



**MINISTRY OF  
FOREIGN AFFAIRS  
OF DENMARK**  
*Danida*

# Dairy Value Chain Trainers' Guide



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## **Disclaimer**

This training guide is for advisory use only. Users of this training guide should work closely livestock extension officers. It is also advised that this training guide should be used in conjunction with the respective value chain manual and other relevant resource materials.

## **Compilers**

Benedict Khanyifu, Eric Agesa, Teresiah Ndungu and Paul Busienei

## **Editors**

Mwalimu Menza

## **Design and Layout: Odipo Stephen**

## **Published by**

Micro-Enterprises Support Programme Trust

MESPT Plaza, 01 Tausi Rd

Westlands, between Westlands Rd &Muthithi Rd.

P.O Box 187-00606 Sarit Centre.

Email: [info@mespt.org](mailto:info@mespt.org)

Tel: 0722 207 905 | 0735 333 154



## FOREWORD

The Micro Enterprises Support Programme Trust (MESPT) is a local development organization founded in 2002 through a partnership between the Government of Kenya (GoK), the European Union (EU), and later, the Royal Danish Government. MESPT's main goal is to eradicate poverty by supporting the growth of micro-enterprises, including agricultural production, agribusiness, and afro-processing. This support aims to foster social, economic, and environmentally sustainable growth by increasing access to financial and business development services, creating jobs, and promoting sustainable micro-enterprises. Our vision is to build a more prosperous society, and our mission is to provide sustainable business development and financial services to smallholder farmers and agri-MSMEs in Kenya.

For over two decades, our team of professionals has been at the forefront of developing cost-effective and scalable solutions that promote financial inclusion and support the growth of sustainable agribusinesses. We accomplish this by providing tailored financial solutions that meet the specific needs of various agricultural value chains, delivered through a wholesale lending model to financial service providers such as SACCOs, MFIs, and Farmer Cooperatives. These providers, in turn, extend loans to smallholder farmers and micro agricultural enterprises.

Our approach emphasizes delivering integrated financial and business development services to smallholder farmers and MSMEs in Kenya, helping them access finance, boost agricultural productivity, improve afro-processing and connect to markets. Over the years, we have worked closely with county governments, development agencies, donors, and investors to strengthen business development capacities in the agricultural sector, using a unique tripartite model that connects farmers, SMEs, and financial institutions.

Dairy is among key value chains that have been supported by MESPT over the years through various interventions in order to enhance commercialization. MESPT appreciates the importance of documenting best practices for the value chain in facilitating effective delivery of training for farmers and Agripreneurs. Therefore, MESPT has facilitated the development of this manual alongside the value chain trainers' guide and other resource materials through Green Employment in Agriculture Programme (GEAP) with support from DANIDA.

This guide is expected to enhance effectiveness in delivery of trainings on Good Agricultural Practices and commercialization of the value chain. I am optimistic that this manual will be helpful to partners in the value chain including county governments. I am grateful to DANIDA for the continued support to MESPT programmes. I am also thankful to the value chain experts who spearheaded compilation of this guide.

**Rebecca Amukhoye,**

**Chief Executive Officer, Micro-Enterprises Support Programme Trust**

# PREFACE

The Green Employment in Agriculture Programme is a 5 years' programme (2021 to 2025) funded by DANIDA and implemented by Micro-Enterprises Support Programme Trust (MESPT). GEAP seeks to contribute directly to Kenya's vision 2030 and to one of Denmark-Kenya Strategic Framework on accelerated decent employment creation in MSMEs and improved competitiveness of targeted value chains in agriculture which will contribute to transforming the economy towards a greener and more inclusive growth.

GEAP programme targets 40,000 smallholder farmers and will be implemented in 12 counties namely, Kilifi, Kwale, Nakuru, Nyandarua, Siaya, Kisii, Kakamega, Bungoma, Trans Nzoia, Uasin Gishu, Makueni and Machakos. The programme facilitates increased commercialization, decent employment, and green transformation through targeted interventions in seven selected agriculture value chains that include, Dairy, Export Vegetables, Mango, Avocado, Indigenous Poultry, Coconut, and Aquaculture.

MEST through GEAP tasked multidisciplinary teams to develop resource materials tailored for extension service providers and farmers. A dairy training guide is one of the series of the materials that were developed. MESPT further tasked dairy value chain experts to develop a Training manual for the dairy value chain. The manual is to be used as an instructional manual for training on implementation of good agricultural practices, value addition and marketing for the dairy value chain. Relevance of the content is based on needs identified among value chain players, actors and aligned to GEAP project objectives. The training content is drawn from relevant dairy resource materials.

This Training manual consists of two sections. Section I comprises information about the dairy value chain, guidelines and notes for facilitators while section II comprises of the training modules. The modules have a uniform outline that ensures every aspect of the handbook is fully covered using approaches that the trainees can easily understand. The modules are progressively arranged to achieve a logical flow of the sessions. Recommended training durations are also provided.

A variety of delivery methods are outlined and where possible, demonstrations and practical work is incorporated. To maintain quality of training across various groups and settings, trainers' guidelines, program, training methods and training evaluation have been provided in the manual. It is advised that the training manual should be used in conjunction with the respective value chain handbook and other relevant reference materials. It is also recommended that participant hand outs and facts sheets are provided to trainers.

MESPT is grateful to the value chain experts who spearheaded the development and production of this training manual. It is my hope that counties and other users will adopt and optimally use this resource for the dairy value chain development so as to increase productivity and profitability while ensuring a greener and more inclusive growth.

**Doreen Kinoti**

**Programme Manager, Green Employment in Agriculture Programme**

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The Green Employment in Agriculture Programme (GEAP) participating counties (Kilifi, Kwale, Nakuru, Nyandarua, Siaya, Kisii, Kakamega, Bungoma, Trans Nzoia, Uasin Gishu, Makueni and Machakos) are acknowledged for providing resource persons in compilation of the document. The technical support and expertise provided by Kenya Agricultural and Livestock Research Organisation in development of the document is appreciated. Thanks to the Royal Danish Government's Danish International Development Agency (DANIDA) for facilitating the development of this re-source material. Micro Enterprises Support Programme Trust (MESPT) is appreciated for co-ordinating the process of development and production of this document.

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# LIST OF ABBREVIATIONS

<b>DANIDA</b>	Danish International Development Agency
<b>EU</b>	European Union
<b>GAP</b>	Good Agricultural Practices
<b>GEAP</b>	Green Employment in Agriculture Programme
<b>GOK</b>	Government of Kenya
<b>HACCP</b>	Hazard Analysis Critical Control Point
<b>KEBS</b>	Kenya Bureau of Standards
<b>MESPT</b>	Micro Enterprises Support Programme Trust
<b>MSME</b>	Micro, Small and Medium Enterprises
<b>PMR</b>	Partly mixed rations
<b>Q&amp;A</b>	Questions and Answer
<b>TMR</b>	Total Mixed Ration

# **Dairy Value Chain Trainers' Guide**

# SECTION I

This section consists of sub-sections, which include an overview of the dairy Value chain in Kenya, Green growth opportunities in the dairy sub-sector, the Objectives of the training, the Content of the Training, and Facilitator Guidelines.

## 1.0 Overview OfThe Dairy Value Chain In Kenya

The dairy sub-sector in Kenya contributes 4.5% of the Gross Domestic Product (GDP), approximately 14% and 44% of the Agricultural and Livestock GDP respectively (KNBS, 2022). The sub-sector is currently valued at KES 237 billion (SDL, 2022).

The dairy value chain is ranked highly under the Bottom-up Economic Transformation Agenda (BETA) Government model as one with the highest potential impact in addressing high cost of living, generating revenue, increasing foreign exchange earnings, creating jobs and with inclusive growth. The BETA is aligned with Vision 2030, Medium Term Plan (MTP) IV and Agriculture Sector Transformation and Growth Strategy (ASTGS) that focuses in transforming the livestock sub-sector (including dairy) to a modern commercially oriented sector through increased productivity and value addition.

The sub-sector supports 1.8 million dairy farmers, of which 80% are smallholder farmers, and over 750,000 actors along the value chain (Dairy Masterplan, 2022). The cattle, camels, goats and sheep population has been estimated at 21,200,347, 4,427,881, 33,681,560 and 24,801,605, respectively (SDL, 2021). The total annual milk production from the four species of livestock is estimated to be 5.02 billion litres of which 3.715 billion litres (74%) is attributed to cattle, 1.054 billion litres (21%) to camels, 0.201 billion litres (4%) to goats and 0.05% to sheep (FAOSTAT, 2022).

## 1.1 Green Growth Opportunities In The Dairy Value Chain

Green growth opportunities in the dairy value chain involve adopting sustainable practices, technologies, and innovations that reduce environmental impact, enhance resource efficiency, and create economic value. These opportunities focus on balancing economic growth with environmental stewardship, particularly relevant in regions like Kenya, where agriculture and dairy farming are central to livelihoods but also contribute to greenhouse gas emissions and environmental degradation. The key green growth opportunities in the dairy value chain include Sustainable Feed Production, Manure Management and Waste Valorization, Efficient Dairy Farming Practices, Water Resource Management, Renewable Energy Integration, Low-Carbon Milk Processing, Waste Reduction and Resource Optimization, Carbon Sequestration, Consumer Awareness and Green Marketing, Green Financing and Policy Support.

Green growth in the dairy value chain not only supports sustainable development but also ensures the long-term viability of the sector while addressing critical environmental challenges. These opportunities align with Kenya's broader goals under its Climate Change Action Plan and Green Economy Strategy and Implementation Plan (GESIP).

## 1.2 Overall Objectives OfThe Training

The objective of this training is to equip trainees with the knowledge and skills necessary to increase productivity through the adoption of Good dairy Practices (GAP) and principles. Specifically, the objectives of this training are to:

1. Provide farmer trainers with relevant attitudes, knowledge, and skills in dairy farming as a business and market assessment techniques for market-led production.
2. Enhance farmer trainers' knowledge and skills in dairy GAP, including on-farm dairy species selection, establishment, and field management.
3. Equip farmers trainers with knowledge and skills in post-harvest and value addition in dairy.

### 1.3 Organization OfThe Training Content

The training content is organized into ten modules, which are targeted and orientated to ensure the adoption and upscaling of best practices in dairy, good dairy Practices for improved productivity and competitiveness in a market-driven production system. The purpose of these modules is to enhance the knowledge and capacities of trainers in understanding and disseminating best practices in dairy—good dairy Practices to the intended beneficiaries, who are primarily farmers.

A summary of the modules is presented in **Table 1**.

**Table 1: Summary of the 11 training modules**

No.	Module Name	Areas addressed	Expected Training Outcomes	*Duration
1	Introduction to the Kenyan dairy industry	<ul style="list-style-type: none"> <li>Dairy industry in Kenya</li> <li>The importance of dairy farming in Kenya</li> <li>National Milk Production Trends</li> </ul>	<ul style="list-style-type: none"> <li>Introduction to dairy industry</li> <li>Knowledge of dairy farming production</li> <li>Better understanding of the dairy value chain.</li> <li>Better understanding of the milk production trends in Kenya</li> </ul>	4hrs
2	Dairy production systems	<ul style="list-style-type: none"> <li>Introduction to the dairy production systems.</li> <li>Dairy Cattle Breeds</li> <li>Advantages and challenges of each of the dairy production systems</li> </ul>	<ul style="list-style-type: none"> <li>Awareness of the dairy production systems</li> <li>Knowledge of improved dairy management practices enhanced</li> <li>Better understanding of the advantages and challenges of dairy production systems</li> </ul>	6hrs



No.	Module Name	Areas addressed	Expected Training Outcomes	*Duration
3	Calf rearing	<ul style="list-style-type: none"> <li>• Overview of key aspects in rearing dairy calves</li> <li>• Calf feeding</li> <li>• General Management practices</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge in calf rearing</li> <li>• Better understanding of the general calf management practices</li> </ul>	3hrs
4	Heifer rearing	<ul style="list-style-type: none"> <li>• Outline of best practices for heifer rearing</li> <li>• Breeding Management</li> </ul>	<ul style="list-style-type: none"> <li>• Improved skills in the heifer rearing.</li> <li>• Knowledge in breeding management.</li> </ul>	2hrs
5	Feeding and management of dairy cows	<ul style="list-style-type: none"> <li>• Qualities of a good dairy cow</li> <li>• Feeding</li> <li>• Nutrient requirements of a dairy cow</li> <li>• Feed conservation</li> <li>• Breeding methods</li> </ul>	<ul style="list-style-type: none"> <li>• Improved understanding and adoption of best practices in dairy nutrition and feed formulation</li> <li>• Better understanding of a dairy nutrient requirements and feed conservation</li> <li>• Awareness and knowledge in the dairy breeding methods</li> </ul>	4hrs

No.	Module Name	Areas addressed	Expected Training Outcomes	*Duration
6	Clean milk production	<ul style="list-style-type: none"> <li>• Composition of Milk</li> <li>• Nutritional Value</li> <li>• Physical Characteristics</li> <li>• Types of Milk (Processing and Fat Content)</li> <li>• Health Benefits of Milk</li> <li>• Milking Methods</li> <li>• Basic milk quality tests</li> </ul>	<ul style="list-style-type: none"> <li>• Understand milk composition, nutritional value and physical characteristics.</li> <li>• Better understanding and knowledge in health benefits of milk, milking methods and basic milk quality tests.</li> <li>• Milk contaminants and their sources</li> </ul>	5 hrs
7	Dairy cattle housing	<ul style="list-style-type: none"> <li>• Siting of the dairy Unit</li> <li>• Zero grazing plan</li> </ul>	<ul style="list-style-type: none"> <li>• Better understanding of site selection of the zero grazing unit and its specification</li> </ul>	1 hr
8	Common diseases	<ul style="list-style-type: none"> <li>• Causes of common dairy diseases</li> <li>• Identification of disease symptoms</li> <li>• Preventive measures</li> </ul>	<ul style="list-style-type: none"> <li>• Understand disease causes symptoms and there preventive measures.</li> <li>• Distinguish between metabolic, tickborne, viral and bacterial diseases</li> </ul>	2 hrs

No.	Module Name	Areas addressed	Expected Training Outcomes	*Duration
9	Agribusiness and marketing	<ul style="list-style-type: none"> <li>• Production plan (business plans)</li> <li>• Gross margins and breakeven point</li> <li>• Record keeping</li> <li>• Marketing and market access</li> <li>• Value addition</li> <li>• Financial literacy</li> <li>• Business opportunities in dairy</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze and understand market trends, profitability</li> <li>• Develop mitigation strategies</li> <li>• Make informed decisions to optimize production</li> </ul>	2 hrs
10	Dairy farm records	Management records Financial records	Better understanding of dairy farm management and financial record	1 hrs
TOTAL				30 Hours

\*Training duration is inclusive of relevant practical and demonstration sessions. This training duration does not include break hours of mid-morning, lunch and afternoon breaks.

#### 1.4 Partners and their Roles

The partners envisioned in this training include:

- a) **Trainers** - The trainees drawn from KALRO, Service providers (SPs), lead farmers and other experts who will further cascade the training to farmer groups and other value chain players.
- b) **County Government**—The county Government will provide a team as ToTs.
- c) **Lead Farmers** – These are early adopters or role models at the community level. They are supposed to allow their farms to be used as learning sites.

## 1.5 Facilitators Guidelines

### 1.5.1 Preparation of Training Materials

- The facilitators should familiarize themselves and internalize the guidelines provided in this manual prior to the training.
- The training materials should be available before the actual training dates.
- The stationery required should be available within the training venue before the training. These include name tags and writing materials
- Visual aids like field equipment and tools should also be arranged in time before the sessions start.
- Flip charts and good quality felt pens could be used interchangeably with projections.
- There should be adequate copies of participants' handouts (one per participant) to be distributed at the end of each session or as may be suitable.
- Copies of the modules can be distributed at the end of each module.

### 1.5.2 Preparation of Training Venue and Sites

The training venue will include the training room, field demonstration sites and market areas.

- a) Training Room** – Should have adequate space for participants seated in an arrangement that ensures unobstructed view of the front. A group of 20 to 30 participants is ideal. There should also be adequate desks and space for the trainers, their training materials and projector, flip charts holders.
- b) Demonstration Site** – Preferably should be within a walking distance for the trainee.
- c) Market Sites** – these include retail outlets (kiosks, stalls, shops and supermarkets), whole sale and aggregation points and processing sites if any. The operators should be informed in advance about the visits. These should not be very far away, preferably less than 20 minutes' drive.

### 1.5.3 The Trainees

The trainees will be drawn from public and private sector based on their roles in the value chain. The trainer should act more of a facilitator than a lecturer.

### 1.5.4 Training Program

The training program proposed consists of the actual training modules and the corresponding days and time allocation (**Annex I**).



### 1.5.5 Training Methods

The training methods proposed for each session are suitable for adult learners and appropriate for addressing knowledge, skills and attitudes of the participants. The choice of the methods has been informed by the competency issues being addressed, time available and experiences of the author of this manual. Depending on time available, the facilitator can modify these training methods but as a golden rule no presentation by the facilitator should take more than 30 minutes continuously; but should be separated by the other participatory training methods. Table 2 presents a list of available training methods.

**Table 2: Description of Training methods**

Training Method	Description of Method
Plenary presentations	Use of PowerPoint or flip charts and plenary discussions in situations where knowledge and opinion or consensus is required
Group exercises, buzz groups, visits and brainstorming sessions	To be considered where skills are an issue requiring sharing and trying
Role plays and problem-solving exercises	Plenary discussions have been considered as training methods where attitude is an issue
On-farm practical demonstration and exchange visits	To be considered where hands-on practical skills are acquired through practical and demonstrations

### 1.5.6 Managing the Training Sessions

The logic of design and flow of each module is that the facilitator, paying attention to the proposed methods and session guidelines shall: (i) Introduce the module; (ii) Draw out the participant's expectations; (iii) Relate participants' expectations with module objectives or learning outcomes; (iv) Explore the concept and content, switching to different methods of delivery of the content (group exercise, brainstorming, excursions, plenary discussions) (v) Review the module at the end using participatory approaches like one participant reads one summary message and its application; and, (vi) Distribute the participants' handouts.

### 1.5.7 Evaluation of the Training

Half an hour has been allocated for planning for way forward and evaluation of the training on the last day of training. The individual trainees individually fill valuation forms. The evaluation forms are then collected and analyzed by the core facilitators.

**Table 3: Sample Evaluation Form**

1. Gender of respondent (Please tick): Male [ ] Female [ ]

2. Please provide feedback on the topics by filling the table below

Aspect / Module	Rating (Tick only one per topic)		
	Very Useful (3 marks)	Useful (2 marks)	Of Limited Use (1 marks)
1) Introduction to the Kenyan dairy industry			
2) Dairy production systems			
3) Calf rearing			
4) Heifer rearing			
5) Feeding and management of dairy cows			
6) Clean milk production			
7) Dairy cattle housing			
8) Common diseases			
9) Agribusiness and marketing			
10) Dairy farm records			

3. Were the training materials (Power Point , handouts) adequate? (Please tick) Yes [ ]  
No [ ]

Give reasons: .....

2. How are you intending to apply what you have learnt from this training?.....

4. Please suggest areas of improvement

.....

## SECTION II: TRAINING MODULES

This part presents the content of 10 training modules

### 1.0 Outline Of The Modules

Each of the modules consisting of 4 parts. These parts are:

- i) Content– Context and background to training needs, knowledge and skills GAP being addressed; sequence of sessions, training methods, materials.
- ii) The module duration indicated is an estimation of the recommended minimum length of time the trainee is exposed to the training content
- iii) Module learning outcomes – What trainees are expected to learn
- iv) Facilitators guideline –detailed sessions, training methods, materials and session guides.

## MODULE 1: INTRODUCTION TO THE KENYAN DAIRY INDUSTRY

### 1.0 Overview

This module introduces the trainee to an overview of dairy farming in Kenya, the existing production systems and the common dairy breeds. The trainee should be able to understand the production system they are operating on, the breed types and their characteristics and therefore be able to choose a good dairy cow with the desired quality attributes

### 1.1 Module learning outcomes

By the end of the module, the following outcomes should be achieved:

1. Introduction to dairy industry in Kenya
2. Knowledge of dairy farming production systems
3. Understanding the dairy breed and their characteristics
4. Understanding the qualities of a good dairy cow

## I.2 Module Summary

Module I: Introduction			
Sessions	Training methods	Training materials	Time
<ul style="list-style-type: none"><li>• Introduction to dairy industry in Kenya’s</li><li>• Actors in the dairy value chain</li></ul>	<ul style="list-style-type: none"><li>• Discussions</li><li>• Interactive discussions,</li><li>• Demos,</li><li>• PowerPoint presentation and handouts,</li><li>• Field excursions,</li><li>• Pictorials,</li><li>• Group work,</li><li>• Q&amp;A,</li><li>• Projects and assignments</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens.</li><li>• Laptop</li><li>• Projector</li><li>• Participants’ handouts</li></ul>	1 hour
<ul style="list-style-type: none"><li>• Discuss the various production systems in use: Extensive, semi-intensive, Intensive</li><li>• Characteristics of the production systems</li></ul>			30 hour
1. Merits and demerits of each system			1 hr
<ul style="list-style-type: none"><li>• Types of dairy breed in Kenya (exotic and indigenous)</li></ul> <p>The characteristics of every breed</p>			30 mins
Discuss the desired qualities in a good dairy cow			1hr
<ul style="list-style-type: none"><li>• Highlight the various reasons that will inform the choice of a production system</li><li>• Identify the key strengths and weaknesses of different breeds</li></ul> <p>Match breeds to the various production systems based on their key strengths and characteristics</p>			
Total duration			4 hours



### I.3 Facilitator Guideline

I.4.1 Introductions and Climate Setting	Session guide
<p><i>(The facilitator welcomes trainees to the module and, after that, invites them to introduce themselves and state their expectations)</i></p> <p><b>Levelling of expectations</b></p> <p>The trainees form groups (e.g., sub-county-based) and list their expectations, norms, and rules.</p> <p><i>The facilitator presents module objectives.</i></p> <p><b>Objectives</b></p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• To define the importance of dairy in Kenya's economy.</li> <li>• Describe requirements for dairy production.</li> <li>• Understand and be able to apply innovative dairy production and management technologies in the target counties.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize the facilitator/trainee's involvement in the dairy Value chain.</li> <li>• PowerPoint presentation</li> </ul>
I.4.2 Importance of Dairy in Kenya's economy	
<p><b>Plenary Presentation</b></p> <ul style="list-style-type: none"> <li>• Dairy overview</li> <li>• Dairy in Kenyan households</li> <li>• General Dairy production trends in Kenya</li> </ul> <p><b>Guided discussions by the Facilitator</b></p> <p>Questions/answers/comments</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>
I.4.3 Dairy Production Requirements	Session guide
<p><b>Plenary Presentation</b></p> <ul style="list-style-type: none"> <li>• Sites for dairy production</li> <li>• Requirements for dairy production</li> </ul> <p><b>Facilitator's guided discussion</b></p> <p>Questions/answers/comments</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>

1.4.4 Dairy production and constraints in the target areas	Session guide
<p><b>Plenary Presentation</b></p> <p>Facilitator guide in reviewing and discussing suitability map (County by County)</p> <p><b>Group exercise.</b></p> <p>Trainees to bring out specific county or sub-county Dairy yields and constraints to Dairy production and present in the plenary:</p> <ul style="list-style-type: none"> <li>• Sites suitable for Dairy</li> <li>• Average yield of dairy per breed</li> <li>• Constraints to dairy production</li> <li>• Opportunities to address the constraints.</li> </ul> <p><b>Discussions/presentations from the groups</b></p> <p>Let the trainees/groups share the group exercise outcomes</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work.</li> <li>• Open discussions with the guidance of the facilitator</li> <li>• Plenary discussion</li> </ul>
1.4.5 Module review	Session guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summary of the main points from the training</p> <ul style="list-style-type: none"> <li>• Objectives and expectations (review done on the basis of the expectations listed earlier)</li> <li>• Trainees to recall the dairy production requirements, dairy production average productivity by breed, and constraints in the target Counties.</li> <li>• Trainees will indicate new sets of skills and knowledge acquired from the module. The results are recorded per county presented.</li> <li>• Trainees will randomly identify the issues for the way forward.</li> </ul> <p><b>Facilitator's guided discussion</b></p>	<ul style="list-style-type: none"> <li>• The last participants' handouts/training materials</li> <li>• Summarize the main points of the module on a flip chart and display.</li> <li>• Plenary discussion</li> </ul>

# MODULE 2. DAIRY PRODUCTION SYSTEMS

## 2.0 Introduction

This module is designed for training and exposing trainees to understand what dairy production systems is all about and their importance in dairy farming. The dairy animals are mainly raised under three main production systems, which include intensive, semi-intensive and extensive systems. The smallholder/ pastoral systems own 80% of the dairy animals and produce 70% of the milk. The smallholder systems are operated under subsistence units with herd size of 3-5 cows of exotic and their crosses, kept under either intensive, semi-intensive or extensive systems. In Kenya, dairy production is an important part of the Livestock sector, and it generally operates within three main production systems, Intensive or Zero-Grazing System, Semi-Intensive System and Extensive or Free-Grazing System respectively.

The module also exposes the trainees to advantages and challenges of each of the dairy production systems and how of the dairy cattle breeds.

## 2.1 Learning outcomes

The participants will be expected to understand key components in the following areas:

1. Awareness of the dairy production systems
2. Knowledge of improved dairy management practices enhanced
3. Better understanding of the advantages and challenges of dairy production systems

## 2.2 Module Summary

Module 2. Dairy Production Systems			
Sessions	Training Methods	Training Materials	Time
2.0 Introduction to the dairy production systems.  2.1.1 Intensive or Zero-Grazing System 2.1.2 Semi-Intensive System  2.1.3 Extensive or Free-Grazing System	<ul style="list-style-type: none"> <li>Groups to bring out expectations.</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Module objectives</li> <li>Marker pens</li> <li>Flip charts</li> <li>Projector</li> <li>Laptop</li> </ul>	3 hours
2.2 Advantages and challenges of each of the dairy production systems	<ul style="list-style-type: none"> <li>PowerPoint</li> <li>Presentation</li> <li>Group discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flips charts</li> <li>Felt pens.</li> <li>Laptop</li> <li>Projector</li> <li>Manila paper</li> </ul>	1 hour
2.3 Dairy Cattle Breeds understood and appreciated	<ul style="list-style-type: none"> <li>Group Exercises to identify Cattle breeds.</li> <li>Plenary Presentations</li> <li>Plenary discussion</li> <li>Field demonstration</li> </ul>	<ul style="list-style-type: none"> <li>Flips charts</li> <li>Felt pens.</li> <li>Laptop</li> <li>Projector</li> <li>Manila papers</li> </ul>	2 hour
<b>TOTAL</b>			<b>6 hours</b>

## 2.3 Facilitator's Guidelines



2.4.1 Introduction and Levelling Expectations	Session guide
<p><i>The facilitator welcomes trainees to the module and introduces themselves, stating their profile and experience of working with farmers.</i></p> <p><b>Trainees' introductions and expectations</b></p> <p>The facilitator invites the trainees to state their expectations after brainstorming in their respective county groups.</p> <p><b>Module Objectives</b></p> <p><i>The facilitator presents the module's objectives.</i></p> <p>By the end of the module, the trainee should be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the dairy production systems</li> </ol>	<ul style="list-style-type: none"> <li>• Summarize trainees' Expectations on a flipchart.</li> <li>• PowerPoint presentation</li> </ul>
2.4.2 Understanding advantages and challenges of each of the dairy production systems	Session guide
<p><i>(The facilitator describes the dairy systems and guides the trainees in identifying and differentiating the various dairy breeds).</i></p> <p><b>Group exercise and discussion.</b></p> <p>Ask trainees to highlight and describe some of the Dairy cattle breeds they know.</p> <p><b>Plenary Presentation</b></p> <ul style="list-style-type: none"> <li>• Dairy cattle breeds.</li> <li>• Dairy production systems</li> </ul> <p><i>Show trainees the photographs of each breed with their full descriptions.</i></p>	<ul style="list-style-type: none"> <li>• Distribute participants' handouts.</li> <li>• Group exercise.</li> <li>• Plenary discussion</li> </ul>
2.4.3 Module Review	Session guide

<p><i>The trainer should lead the trainees in reviewing the module.</i></p> <ul style="list-style-type: none"> <li>• Summarize and review with the trainees the main points of the training on dairy production systems and best management practices.</li> </ul>	<p>Recap of the key take-home points using any of the following participatory methods:</p> <ul style="list-style-type: none"> <li>• Q &amp; A session</li> <li>• Discussions</li> <li>• Questionnaires</li> </ul>
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## MODULE 3. CALF REARING

### 3.0 Introduction

This module is designed for training and exposing trainees to Calf rearing, overview of key aspects in rearing dairy calves, Calf feeding and general calf management Practices. The calf is the foundation of the future dairy herd which signifies the importance of proper calf rearing. Selection of replacements for culled cows can only be effective if good replacement heifers are available and, in enough numbers, to allow for a more rigid selection. A good feeding and management programme will result in lower death rate (mortality), replacement heifers that start production early and fast growth resulting in rapid genetic improvement. Proper calf rearing practices ensure the calves grow into productive dairy cows.

### 3.1 Learning Outcomes

At the end of the module, the participants are expected to understand:

- a. Better knowledge in calf rearing
- b. Better understanding of the general calf management practices

### 3.2 Module Summary

Module 3: Calf rearing			
Sessions	Training methods	Training materials	Time
3.0 Introductions and climate setting, objectives, and expectations	<ul style="list-style-type: none"><li>• Self-introduction</li><li>• Setting Norms &amp; rules</li><li>• Plenary Presentation</li><li>• Plenary discussion</li><li>• Group exercise</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens.</li><li>• Laptop</li><li>• Projector</li></ul>	30 minutes

3.1 Overview of key aspects in rearing dairy calves	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Group exercise.</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens.</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	1 hour
3.2 Calf feeding	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Group exercise.</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens.</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	1 hour
3.3 General management Practices	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Group exercise.</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens.</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	30 minutes
<b>Total</b>			<b>3 hours</b>

### 3.4 Guidelines for Facilitators

<b>Module 3: Calf Rearing</b>		
<b>3.0. Introductions, climate setting</b>	<b>Session guide</b>	



<p><b>Preliminaries</b></p> <p><i>The facilitator welcomes trainees to the module and then invites them to introduce themselves and state their expectations.</i></p> <p><b>Expectations</b></p> <p>The trainees from groups (e.g., county-based) and list expectations from the module.</p> <p><i>The facilitator presents the module objectives.</i></p> <p><b>Objectives</b></p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate acquisition of skills and knowledge of Calf rearing.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize the trainees' expectations.</li> <li>• PowerPoint presentations</li> <li>• Group exercise (listing and presenting expectations).</li> <li>• Expectations lists are kept for later review of compliance.</li> </ul>	
<p><b>3.1. Outline of best practices for heifer rearing</b></p>	<p><b>Session guide</b></p>	
<p><b>Plenary presentation</b></p> <ol style="list-style-type: none"> <li>1.Nutrition and Feeding.</li> <li>2. Housing and Environment.</li> <li>3.Health Management.</li> <li>4.Breeding Management.</li> <li>5.Record Keeping.</li> <li>6.Transition to Milking Herd</li> <li>4.Growth Monitoring</li> </ol> <p><b>Plenary discussion</b></p> <p>Questions/answers and comments</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Distribute participants' handouts.</li> <li>• Groups exercise</li> <li>• Plenary discussion</li> </ul>	

## MODULE 4. HEIFER REARING

### 4.0 Introduction

This unit will take the trainees through Heifer rearing that is a process of managing young female calves until they reach maturity and are ready for breeding. Proper heifer rearing is essential for dairy farming, as it directly impacts milk production, reproduction, and the overall profitability of the herd. Heifers represent the future of the herd. At the same time, they are non-productive animals incurring expenditure in terms of feed, labour and veterinary services without immediate returns. Raising heifers is a financial investment that begins to bring dividends after the first calving; therefore, the goal should be to make ensure proper growth rate at minimum costs to be inseminated on time in order to realize full lactation potential later in life

### 4.1 Learning outcome

At the end of the module, the participants are expected to understand:

1. Improved skills in the heifer rearing.
2. Knowledge in breeding management.
3. Outline of best practices for heifer rearing

### 4.2 Module Summary

Module 4: Heifer Rearing			
Sessions	Training methods	Training materials	Duration
4.0 Introduction, objectives, and expectations	<ul style="list-style-type: none"> <li>• Self-introduction</li> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Projector for PowerPoint presentation</li> <li>• Laptop</li> </ul>	30 minutes
4.1 Outline of best practices for heifer rearing	<ul style="list-style-type: none"> <li>• Plenary Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Projector for PowerPoint presentation</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	1 hour
4.2 Module review and discussion	<ul style="list-style-type: none"> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> </ul>	30 minutes
<b>Total</b>			<b>2 hours</b>

### 4.3 Facilitator's Guidelines

Heifer Rearing	
4.4.1. Introduction, Objectives and Expectations	Session guide
<p><i>(The facilitator welcomes trainees to the module. The trainees are then invited to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge and skills in Heifer rearing</li> <li>• Apply best management practices in dairy production.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees' "Expectations" and display.</li> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts on Module.</li> <li>• Objectives and Training Program</li> </ul> <p>Distribution of handouts to trainees</p>
4.4.9. Module review	Session guide
<p><i>The facilitator leads the trainees in reviewing the module)</i></p> <ul style="list-style-type: none"> <li>• Summarize the main points of the training and review the main points together with the trainees.</li> <li>• Discuss new things learned from this module with trainees.</li> <li>• Let them identify some of the problems and any other issues arising from the module.</li> </ul>	<p>Recap of the key take-home points using any of the following participatory methods:</p> <ul style="list-style-type: none"> <li>• Q &amp; A session</li> <li>• Discussions</li> <li>• Questionnaires</li> <li>• Any other method</li> </ul>

# MODULE 5. FEEDING AND MANAGEMENT OF DAIRY COWS

## 5.0 Introduction

Proper feeding and management of dairy cows is essential to ensure high milk production, optimal health, and overall farm profitability. The dairy cow is like a machine that converts raw materials (feed and water) into milk. The raw materials are mainly plant materials which are not edible by humans but the cow is able to convert into high quality human food.

## 5.1 Learning outcome

At the end of the module, the participants are expected to understand: Management and feeding of the dairy cow.

1. Improved understanding and adoption of best practices in dairy nutrition and feed formulation
2. Better understanding of a dairy nutrient requirements and feed conservation ration in dairy production
3. Awareness and knowledge in the dairy breeding methods

## 5.2 Module Summary

Module 5: Feeding and management of dairy cows			
Sessions	Training methods	Training materials	Time
5.0 Introduction, objectives, and expectations	<ul style="list-style-type: none"><li>• Self-introductions</li><li>• Group exercise.</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Marker pens</li><li>• Laptop</li><li>• Projector</li></ul>	30 minutes
5.1 Qualities of a good dairy cow	<ul style="list-style-type: none"><li>• Group work.</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Practical exercise</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Marker pens</li><li>• Projector</li><li>• Laptop</li><li>• Participants' handouts</li></ul>	1 hour



5.2 Feeding a dairy cow	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> <li>• Field observations</li> <li>• Group work</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens.</li> <li>• Handouts</li> <li>• LCD Projector</li> <li>• Lab apparatus (Microscopes, Dissecting kit, trays, slides, and coverslips)</li> <li>• Fish specimens</li> </ul>	1 hour 30 minutes
5.3 General management of dairy cows	<ul style="list-style-type: none"> <li>• Group work.</li> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> <li>• Practical session</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	1 hour
<b>Total</b>			<b>4 hours</b>

### 5.3 Facilitator's Guidelines

Module 5: Feeding and management of dairy cows	
5.0 Introduction and levelling of expectations and objectives	Session guide
<p><b>Introduction</b></p> <p><i>(The facilitator welcomes trainees to the module and, after that, invites them to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of the training module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Understand feeding and management of a dairy cow <ul style="list-style-type: none"> <li>• Learn and understand Factors affecting rate of conception</li> </ul> </li> <li>• Understand Factors affecting milk production</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees' "Expectations."</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>
5.1 Module review	Session guide

*(The facilitator leads the trainees in reviewing the module)*

Summarize the main points of the training on feeding and management of dairy cows.

- The last participants' handouts
- Summarize the main points from the module on a flip chart and display.

# MODULE 6. CLEAN MILK PRODUCTION

## 6.0 Introduction

This unit will take the trainees through clean milk production. Milk is a nutrient-rich liquid produced by mammals, primarily to nourish their young. In dairy farming, milk is harvested from cows and other animals for human consumption.

## 6.1 Learning Outcomes

At the end of the module, the participants are expected to:

1. Understand milk composition, nutritional value and physical characteristics.
2. Better understanding and knowledge in health benefits of milk, milking methods and basic milk quality tests.
3. Understand Milk contaminants and their sources

## 6.2 Module Summary

Module 6. Clean milk production			
Sessions	Training Methods	Training Materials	Time
6.0 Introduction, Objectives Expectations	<ul style="list-style-type: none"> <li>• Personal introduction</li> <li>• Group work.</li> <li>• Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Projector</li> <li>• Laptop</li> </ul>	30 minutes
6.1 Composition of Milk and Health Benefits of Milk	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Group exercise.</li> <li>• Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens.</li> <li>• Projector</li> <li>• laptop</li> <li>• Participants' handouts</li> </ul>	2 hour
6.2. Nutritional Value and basic milk quality tests	<ul style="list-style-type: none"> <li>• PowerPoint</li> <li>• Plenary presentation</li> <li>• Group exercise.</li> <li>• Demonstrations/Practical's</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens.</li> <li>• Participant handouts</li> </ul>	1 hour



6.3. Physical Characteristics of milk	<ul style="list-style-type: none"> <li>• Group exercise.</li> <li>• Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Checklist for prioritisation</li> <li>• Pair-wise ranking tool.</li> <li>• Flip charts</li> <li>• Felt pens.</li> <li>• Participants' handouts</li> <li>• Projector</li> <li>• Laptop</li> </ul>	30 minutes
6.4. Module review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• PowerPoint presentations</li> <li>• Module evaluation forms</li> </ul>	1 hour
<b>TOTAL</b>			<b>5 hours</b>

## 6.4 Facilitator's Guidelines

<b>Module 6. Clean milk production</b>	
<b>6.0 Introduction, expectations, and objectives</b>	<b>Session guide</b>
<p><b>Introduction and expectations</b></p> <p><i>(The facilitator welcomes trainees to the module. They are then invited to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives.)</i></p> <p>By the end of the module, the trainee should be able to</p> <ul style="list-style-type: none"> <li>• Understand and share skills in clean milk production</li> <li>• Enhance knowledge and skills in personal hygiene and milk handling</li> <li>• Explain skills for best management practices in milk preservation and value addition.</li> <li>• Enhance knowledge and practical skills in milk value addition.</li> <li>• To monitor the quality and safety of milk value-added products.</li> <li>• Appreciate the practical skills in milk packaging and branding.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• PowerPoint Presentation</li> <li>• Summarize trainees' expectations and display them on a flip chart/board.</li> </ul>
<b>6.1 Composition of Milk and Health Benefits of Milk</b>	<b>Session guide</b>
<p><i>The trainer explains the composition and health benefits of milk, milk safety and guides trainees in discussing and playing video clips on hygiene requirements for milk handlers.</i></p> <ul style="list-style-type: none"> <li>• Importance of Good milk Handling Practices,</li> <li>• Hygiene requirements for milk handlers</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Play video on milk hygiene requirements</li> <li>• Q&amp;A sessions</li> <li>• Group exercise</li> </ul>
<b>6.2 Nutritional Value and basic milk quality tests</b>	<b>Session guide</b>

<p><b>Plenary presentation</b></p> <p><i>Present the following on PowerPoint and flip charts.</i></p> <ul style="list-style-type: none"> <li>• Basic milk quality tests.</li> <li>• Apply good product handling practices in their farms to reduce milk contamination.</li> <li>• How to prevent milk Contamination</li> <li>• Temperature control</li> <li>• Display units.</li> </ul> <p>Sources of milk borne diseases</p> <ul style="list-style-type: none"> <li>• Humans</li> <li>• Food/Product</li> <li>• Sanitization and Equipment Maintenance.</li> <li>• Plenary discussions</li> <li>• Group work and audiovisuals</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participant handouts</li> <li>• Brochures, leaflets, manuals, factsheets, posters</li> <li>• PowerPoint presentation</li> <li>• Demonstration/ Practical</li> <li>• Videos</li> </ul>
<p><b>6.3 Physical Characteristics and types of milk (Processing and Fat Content)</b></p>	<p><b>Session guide</b></p>
<p><i>(The trainer guides trainees on physical characteristics and types of milk make a Power Point presentation on the listed aspect)</i></p> <p>Milk processing</p> <p><b>Plenary discussions</b></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group Exercise</li> <li>• Distribute trainees.</li> <li>• handouts</li> <li>• Information Sheet</li> <li>• Q&amp;A session</li> </ul>
<p><b>6.7 Module review</b></p>	<p><b>Session guide</b></p>

<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Review the main points about clean milk production together with the trainees.</p> <ul style="list-style-type: none"> <li>· What new things did you learn from this Module?</li> <li>· What are some of the problems and issues that you have become more aware of in milk value addition?</li> <li>· What questions do you still have about milk value addition?</li> </ul>	<p>Summary of the main points from the Module.</p>
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# MODULE 7. DAIRY CATTLE HOUSING

## 7.0 Introduction

The housing requirements of dairy cows are essential for their health, productivity, and overall welfare. Good housing provides shelter, comfort, and ease of movement and includes design features that allow effective waste management, ventilation, feeding, and milking.

## 7.1 Learning Outcome

At the end of the module, the participants are expected to:

1. Better understanding of the zero grazing unit and its specification.
2. Site selection of the zero-grazing unit

## 7.2 Module Summary

Module 7. Dairy Cattle Housing			
Sessions	Training Methods	Training Materials	Time
7.0. Introduction, learning outcomes and expectations (Levelling of participants' expectations about the module and objectives)	<ul style="list-style-type: none"><li>• Introduction</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• Marker pens</li></ul> Masking tapes/ flip chart holders	10 minutes



Module 7. Dairy Cattle Housing			
Sessions	Training Methods	Training Materials	Time
<p>7.1 Trainer presents the following on the Dairy cattle housing;</p> <ul style="list-style-type: none"> <li>i. Dairy cattle housing</li> <li>ii. Space Requirements</li> <li>iii. Ventilation and Air Quality.</li> <li>iv. Bedding and Comfort.</li> <li>v. Feeding and Water Access.</li> <li>vi. Waste Management.</li> <li>vii. Lighting.</li> <li>viii. Flooring.</li> <li>ix. Milking Area Requirements.</li> <li>x. Calving Pens.</li> <li>xi. Exercise and Outdoor Access.</li> <li>xii. Biosecurity and Pest Control.</li> <li>xiii. Zero Grazing Layout</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Group exercise.</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Masking tapes/ flip chart holders</li> </ul>	40 minutes
7.2. Module review	<ul style="list-style-type: none"> <li>• Facilitator's summary</li> <li>• Plenary presentation</li> <li>• Plenary Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Module review</li> <li>• Participants handouts</li> </ul>	10 minutes
<b>TOTAL</b>			<b>1 hour</b>

### 7.3 Facilitators Guidelines

Module 7. Dairy Cattle Housing	
7.0. Introduction, expectations, and objectives	Session guide
<p><b>Introduction and expectations</b></p> <p><i>(The facilitator welcomes trainees to the module. They are then invited to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives.)</i></p> <p>By the end of the module, the trainee should be able to</p> <ul style="list-style-type: none"> <li>• Better understanding of the zero grazing unit and its specification.</li> <li>• Site selection of the zero-grazing unit</li> <li>• Appreciate the practical skills in zero grazing layout.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• PowerPoint Presentation</li> <li>• Summarize trainees' expectations and display them on a flip chart/board.</li> </ul>
7.1 Module review	Session guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Review the main points about dairy cattle housing together with the trainees.</p> <ul style="list-style-type: none"> <li>• What new things did you learn from this Module?</li> <li>• What are some of the problems and issues that you have become more aware of in dairy cattle housing?</li> <li>• What questions do you still have about dairy cattle housing?</li> </ul>	<p>Summary of the main points from the Module.</p>

## MODULE 8. COMMON DISEASES

### 8.0 Introduction

This module guide the trainees through common dairy disease. Dairy cows are susceptible to several diseases that can impact their health, milk production, and overall welfare. Common diseases in dairy cows include metabolic, infectious, and reproductive disorders. The module will guide trainers on some of the most prevalent diseases in dairy cows, along with their symptoms, causes, and prevention methods.

### 8.1 Learning Outcomes

The participants will be expected to understand key components in the following areas:

1. Understand common dairy diseases along with their symptoms, causes, and

prevention methods.

2. Distinguish between metabolic, tickborne, viral and bacterial diseases

## 8.2 Module Summary

<b>Module 8: Common diseases</b>			
<b>Sessions</b>	<b>Training methods</b>	<b>Training materials</b>	<b>Time</b>
8.0. Introduction, objectives, and expectations	<ul style="list-style-type: none"> <li>• Self-introductions</li> <li>• Group exercise.</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Marker pens</li> <li>• Laptop</li> <li>• Projector</li> </ul>	20 minutes
8.1. Common dairy diseases and their causes.  <ul style="list-style-type: none"> <li>• Identification of disease symptoms</li> </ul> Preventive measures	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Marker pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	1 hour 20 minutes
8.2. Module Review	<ul style="list-style-type: none"> <li>• Discussion/ Recap of the module</li> <li>• Take away messages</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Participants' handouts</li> </ul>	20 minutes
<b>Total</b>			<b>2 hours</b>



### 8.3 Facilitator's Guidelines

Module 8: Common diseases	
8.0. Introduction and levelling of expectations and objectives	Session guide
<p><b>Introduction</b></p> <p><i>(The facilitator welcomes trainees to the module and, after that, invites them to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of the training module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Identify common dairy cattle diseases, implement control measures for Dairy cattle diseases, parasites and pest control and Distinguish between metabolic, tickborne, viral and bacterial diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees' "Expectations."</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>
8.1. Common dairy cattle diseases, control measures for Dairy cattle diseases, parasites and pest control and Metabolic, tickborne, viral and bacterial diseases	Session guide
<p><i>The facilitator makes presentations on:</i></p> <ol style="list-style-type: none"> <li>Common dairy cattle disease.</li> <li>Symptoms</li> <li>Control measures</li> </ol> <p><b>Plenary discussion</b></p> <p>Question and answer session, comments</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
8.1 Module review	Session guide

<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training on Common dairy cattle diseases.</p>	<ul style="list-style-type: none"> <li>• The last participants' handouts</li> <li>• Summarize the main points from the module on a flip chart and display.</li> </ul>
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## CHAPTER 9. AGRIBUSINESS AND MARKETING

### 9.0 Introduction

Agribusiness and marketing are crucial elements in dairy production, helping farmers and producers optimize profitability, reach consumers, and manage a sustainable dairy enterprise. Successful agribusiness practices and effective marketing strategies ensure efficient production, distribution, and sale of dairy products.

### 9.1 Learning Outcomes

At the end of the module, the participants are expected to:

1. Analyze and understand market trends, profitability
2. Develop mitigation strategies
3. Make informed decisions to optimize production

### 9.2 Module Summary

Module 9: Agribusiness and marketing			
Sessions	Training methods	Training materials	Time
9.0. Introduction, objectives, and expectations	<ul style="list-style-type: none"> <li>• Self-introductions</li> <li>• Group exercise.</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Marker pens</li> <li>• Laptop</li> <li>• Projector</li> </ul>	20 minutes

9.1. Production plan (business plans), Gross margins and breakeven in dairy production.	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Marker pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	40 minutes
9.2. Marketing and market access, Value addition, Financial literacy and Business opportunities in dairy sector.	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Marker pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	40 minutes
9.3. Module Review	<ul style="list-style-type: none"> <li>• Discussion/Recap of the module</li> <li>• Take away messages</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Marker pens</li> <li>• Participants' handouts</li> </ul>	20 minutes
<b>Total</b>			<b>2 hours</b>

### 9.3 Facilitator's Guidelines

<b>Module 9: Agribusiness and marketing</b>	
<b>9.0. Introduction and levelling of expectations and objectives</b>	<b>Session guide</b>

<p><b>9.1 Introduction</b></p> <p><i>(The facilitator welcomes trainees to the module and, after that, invites them to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of the training module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>Analyze and understand market trends, profitability, Production plan (business plans), Gross margins and breakeven point in dairy production.</li> <li>Develop mitigation strategies, Knowledge and understanding Marketing and market access, Value addition, Financial literacy and Business opportunities in dairy sector.</li> <li>Make informed decisions to optimize production</li> </ul>	<ul style="list-style-type: none"> <li>Summarize trainees' "Expectations."</li> <li>PowerPoint presentation</li> <li>Participants' handouts</li> </ul>
<p><b>9.2 • Business opportunities in dairy cow production</b></p>	<p><b>Session guide</b></p>
<p><i>The facilitator makes presentations on:</i></p> <p>Market trends, profitability, Production plan (business plans), Gross margins and breakeven point in dairy production</p> <p><b>Plenary discussion</b></p> <p>Question and answer session, comments</p>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>
<p>Mitigation strategies, Marketing and market access, Value addition, Financial literacy and Business opportunities in dairy sector.</p>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> </ul> <p>Plenary discussion</p>
<p><b>9.3 Module review</b></p>	<p><b>Session guide</b></p>
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training on Agribusiness and marketing</p>	<ul style="list-style-type: none"> <li>The last participants' handouts</li> <li>Summarize the main points from the module on a flip chart and display.</li> </ul>





# MODULE 10. DAIRY FARM RECORDS

## 10.0 Introduction

This module will analyze farm records in dairy production, keeping accurate and organized records is essential for managing the herd, monitoring productivity, ensuring animal health, and maintaining profitability. Good records allow dairy farmers to make data-driven decisions that can improve farm efficiency and compliance with industry standards.

## 10.1 Learning Outcomes

The expected learning outcomes are as follows:

1. Make informed decisions and better understanding of dairy farm management and financial record

## 10.2 Module Summary

Module 10: Dairy Farm Records			
Sessions	Training methods	Training materials	Time
10.0. Introduction, objectives, and expectations	<ul style="list-style-type: none"><li>• Self-introductions</li><li>• Group exercise.</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Marker pens</li><li>• Laptop</li><li>• Projector</li></ul>	10 minutes
10.1. General Management Farm Records in dairy production.	<ul style="list-style-type: none"><li>• PowerPoint presentation</li><li>• Group work</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Marker pens</li><li>• Projector</li><li>• Laptop</li><li>• Participants' handouts</li></ul>	30 minutes
10.2. Module Review	<ul style="list-style-type: none"><li>• Discussion/Recap of the module</li><li>• Take away messages</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Marker pens</li><li>• Participants' handouts</li></ul>	20 minutes
<b>Total</b>			<b>1 hours</b>

### 10.3 Facilitator's Guidelines

<b>Module 10: Dairy Farm Records</b>	
<b>I. Introduction and levelling of expectations and objectives</b>	<b>Session guide</b>
<p><b>10.0 Introduction</b></p> <p><i>(The facilitator welcomes trainees to the module and, after that, invites them to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of the training module the trainee should be able to have a:</p> <ul style="list-style-type: none"> <li>• Better understanding of the Dairy Farm Records and make informed decisions to optimize production.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees' "Expectations."</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>
<b>10.1 Module review</b>	<b>Session guide</b>
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training on Dairy Farm Records.</p>	<ul style="list-style-type: none"> <li>• The last participants' handouts</li> <li>• Summarize the main points from the module on a flip chart and display.</li> </ul>

# MODULE 11. GENDER EQUALITY, HUMAN RIGHTS AND SOCIAL INCLUSION

## 11.0 Introduction

Gender equality, human rights, and social inclusion are essential for achieving peaceful societies, full human potential, and sustainable development. Empowering women leads to productivity and economic growth. Advancing gender equality is critical for reducing poverty and promoting health, education, and well-being. Human rights, including freedom from violence and socio-economic equality, should be enjoyed by all people. Studies have shown that many right holders especially those in rural areas are not aware of their rights and the need to demand the same from duty bearers who include the state and non-state actors and even within households.

The achievement of the 17 UN Sustainable Development Goals (SDG) is dependent on the operationalization and implementation of gender equality and women empowerment strategies, Human Rights Based Approaches (HRBA) and social inclusion is guided on the principle of Leave no one Behind. Restrictive gender roles and social norms a lived reality in most of the rural smallholder farms continue to drag development behind. While men and women continue to perform these roles as is, many of them lack awareness of how some of these community sanctioned roles continue to limit their progress in live especially among in creating wealth out of the agricultural value chains.

Intentionality in creating awareness among right holders to claim their rights, capacity building the duty bearers to meet the claims and ensuring those likely to be left behind like people living with disabilities (PWDs), the marginalized and the minorities among others are included would greatly contribute to common good, dignified lives and sustainable development.

This facilitator guide provides a lay out on how to train on the issues gender equality, human rights and social inclusion.

## 11.1 Module Summary

Module 11.0: Gender equality, human Rights and social inclusion			
Sessions	Training methods	Training materials	Time
11.1 Introductions and climate setting, objectives and expectations	<ul style="list-style-type: none"> <li>• Self-introduction</li> <li>• Setting Norms &amp; rules</li> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> <li>• Group exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Laptop</li> <li>• Projector</li> </ul>	20 minutes
11.2 Gender equality Definition of concepts	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Individual reflections</li> <li>• Group exercise</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand-outs</li> </ul>	30 minutes
11.3 The business case for gender mainstreaming	<ul style="list-style-type: none"> <li>• Practical exercise (groups tour nearby successful Agri- business where both a model couple)</li> <li>• Presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand-outs</li> </ul>	40 minutes

Module 11.0: Gender equality, human Rights and social inclusion			
Sessions	Training methods	Training materials	Time
11.4 Steps to mainstream gender	<ul style="list-style-type: none"> <li>Group exercise -same sex groups (trainees identify roles)</li> <li>challenge these roles</li> <li>Plenary discussions (share group work results)</li> <li>Individual reflections</li> <li>Presentations</li> </ul>	<ul style="list-style-type: none"> <li>Flips charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> <li>Participants' hand-outs</li> </ul>	40minutes
11.5 Human rights	<ul style="list-style-type: none"> <li>Individual reflections</li> <li>Buzz groups</li> <li>Plenary Presentations</li> <li>PowerPoint presentations</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> <li>handouts</li> </ul>	30 minutes
11.6 HRBA-PANT Principles	<ul style="list-style-type: none"> <li>Group work</li> <li>Presentations</li> <li>PowerPoint presentations</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> <li>handouts</li> </ul>	30 minutes
11.7 Social inclusion	<ul style="list-style-type: none"> <li>Buzz groups</li> <li>Plenary discussions</li> <li>Group discussions on who is likely to be left behind in the value chain</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> <li>handouts</li> </ul>	30minutes
Chapter review and discussion	<ul style="list-style-type: none"> <li>Discussion/conclusion Action plan</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> </ul>	30 minutes
<b>Total</b>			<b>4, hrs</b>

## 11.2 Guidelines for Facilitators





Module 11: Gender Equality, Human Rights and social inclusion	
11.0. Introductions, climate setting	Session guide
<p><b>Preliminaries</b></p> <p><i>The facilitator welcomes trainees to the Chapter and thereafter invites them to introduce themselves and state their expectations</i></p> <p><b>Expectations</b></p> <p>The trainees form groups (e.g., county based) and list expectations from the module</p> <p><i>The facilitator presents the chapter objectives.</i></p> <p><b>Objectives</b></p> <p>By the end of the training Chapter, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Explain and describe what gender and gender mainstreaming is with practical examples</li> <li>• Describe appropriate steps to take in operationalizing the PANT principles</li> <li>• Describe and list those likely to be excluded from the value chains.</li> <li>• Specify the correct actions to take to address the root causes of exclusion and how they will be monitored.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize the trainees expectations</li> <li>• PowerPoint presentations</li> <li>• Group exercise (listing and presenting expectations).</li> <li>• Expectations lists kept for later reviewing compliance</li> </ul>
<b>11.1 Gender equality definition of concepts</b>	

ANNEX I



DAIRY VALUE CHAIN TRAINING WORKSHOP FOR XXXX

TRAINING VENUE: XXX

DATES: XXX

SAMPLE PROGRAMME

Date and Time	Activity	Duration	Responsible

**ANNEX 11.: List of participants who validated this value chain manual**

<b>S/NO</b>	<b>NAME</b>	<b>INSTITUTION</b>
1	Joseph Kairu	County Government of SIAYA
2	Winston Motanya	County Government of KISII
3	Nicholas Manyinsa	County Government of KISII
4	Cecilia Mutuku	County Government of MACHAKOS
5	Paul Busienei	County Government of NAKURU
6	David Kimera	Youth Agri-Preneur
7	Lawrence Swanya	County Government of MACHAKOS
8	Kenneth Kagai	County Government of TRANS-Nzoia
9	Benedict Khanyifu	County Government of TRANS-Nzoia
10	Mwalimu Menza	Kenya Agricultural and Livestock Research Organization
11	George Kamami	County Government of MAKUENI
12	Moses Munialo	County Government of BUGOMA
13	Agesa Eric	County Government of KAKAMEGA
14	Benard Mainga	County Government of KWALE
15	Jane M Kamamu	County Government of KILIFI
16	Teresia Ndungu	County Government of NYANDARUA
17	Wilbur Mutai	County Government of UASIN-GISHU
18	Stephen Odipo	Kenya Agricultural and Livestock Research Organization
19	Solomon Mbivya	PAPA FARMERS Limited
20	William Mwangi	County Government of MAKUENI
21	Doreen Kinoti	Micro-Enterprises Support Programme Trust
22	Serah Nzau	Micro-Enterprises Support Programme Trust
23	Margaret Kikuvu	Micro-Enterprises Support Programme Trust





**MINISTRY OF  
FOREIGN AFFAIRS  
OF DENMARK**  
*Danida*

Micro-Enterprises Support Programme Trust  
MESPT Plaza, 01 Tausi Rd  
Westlands, between Westlands Rd & Muthithi Rd.  
P.O Box 187-00606 Sarit Centre.  
Email: [info@mespt.org](mailto:info@mespt.org)  
Tel: 0722 207 905 | 0735 333 154

