storage conditions		
<b>3. Milk dispensing</b>				
<b>Transfer of the milk to the dispenser</b>	The milk is transferred and fed to the dispenser in its original container as received from the processor	Physical inspection		
	The milk is maintained at 4 degrees centigrade during dispensing	Monitoring of the product temperature		
<b>Dispensing milk to consumers</b>	The retail containers are clean and sanitized	Physical inspection		
	The dispensing nozzle and environment are kept clean at all times	Physical inspection		
<b>4. Customer feedback</b>				
<b>Handling of customer feedback and complaints</b>	There is a mechanism to receive and respond to customer complaints or feedback	Physical verification		
	Customer complaints are addressed on time	Physical verification		

# SAMPLE RECORDS

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## Equipment maintenance schedule

<b>Name of the farm</b>							
Date: _____							
Prepared by: _____							
Submitted by: _____							
Approved by: _____							
Equipment No.	Task description	Task duration	Due date	Target date	Resource name	Person responsible	Predecessor

## Cleaning schedule

Section	Frequency	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Responsible	Remarks

## **REFERENCES**

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- i) Public Health Act Cap 242, laws of Kenya
- ii) Food, Drugs and Chemical Substances Act Cap 254, laws of Kenya
- iii) Dairy Industry Act Cap 336, laws of Kenya
- iv) Draft Dairy Regulations 2017
- v) Standards Act Cap 496, laws of Kenya
- vi) Kenyan Specifications for raw cow milk, KS EAS 67:2007
- vii) Code of hygienic practice for milk and milk products
- viii) FAO and IDF, 2011. Guide to good dairy farming practice
- ix) Ministry of Livestock Development, 2012. Dairy Farmers Training Manual
- x) FAO. Milk processing Guide Series, Volume 2
- xi) Tetra Pak, 1995: Dairy Processing Handbook

Smallholder Dairy Commercialization Programme (SDCP)  
Programme Coordination Unit, P.O.Box 12261-20100 Nakuru, Kenya.  
Tel: +254-51-2210851, E-mail: [pcu.sdcp@gmail.com](mailto:pcu.sdcp@gmail.com), [pcu@sdcp.or.ke](mailto:pcu@sdcp.or.ke)  
Website: [www.sdcp.or.ke](http://www.sdcp.or.ke)

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Ministry of Agriculture  
Livestock and Fisheries



Investing in rural people



Smallholder Dairy Commercialization Programme (SDCP) is a jointly funded programme by the Government of the Republic of Kenya (GOK) and the International Fund for Agricultural Development (IFAD) and beneficiary communities.

The Overall goal of the programme is to increase the income of poor rural households that depend substantially on production and trade of dairy products for their livelihood.