

# Dairy Farm Management

Training package for Dairy Extension workers



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**SNV**



DAIRY TRAINING CENTRE  
Developed with  
Dairy Training Centre

# **Dairy Farm Management**

Part I Training manual

Part II Training Guideline

## Preface

SNV Ethiopia, through EDGET project (Enhancing Dairy Sector Growth in Ethiopia, 2013-2018), engages in the capacity building, extension services and innovative support to the Ethiopian dairy sector particularly working with smallholder dairy farmers. The aim of the project is to increase milk production and productivity in order to double the income of the smallholder dairy farmers. EDGET is operational in the regions Oromia, Amhara and SNNP, and working with 65,000 dairy farming households.

The project works closely together with livestock regional bureaus and their respective zonal, woreda and kebele staff in delivering extension and other supports. One area of collaboration is the development of practical training and coaching tools and materials for extension workers based on a need assessment.

SNV has engaged the Netherlands based Dairy Training Centre (DTC) for the development of the Training package for extension workers. The documents were more elaborated and validated with the utmost contribution of high level experts from regional Livestock and Fisheries resources Development Bureaus/Agencies and Research Centers from the three operational regions of EDGET.

Overall nine training packages were developed on Breed Improvement and Fertility Management; Dairy Cattle Feeding and Nutrition Management; Dairy Cattle Health Management; Dairy Farm Management; Dairy Housing and Manure Management; Farm Economics; Forage Production and Management; Hygienic and Quality Milk Production; Young Stock Management.

This training package is on **Dairy Farm Management**.

SNV, also on behalf of the experts that contributed and DTC, would hope to see the materials widely used outside the project areas by all interested dairy development practitioners. The materials will be available in hard copies and soft copies including on SNV website [www.snvworld.org](http://www.snvworld.org) and other relevant websites.

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## **I. Farm Management Training Manual**

### **1. Introduction**

#### **1.1 Background**

Dairy production is an important component of livestock farming in Ethiopia. The milk production systems in Ethiopia can be classified in to four: Highland smallholder, Pastoralism, Urban and Peri-urban and Intensive dairy farming.

#### **Highland smallholder dairy production system**

- The production system is predominantly subsistence smallholder mixed farming, crop and livestock husbandry typically practiced within the same management unit.
- The majority of milking cows are indigenous animals which have low production performance.
- The feed requirement for dairy farming is derived from native pasture and a balance comes from crop residues and stub grazing.

#### **Pastoralism**

- It is the major milk production system in the low land part of Ethiopia.
- Livestock production is the dominant form of production to sustain the livelihood of pastoral society
- Characterized by shortage of feed availability, due to rainfall variability. As a result, milk production is low and highly seasonally dependent.

#### **Urban and Peri-urban**

- This milk production system developed in and around major cities and towns, which have a high demand for milk.
- The main feeds sources are agro-industrial by products (Oil Seed Cakes, Bran, etc.) and purchased roughage.
- Compared to other systems urban and peri-urban production system have relatively better access to inputs and services provided by the public and private sectors, and use intensive management.
- Milk producers own both cross and indigenous breeds.

#### **Intensive Dairy Farming**

- Specialized dairy farming practiced by state sector and very few individuals on commercial basis.
- Most of the intensive dairy farms are concentrated in and around Addis Ababa and are based on exotic breed stock.

Both the pastoralist and smallholder farmers produce 98% of the country milk production. Whereas, the urban, peri-urban and intensive dairy farmers produce 2% of the total milk

production of the country. (MOA, 1994 E.C).

Even though Ethiopia has a huge potential for dairy development, the sub-sector has been hampered by multi-faced constraints that include – genotype, feed resource, access to inputs & services, dairy cattle management, access to dairy product markets, etc.

The Enhancing Dairy sector Growth in Ethiopia (EDGET) Project has been working for the last four years to address some of these constraints together with the Ministry of Livestock & Fisheries Resources Development and its line bureaus in the three operation regions (Oromia, Amhara & SNNPR).

Improving dairy farm management at smallholder farmers' level is among the constraints that got attention in the project. The project provided capacity development support to dairy extension service providers and dairy farmers as one of the approach to realize this. The preparation of this module is continuation of this effort. The module is prepared for dairy extension service providers at different level to scale up and sustain the changes brought by the project in the area of dairy cattle management. The module is organized in five chapters/sections. The first chapter provides background for the module. The second & third chapter introduce dairy farm management functions and areas, respectively. In the fourth and fifth chapter the module discuss about farm recording and analysis.

## **1.2 What is Farm Management**

When farmers are asked whether they consider themselves managers, they all will confirm that indeed they feel themselves as such. When you also ask them what tasks they specifically do as a manager, what it is to be a manager and what makes them different from farm workers the answer is usually not clear.

Before we define what farm management mean, it is important to first understand what is farm. A farm is an economic unit (firm) where inputs are transformed into outputs through an interaction between natural and man-made factors. A combination of inputs, also called productive resources or factors of production, are usually employed in various proportions using the managerial expertise of the operator of the business who may be called a manager.

Farm management is defined as *"a decision-making process in which the available but limited production resources are allocated to selected production alternatives, so as to operate the farm business in such a way as to attain some set objectives"*. The objective could be profit maximization and/or achieving some other issues.

## **2 Dairy Farm Management Functions**

Similar to other management responsibilities, dairy farm management includes three key management functions. These are Planning, Implementation and Monitoring & Evaluation [Controlling].

For theoretical purposes, it may be convenient to separate the function of dairy farm management but practically these functions are overlapping in nature i.e. they are highly inseparable. Each function blends into the other, and each affects the performance of the others.

## 2.1 Planning

Planning is the basic function of dairy farm management. It is deciding in advance - what to do, when to do & how to do. Planning is also a systematic thinking about ways & means for accomplishment of pre-determined goals. It bridges the gap from where we are & where we want to be.

The planning function of dairy farm management includes the following components:-

- Assessing internal and external situation of the dairy farm;
- Setting objective;
- Strategy design;
- Activity design and resource planning and;
- Developing key performance indicators and monitoring methods

Below we will explain each elements what & how need to be done.

### 2.1.1 Assessing internal and external situation of the dairy farm:

The planning process starts from assessment. Assessment looks at the whole farm system to identify and prioritise key issues, opportunities and options for change. It can be done using analysis of farm performance recordings and benchmarking data, on-farm observation and a structured discussion with the dairy farm team or family members engaged in the farm. The two most important tools that can be used to do dairy farm assessment are problem/objective analysis and SWOT analysis.

#### (A) Problem Tree Analysis:

Also called problem analysis or situational analysis. It helps to find solutions by mapping out the anatomy of cause and effect around an issue or core problem. Problem tree analysis is best carried out in a small focus group of about six to eight people using flip chart paper or an overhead transparency.

The steps followed during problem tree analysis are the following:-

- The first step is to discuss and agree on the **core problem or issue** to be analyzed. This becomes the 'focal problem'. Do not worry if it seems like a broad topic because the problem tree will help break it down. In addition, the wording does not need to be exact as the roots and branches will further define it, but it should describe an actual issue about the farm. The core problem is the '**trunk**' of the tree.
- The second step will be identifying the causes of the focal problem. These become the **roots**.



Figure 1: Management functions

- The third and final step will be identifying the consequences or effects of the core problem, which will be the **branches**.

The heart of the exercise of problem tree analysis is the discussion, debate and dialogue that is generated as factors are arranged and re-arranged, often forming sub-dividing roots and branches.

The Problem tree is closely linked to the Objectives tree, another key tool in dairy farm planning. The Problem tree can be converted into an objectives tree by rephrasing each of the problems into positive desirable outcomes - as if the problem had already been treated. In this way, root causes and consequences are turned into root solutions. The solutions will be quickly turned in to key farm improvement entry points. These objectives may well be worded as objectives for change.

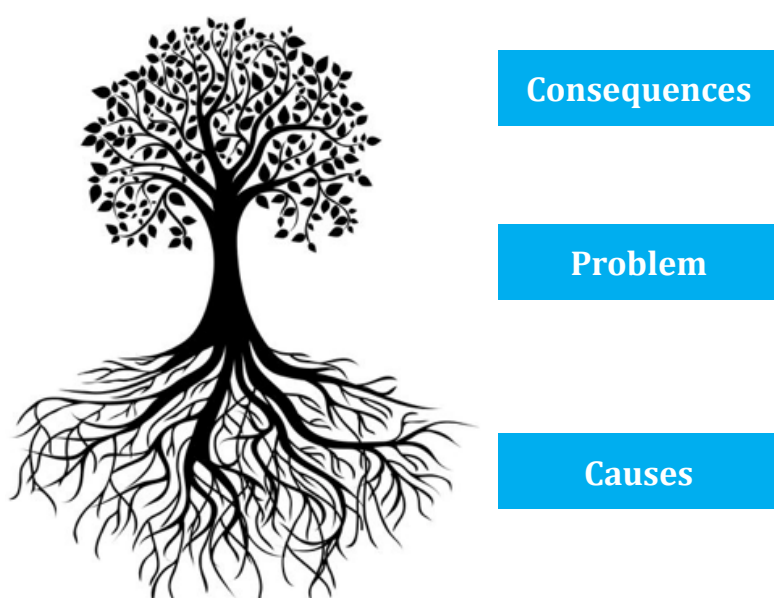


Figure 2: Problem tree analysis

**Example:** Refer Annex 1- Problem Tree analysis

## (B) SWOT Analysis

SWOT analysis is a process that identifies the dairy farm strengths, weaknesses, opportunities and threats. Specifically, SWOT is a basic, analytical framework that assesses what a farm can and cannot do, for factors both internal (the strengths and weaknesses) as well as external (the potential opportunities and threats).

### Elements of a SWOT Analysis:

A SWOT analysis is usually presented as a square with each of the four areas making up one quadrant. Each quadrant represents one element of the SWOT analysis - Strengths,

Weaknesses, Opportunities, and Threats. This visual arrangement of the information provides a quick overview of the farm's position.

**Strength:** describe what a dairy farm excels at and separates it from other comparable farms in the area. It includes:

- What advantage the farm has;
- What the farm do better than others;
- What do other farmers at your level consider as your farm strength;
- What does the farm do well

**Weakness:** Attributes of the farm that could affect performance or achievement of the farm objectives. Factors that limit the farm to operate at optimal level. It includes:\_

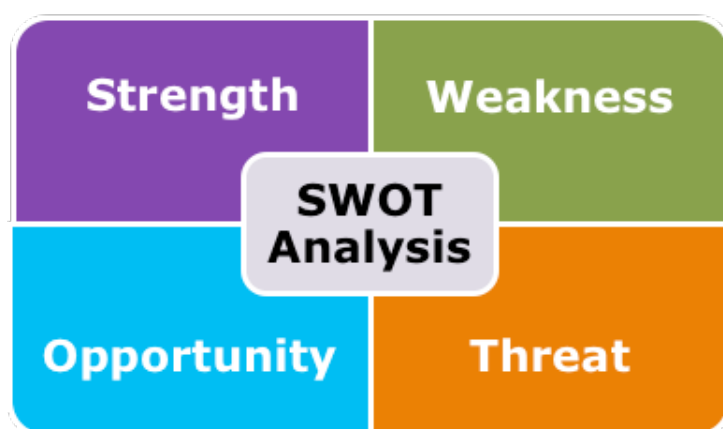


Figure 3: SWOT Analysis

- Areas that need improvement;
- What resources the farm lacks;
- Gaps that contribute to the loss/reduction of farm profit ;
- What other farmers/farms consider as weakness of your farm.

**Opportunity:** Favourable external factors that the farm can use to grow or improve. It includes-

- Favorable government policy, regulation;
- New technology and innovation;
- Socioeconomic changes - population growth, economic growth, new market opportunities, change in life style.

**Threat:** External factors that could damage or slow down the performance of the farm. It includes:

- Unfavorable government policy and regulation;
- Economic crises;
- Bad weather condition and other climatic conditions;
- Political risks such as war, riot, and civil disobedience.

### 2.1.2. Setting Objective

Objective is a specific result that a person, a system or a business entity would like to achieve in a specified period and with allocated resources. Objective setting is a very important process in the planning process. Objectives serves as a basis for creating common understanding among different stakeholder on what is expected to be achieved and to compare performance with plan.

In dairy farm management setting objective could be done for the enterprise / dairy farm/ as a whole [for example generating a certain amount of income), but also for specific components of the farm. That include Fodder production, conservation, storage and feed supply, Feeding Management, Milking and milk production, young stock rearing for replacing culled and sold dairy cows, Breeding and Fertility Management, Health Management, and Housing & manure management.

Objectives should also fulfil the SMART Criteria (Specific, Measurable, Achievable, Realistic and Time bound).

### 2.1.3 Strategy Design

Once we set objectives for the farm, the next step in the planning process is designing strategy to realize those objectives. Strategy is the method or approach chosen to bring the achievement of the desired results or objectives.

### 2.1.4 Activity Design and Resource planning

This is the final step in the planning process. Here we develop specific operational activities

#### Example:

- Increasing annual income from the dairy farm by 10% in the coming three years [2017-2019].
- Sourcing 40% dairy cattle feed from fodder production by the end of 2017.
- Increasing farm milk production from 20 lt./day to 40lt./day in the next two years.
- Increasing average milk production per cow per day from 5 lt./day to 10 lt./day by the end of 2018.
- Replacing all culled and sold dairy cows within the next 2 years.

the farm will undertake to achieve its objectives, along with the implementation timeframe, required resource, and responsible person.

The resource planning will identify:

- What is required?
- How much is required and
- From where the required resource will be obtained (source)

## 2.2 Implementation

Implementation is execution of planned activities as per the schedule and allocated resources to bring the intended results. Implementation function includes the following key responsibilities:-

- Fulfilling the necessary human and non-human resources required to realize the farm objectives. The resources could be mobilized internally or from external source;
- Organizing and leading the farm human resource in an efficient and effective way

## 2.3 Evaluation & Control Function

Evaluation & control function of dairy farm management includes three key steps: Measuring performance, comparison of plan versus achievement, and taking corrective action. Evaluation & control processes are commonly combined in dairy farm management. They are combined because they are intertwined process in which the farm (farm owner) asks how it is doing and what does it need to change to be successful. The basic question to be asked in each of the processes is presented below:-

### 2.3.1 Evaluation:

The evaluation process asks the following three key questions:-

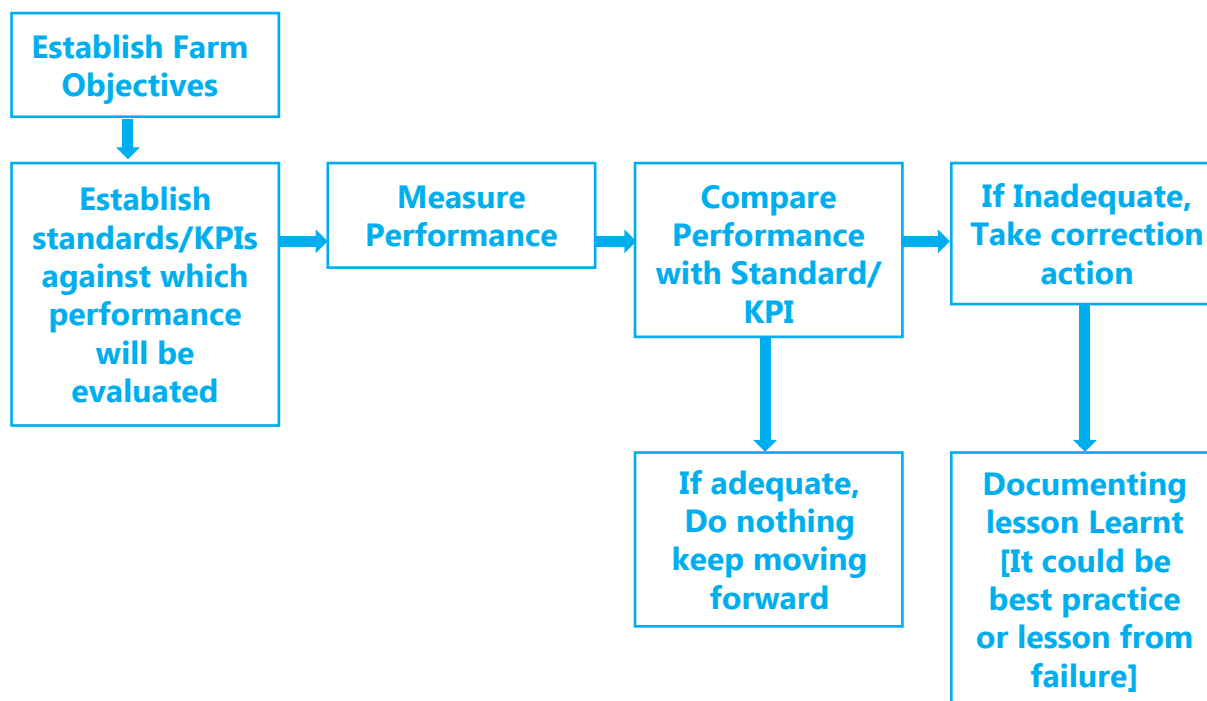
- *Where are we now in comparison with where we want to be (plan)?*
- *What lies ahead that can affect the farm either positively or negatively?*
- *Where will we end up if we continue on the current path?*

Answering these questions is what we mean by evaluation. The process provides what we call "gap analysis".

### 2.3.2 Control:

After the farm (farm owner) has evaluated its performance, the farm(farm owner) should answer the question " *what changes need to be made, how and where?*". The decision to make changes or not is the beginning of the control process.

The following figure provides summary of the evaluation and control process.



### 2.3.3 Key activities in the Evaluation and Control function:

The specific activities in Evaluation & control function includes

- Determining if the farm is achieving the desired objectives;
- Ensuring the objectives and associated strategies are relevant at all time in the course of implementing the farm plan;
- Doing periodic gap analysis between what is planned and achieved;
- Enabling the farm to be flexible as the farm environment changes;
- Ensuring appropriate control mechanism for the different farm management areas, personnel, financial and other strategic issues;
- Design a support structure for evaluation & control process with in the farm;
- Finding and sharing farm best practice

At last, it is worth mentioning that evaluation & control process requires a clear plan and measurable targets.

### 2.3.4 Key Performance Indicators

Key Performance Indicators (KPIs) are diagnostic and benchmarking tools allowing dairy farmers to improve their farm. KPIs have the following importance:-

- KPIs are used to assess the financial (such as farm profitability, farm cost, etc.) and technical ( milk production, calving interval, etc. ) performance of the farm;
- Farmers can use KPIs to identify weaknesses as well as to have specific targets for each farm management components;
- KPIs provide good insight about efficient utilization of farm resources and farm personnel skills



KPIs have two components:

1. What we want to measure and
2. What level of performance we anticipate/would like to achieve

Not all KPIs are relevant to all farmers. Therefore, it is important to prioritize when an extension officer provides advice. Issues that need to be considered to prioritize KPIs includes-

- KPIs relevance to farmer's current stage of dairy farm (eg. Herd size);
- Farmer's ability to interpret the data and use in decision making;
- Simplicity, ability and accuracy of collecting data necessary to determine KPIs. Ability of data collection depends on management skills, level of education, and farmer's motivation to use KPIs in their decision-making.

### **Selected KPIs that can be used for Ethiopian smallholder farmers**

The following table list selected KPIs for the different farm management areas:

Table 1: Key Performance Indicators

<b>Key Performance Indicator</b>	<b>Measurement unit</b>
<b>1. Herd Management</b>	
Percent of productive cows	%
Herd Structure (% of replacement heifers, Cows older than 4, 6, 8 years, Type of breed [cross breed/local breed], etc.)	Number, %
Herd size	Number
<b>2. Feed and Feeding Management</b>	
On farm forage production	Ton, hectare/m <sup>2</sup>
Proportion of feed covered from on farm source (on farm forage production, other sources such as crop residue, natural pasture...)	%
Availability of good quality forage for cows feeding	Number of month per year
Total feed cost	% of total dairy farming cost, amount in ETB
<b>3. Young stock Management</b>	
Average weaning age of female calf	Days
Average age of heifer at first insemination	Month
Average age at first calving	Month
Regular access to clean drinking water	Yes/no
<b>4. Milk Production</b>	
Proportion of adult cows actually milking	%
Average milk production per cow per day	Liter
Average lactation period	Month/days
Farm milk production per day/month/year	Liter
Cows with milk production performance record	%, number
<b>5. Fertility Management</b>	

Key Performance Indicator	Measurement unit
Time from calving to first heat	Days
Average service per conception	Number
Cows conceiving to Artificial Insemination	%
Average inter-calving interval	Month
Average gestation period	Days
Cows aborted	%
Cows with breeding performance record	%, number
<b>6. Health Management</b>	
Cows/heifers with health records	Number, %
Cows/heifers received internal & external parasite prevention	Number, %
Cows free of mastitis	Number, %
Cows/heifers with health problems	Number, %
On farm mortality rate	Number, %
<b>7. Housing &amp; Manure Management</b>	
Waste disposal rate	Day
Percent manure used for biogas	%
Type of bedding used	Type
Amount of water used for cleaning	liters
<b>8. Milk Processing &amp; Marketing</b>	
Milk soled	liters
Butter produced	kg
Milk product sold	Kg/liters

### 3. Farm Management Areas

There are seven major dairy farm management areas, a farmer/farm manager should take care. The diagram below depicted all these management areas.



*Figure 4: Dairy Farm Management Areas*

A brief description of what each farm management areas mean, objectives to consider and key activities/best management practices are given in the next sections.



### 3.1 Forage Production Management

Forage production management covers all activities from 'seed to feed', including major agronomic practices for forage production, forage conservation, storage and feed supply.

**Objective:** The main objective of forage production management is ensuring year round forage supply for the farm, and covering more feed from on farm forage production.

#### Key activities/management best practices:

- Selection of appropriate forage species (Based on agroecology suitability, available land for forage production, needed biomass & nutritive value for the different types of dairy cattle, etc.);
- Manage the forage with good agronomy practices ( from land preparation up to harvesting) to optimize growth & quality;
- Harvesting and feeding the forage at the best stage of maturity for nutritive value; and
- Ensuring year round forage supplies.

### 3.2 Feed & Nutrition Management

Feed and nutrition management is the process of understanding the nutrient requirement of dairy cattle at different growth and lactation stage and combining various feed ingredients to meet these needs in a cost effective manner.

Dairy cattle nutrition management is a very important farm management area for two reasons:

1. Nutrition plays a very important role to maintain health and productivity of dairy cattle;
2. Feed is a big part of the cost to produce milk, nearly 60-70%.

Since feed is major variable cost that has direct influence on the amount of milk and cost of milk production, it needs a careful management from farmers/farm owners' side.

#### Objective:

- Keeping dairy cows in good condition
- Maximize milk production potential of dairy cows
- Fulfilling nutrient need of dairy cattle in a cost effective way



### Key activities/management best practices:

- Dairy cow should eat as much good quality forages as possible. The more nutrition we can provide inside the forages, the less concentrate we need to add, the cheaper the diet;
- Clean, tasty and fresh water should be available at all time. Cows need a lot of water.
- New feed stuff or ration should always be introduced gradually.
- Nutritional requirements vary with the stage of lactation. Hence, feeding regime should vary accordingly.
- Make sure the diet contains adequate/appropriate proportion of Concentrates and roughage.
- Feed the highest quality feeds available
- Supplement minerals from available sources

### 3.3 Fertility Management

Good fertility management is potentially one of the most effective means of improving the sustainability, efficiency and profitability of dairy farm. Good fertility management means cows must calve at the right time of the year, must be seen in heat, served efficiently and got in-calf as quickly as possible.

**Objective:-** Objective of fertility management includes:-

- To produce enough replacement;
- To improve dairy herd productivity;



### Key activities/management best practices:

- Identifying breeding objective, cost effective & efficient breeding options
- Identifying which cows are on heat that requires consistent observations, including night-time observations.
- The nutritive requirement for reproduction should be adequately supplied;
- Accurate records/memories on the reproductive status of each cow are essential for efficient fertility management;
- Milking cows need to be well fed to rebreed. If cows are too thin or over fat, they will have poorer fertility.
- Evaluate periodically the status of the herd



### 3.4 Young Stock Management

Sufficient young stock reared will mean that no animals need to be bought from outside the farm. This will reduce the risk of bringing diseases to the farm and also increased the farm profitability and sustainability.

#### Objective:

- Rearing enough young stock (pregnant heifers) in order to replace all culled dairy cows;
- Reducing Average age at first calving
- Reducing Mortality rate of calves up to 2 weeks of age

#### Key activities/management best practices:

- Calves must be born under hygienic conditions. Calving cows must be provided with a clean dry area in which to calve down.
- The calves' umbilical cord should be sprayed with iodine solution (7%) immediately after birth.
- Calves must be given a good drink of quality colostrum early in their lives. Each calf should receive 4 L of colostrum within 6 h of birth.
- Calves must be always provided with adequate clean drinking water.
- Calf should have a separate pens and should constructed with good natural ventilation against heat stress and also protection from any severe cold weather conditions.
- Permanent identification of each calf (with an ear tag) and good record keeping will always benefit the farmer in the long run.
- Weaned heifers require a balanced diet of quality roughages and concentrates. The feeding varies with the age of the calf.
- Well-reared heifers will show signs of heat early.



### 3.5 Housing & Manure Management

#### **Good Housing + Good Management = More Milk**

A pressing, and often-overlooked matter that poses a significant challenge on most of today's dairy farms is maintaining cow comfort. There are a wide variety of environmental stressors that must be taken into consideration in a dairy farm management, and they have a direct impact on the production level of the cows. Some of these stressors include; heat stress, poor ventilation, improper stall/feed-bunk design, and not having adequate access to water. Conditions such as these are not only stressful to the cows, but also greatly affect their physiology and productivity.

Many of the farm management aspects such as feeding, breeding, quality milk production, disease control, easiness for manure handling, household labour division & workload, etc. are invariably influenced by the type of housing the farmer has for the dairy animals.

#### **Making the most from Manure:**

It is important to realize that manure is a precious 'waste' product. Manure is a natural fertilizer and source of energy. Hence, it needs to be managed well.

**Objective:** Objectives of good housing and manure management include-

- Improving productivity of dairy animals by reducing different kinds of stress;
- Clean milk production
- To protect animals against theft, predators, climatically threats and from organism that will cause health threats.
- Effective collection and use of manure and urine

#### **Key activities/management best practices:**

- Using zero-grazing housing and feeding system
- Having well-designed dairy animals housing, constructed with available local materials, with good air ventilation & lighting, well placed feeding troughs, walkways and resting stalls, comfortable lying surfaces and non-slip walking surfaces, etc.
- Cows need a soft bedding, which is kept clean and non-slippery.
- The farm need to have well integrated manure collection and discharge/use mechanism.

### 3.6 Health Management

Health management is very important to ensure the optimal care and well-being of dairy cattle and to reduce losses in productivity caused by disease and mismanagement.

Livestock health is often discussed in terms of the whole herd. That is because whether you have 2 cattle or 200, what distresses one easily can affect the others. Therefore, the health of each animal on the farm is equally important.

Another important thing is that the farm/farmer cattle management is the key to the herd's health.



### **Objective:**

- Keeping animals in good health condition and improve animal welfare;
- Reducing production inefficiency/loss as a result of health problems;
- Producing safe & clean milk

### **Key activities/management best practices:**

- Regular and scheduled monitoring of dairy animals health condition;
- Detecting health problems before they become economically significant;
- Vaccination should not replace good management;

### **3.7 Hygienic Milk Production and Marketing**

Maintaining a high standard of hygiene is one of today's most important milk production objectives. Attention to hygiene will ensure high quality milk produced from healthy animals. High quality raw milk leads to a satisfactory economical gain to dairy farmers.

From public's health point of view, milk is a very good media for bacterial and other micro-organisms development. As such, disease hazard in public can easily be predisposed by infected milk during production, handling and marketing.

As a business, milk which is not available for human and economical use is a loss to the producing farmer.

### **Objective:**

- To ensure milk is produced in clean and hygienic conditions so that it is fit for human consumption.
- To minimize economic loss due to milk which is not used for household consumption and/or sales.





## Key activities/management best practices:

- Ensure proper feeding and housing for clean milk production:
  - Cows should be kept clean and dry, under comfortable conditions.
  - Animal feed should be clean and nutritionally sound with all the required nutrients in the right proportions and free from contamination.
- Maintain good animal health management for hygienic milk; production. Healthy animals are the primary source of clean milk;
- Managing the hygiene of milking equipment and utensils for clean milk production;
- Wash udder, teats and flank of the animal with clean water preferably add a disinfectant. Wipe with a clean cloth;
- Check for mastitis before milking with a strip cup or any other method.
- Maintain milker hygiene;
- Keep milking environment clean and comfortable;
- Store milk in cool and clean place;
- Milk should be delivered to the market as soon as possible;

## 4. Dairy Farm Recording

Record keeping is a necessary element of good dairy management. With no written records, farmers have to depend on their memory while making decisions regarding their farm practices. But, memories can become unreliable after a few days, months or years.

Therefore, no matter how good someone's memory is, it has no substitute for having recordings of information on different aspects of the dairy farm

### 4.1 Why dairy farm recording?

Farm records are like the progress report cards students get at school. Dairy farm record keeping has the following importance:-

- Dairy farm records provide the basis for tracking & evaluating performance.
- Provide up to date information for decision making at different level and aspects of the farm.
- Helps in overall better supervision and management of herd.
- Helps in determining the income and expenditure (economics) of dairy farm.
- Helps in estimating the cost of milk production.
- Helps to compare the herd performances in different years
- Helps to identify problems/gaps and setting future goals/directions for the farm.
- Inform farmers about strengths and weaknesses in their farm operation.



## 4.2 Criteria for good record keeping

If records are not to be more troublemakers than they are worth to farmers, they should satisfy the following criteria:

- **Records must be useful:-** Unless data which is being recorded will at some future time be used (turned in to information) in making management decisions, it should not be recorded at all.
- **Records must be kept in such a form that they can be easily converted into information:** - Before keeping a record, the eventual end use must be decided upon so that the form in which the data are recorded will facilitate later analysis and interpretation. Too often, the end use is not considered, and the usefulness of the data is severely impaired.
- **Record keeping systems must be simple:** - Dairy farmers have enough to do without burdening themselves with complex record keeping systems, which are difficult to understand and time consuming to complete, and therefore nearly impossible to delegate to employees.
- **Duplication must be avoided as much as possible:** - Some data may have to be recorded more than once in different forms, but this must be reduced to a minimum.
- **Records must lead to actions being taken:** - Information must lead to quick actions. Unless a record is specifically intended to be used for some future action or in management planning it should not be kept.

These criteria should be followed when an extension officer recommend the different types of recording an individual farmer should maintain.

## 4.3 Types of dairy farm recordings

There are different types of dairy farm recordings. The following list provides the most applicable types of dairy farm recordings at smallholder farmer level in the Ethiopian context:

1. Animal Identification/history record
2. Breeding Record
3. Milk Production record
4. Feeding record
5. Young stock record
6. Financial record

### 4.3.1 Animal Identification/history record

Animal identification/history record provides information about major events occurred on individual dairy cattle from birth up to the time it leaves the herd (could be death, sales or any other reason).

**What need to be recorded:-** Animal identification/history record include – Animal Name or identification number, date of birth/purchase, breed type, calving period (month) for each calving interval, lactation period (days) for each lactation, lactation yield (average per day and total yield), date of drying, calf its sex & identification number, age when culled, date of disposal (sales/death).

**Purpose:** Animal identification record has the following purpose but not limited-

- Determining whether an animal is an appropriate size for its age;
- To evaluate overall herd reproduction and determining the age of heifers at first heat;
- Help to know the age at which a heifer should be targeted for breeding;
- Provides information to compare genetic lines across an area (with other dairy farmers) to determine which animals to cull;
- To determine which animal should be culled, on the basis of age.



#### 4.3.2 Breeding Record

**What need to be recorded :-** Breeding record shall include - Animal identification number/ name, birth date, name of sire and dam, heat dates, calving dates, earliest breeding date, service information, pregnancy examination, expected calving date, drying off date and any additional remarks.



#### **Purpose:**

The breeding record will help the farmer to improve his/her breeding management by being able to determine such matters as:- the date at which to dry a cow off; knowing when a cow should deliver a calf; highlighting poor insemination or bull services; establishing breeding dates and feeding programs; identifying calf, sire and dams; and determining the date for pregnancy testing.

#### 4.3.3 Milk Production Record

Milk production record captures the individual cow milk yield per day. These records are useful in measuring the performance of the herd and for the economic appraisal of the enterprise.



**Purpose:**

- Milk production records help the farmer determine which animals are contributing for the increase/decrease of average farm milk yield and therefore income from the herd.
- Good milk production records can assist to raise milk production from an individual cow and a herd through specific management for individual animals.
- Milk production recording informs the farmer what type of feeding strategy to follow, to which cow in the herd and when.

**What need to be recorded:** - Milking cow name or ID number, daily milk yield, and start & end lactation period/date.

**4.3.4 Feed & Feeding Record**

Two types of records can be kept: The first is about feed production & purchase and the second is about feeding.

Feeding records give information about the amount, type and quality of the feed provided to dairy animals. In addition, type and quantity of on farm feed production and feed purchased from outside sources

**Purpose:**

- Feeding records can be used both for day to day management and adjustment of the feed ration;
- Together with the production data, it can be used to adjust if a milking cow needs more concentrate, or help in decisions about examining animals which seem to not grow, but still eat very much.
- It can also be used for planning of activities related to feed production, purchase, conservation and establishment of grazing areas in the following season.
- Feed production/purchase record provide very important information on the proportion of feed produced and purchased. This informs the farmer to better manage the different sources of feed.



**What need to be recorded:-** For feed production/purchase – Type of feed, quantity of feed, purchased feed price. For Feeding:- Dairy cattle identification, Feed type, quantity of feed in take(average and total quantity)

**4.3.5 Young stock recording**

Young stock recording maintains the records key information of replacements (Calf & Heifer) at different period starting from birth.

**Purpose:-**

Young stock recording provides valuable information for growth monitoring of calves and heifers;



**What need to be recorded:-** Young stock recording include calf number, sex of the calf, sire number, dam number, birth weight, weaning weight, service weight, weight at calving, age at weaning, age at first service, age at first calving etc.

#### 4.3.6 Financial Recording

Financial recordings are records of the costs and earnings related to the dairy farming recorded for financial analysis and dairy enterprise appraisal.

##### **Purpose:**

Financial records are very important in providing the farmer with information concerning the profitability of his/her farm. Moreover, they are of great help in decision making at the right time. For example, is it profitable to feed concentrates, is it advisable to apply for a loan or credit to invest in a machinery or technology? Answering these questions is only possible if adequate financial records are available.

**What need to be recorded:-** Financial records include dairy farm asset, income/revenue, expenditure and sales records.



## 5. From Farm Recording to Analysis

The objective of "Farm Analysis" is to enable the farmer to identify weaknesses and strength in the technical and financial performance of his/ her farm. After identifying weaknesses and finding the root causes of sub-standard performances, the farmer can make well informed decisions and take action in order to improve his/ her farm performance.

The main source of information for the farm analysis will be the different records kept in the farm. These can be include- financial records, milk production records, fertility records, young stock rearing records, feeding records, etc.

Another important source of information is observing the farm, fodder crops, feed storage, animal condition, housing, young stock, farm hygiene, feed mangers, etc. These observations can be used to verify what is in the farm records. For example if milk production records show a low milk production it is usually verified by observing poor quality of dairy animals in a poor body condition with poor quality feed and feeding practice.

From the farm records all kinds of KPI's can be calculated and used as monitoring tools as well as for evaluation of the technical and financial performance of dairy farm.

As explained in section 4, measuring and recording dairy farm information is a very important part of farm management which is often neglected. However, recording for "*recording sake*" is not very useful. Records should be used to work out "key performance indicators" (KPI's) which can be compared to targets or benchmarks for judging the technical and financial performance of the dairy enterprise. In this way, the information recorded and the analysis done will provide the farmer/farm manager with real "management information".

Table 2 below, provides summary of types of farm analysis, examples of KPIs, source of information/data and use of the analysis.

Table 2: Summary of key Farm Analyses

Sr. No.	Types of Farm Analysis	Examples/KPIs	Data/Information source	What will the Analysis inform
1.	Production efficiency	<ul style="list-style-type: none"> <li>Average milk production per cow per day</li> <li>Farm total milk production per day/month/year</li> <li>Average lactation production per cow</li> <li>Average lactation length</li> </ul>	<ul style="list-style-type: none"> <li>Milk production record</li> <li>Animal identification record</li> </ul>	<ul style="list-style-type: none"> <li>Productivity of the whole farm and/or per cow</li> <li>What &amp; how to improve milk production, lactation length</li> <li>Testing the effectiveness of feeding, housing and other management improvements</li> </ul>
2.	Reproduction efficiency	<ul style="list-style-type: none"> <li>Average age at 1st calving</li> <li>Conception rate</li> <li>Age at first insemination</li> <li>Average calving interval</li> </ul>	<ul style="list-style-type: none"> <li>Fertility record, Young stock</li> </ul>	<ul style="list-style-type: none"> <li>To assess the effectiveness of different breeding methods used</li> <li>Inform the production and reproductive potential of the herd</li> </ul>
3.	Herd Replacement	<ul style="list-style-type: none"> <li>Average calf growth rate per month</li> <li>Growth rate at weaning</li> <li>Average age at weaning</li> <li>Average age at 1st service/heat</li> </ul>	<ul style="list-style-type: none"> <li>Young stock recording</li> </ul>	<ul style="list-style-type: none"> <li>Growth monitoring</li> <li>Management practice the farm should follow at different age/condition of young stock</li> <li>Inform evaluation of replacement strategy of the farm</li> </ul>
4	Financial profitability	<ul style="list-style-type: none"> <li>Gross/Net income</li> <li>Sales trend of major farm outputs</li> <li>Proportion of feed cost to total farm expenditure</li> <li>Per unit (lt.) production cost of milk</li> </ul>	<ul style="list-style-type: none"> <li>Income &amp; expense recording</li> <li>Sales recording</li> <li>Milk production recording</li> </ul>	<ul style="list-style-type: none"> <li>Inform whether the farm is profitable or not and by how much</li> <li>Sales trend of the farm outputs</li> <li>Which cost item contribute most to the farm expense and which source of income/revenue contribute most to the farm income</li> </ul>

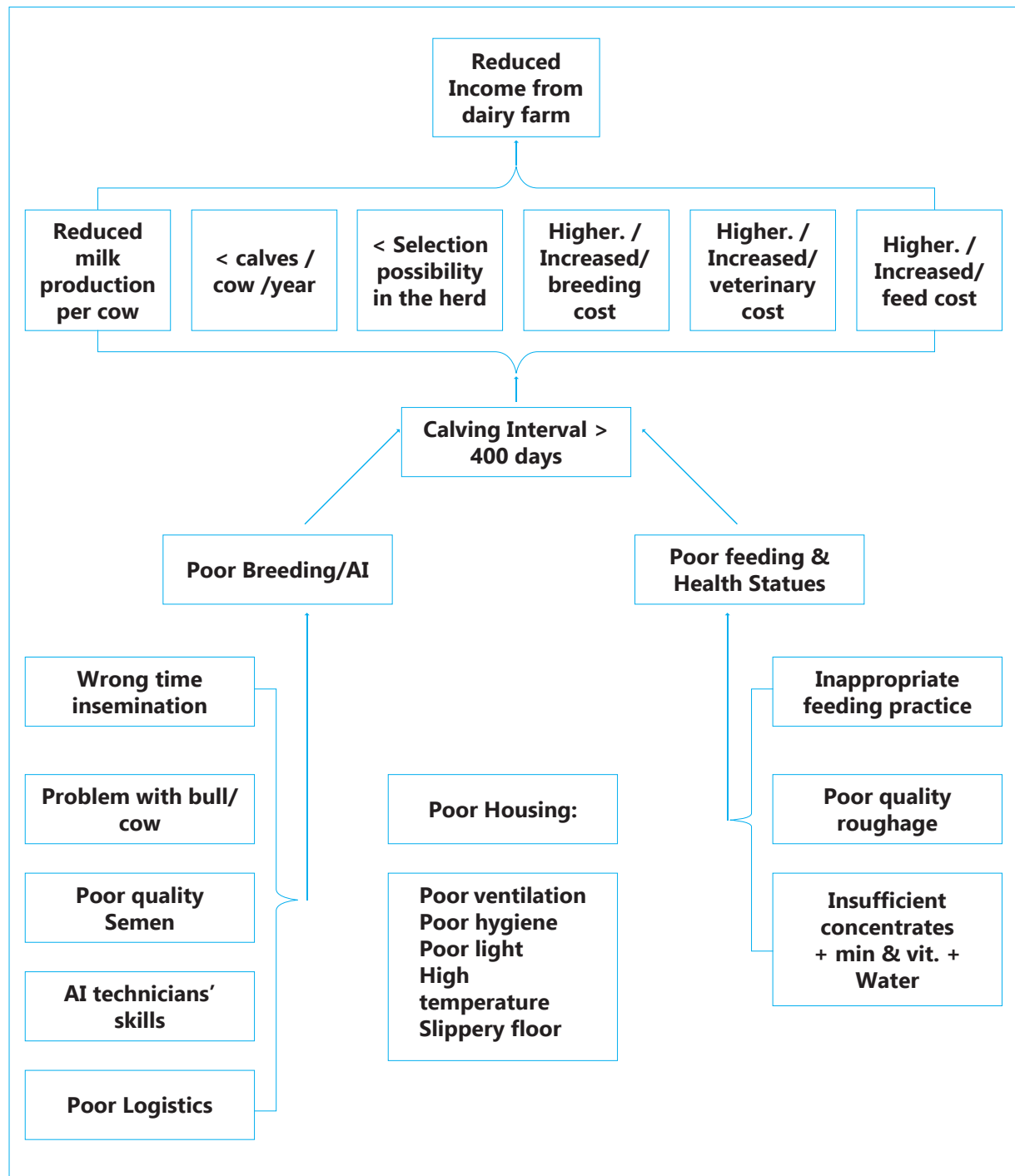
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## Annexes

### Annex 1: Problem Tree Analysis Example



## Annex 2: Monitoring tools commonly in use on commercial dairy farms

With time as a precious commodity the use of a few key “monitors” to judge whether the dairy farm is running smoothly, efficiently and profitably should become a routine on every commercial smallholder farm. The monitors to use are depending on the objectives of the smallholder dairy farm.

Monitor	Expected performance	Concern level
<b>Daily watch list</b>		
<b>Milk production</b>		
Average milk production per cow per day	Less than 5 % drop	> 5 % drop
Average milk production per day of individual cows	Less than 10 % drop	> 10 % drop
<b>Nutrition</b>		
Cud chewing	More than half of cows chewing cud	Less than half cows chewing cud
Dry matter intake	Drop of less than 5 %	Drop of more than 10 %
<b>Reproduction</b>		
Cows in heat vs expected in heat	Goal: > 70 %	Less than 50 %
<b>Milk quality</b>		
New clinical cases of mastitis		one and above case every 15 days per stock/herd
<b>Environment</b>		
Temperature and humidity	Record unusual temperature and humidity (Observation)	
<b>Weekly watch list</b>		
<b>Production</b>		
	Look for trends	Lower fat with stable or rising protein
<b>Nutrition</b>		
Silage hay, crop residue quality	Observation by Colour & odour	Different from trend ( Mouldy/brown)
<b>Reproduction</b>		
% of cows pregnant	> 70 %	< 60 %
<b>Milk quality</b>		

Monitor	Expected performance	Concern level
Organoleptic test	normal test & colour	colour & odour change from normal
<b>Monthly watch list</b>		
<b>Production</b>		
Check daily and weekly production levels	Check for trends	> than 5 % drop
% dry cows	< 20 %	> 20 %
Culling voluntary vs involuntary	< 50 % involuntary	> 50 % involuntary
Lame cows incidence	< 5 %	> 15 %
Body condition score	2.5 – 3.5 (normal)	Any cows out of range
<b>Reproduction</b>		
Heat detected	> 70 %	< 50 %
Conception rate	> 50 %	< 50 %
Pregnancy rate (heat detection % x conception rate)	20 – 25 %	< 18 %
Average number of days to first insemination after calving	90 – 120 days	> 120 days
<b>Milk quality</b>		
New mastitis infections	< 5 %/ month	> 10 %/ month
Number of cows treated	Less than 2 cases per stock/ month	More than 3 cases/ per stock / month
Somatic cell count trends	< 200000 or downward trend	> 300000 or upward trend

### Annex 3: KPI's which can be calculated from dairy farm records

	Reference level/ Benchmark *	2010	2011	2012
<b>Production Records</b> -Total milk production per year -Milk production per cow per day -Milk production/ cow/ lactation -Average lactation length in days -% milk in dry/ cold season -Milk price per litre -Average number of cows present -% dry cows	<b>10 liter</b> <b>3000 liter</b> <b>300 days</b>  <b>12</b>  <b>Max 20 %</b>			
<b>Fertility Records</b> Adult cows: -Calving interval -Calving % -Number of AI/ pregnancy -Interval calving – first heat -Interval calving – first insemination -Conception rate after first insemination -Non – return % after 56 days -% of animals with metritis  Young Stock: -Age at first insemination -Number of inseminations per heifer -Conception rate after first insemination -Non – return % after 56 days	<b>365 days</b> <b>80 %</b> <b>2</b> <b>45 days60 days</b> <b>60 %</b> <b>65 %</b> <b>Max 5 %</b>  <b>21 months</b> <b>Max 1,5</b> <b>Min 80 %</b> <b>Min 85 %</b>			
<b>Young stock rearing records</b> -Calf mortality up to 2 weeks after birth -Young stock mortality -Growth rates -Number of YS/ 10 cows -Average age at calving in months -Average body weight after calving	<b>Max 10 %</b> <b>Max 5 %</b> <b>See table</b> <b>Max 8</b> <b>30 months</b> <b>Min 80 % adult weight</b>			

	Reference level/ Benchmark *	2010	2011	2012
<b>Financial Records</b>				
<b>Sale prices dairy herd</b>				
-Culled milking cows	10,000			
	30,000			
-YS > 2 yrs	20,000			
-YS 1-2 yrs	10,000			
-YS < 1 yr	10,000			
-Breeding bulls				
<b>Feed costs</b>				
-Concentrate costs per kg	8 Br.			
-Concentrate costs per cow	4,500 Br			
-Roughage costs per ton	3,000 Br			
-Roughage costs per cow	7,700 Br			
<b>Fodder production</b>				
-Fertilizer costs/ hectare	1,500 Br			
-Fertilizer use/ acre	100 kg			
-Manure costs/ acre	500 Br			
-Manure use/ acre	4,000 kg			
Casual labour costs/ acre	5,000 Br.			
-Dry matter production per acre	9 tone			

	Reference level/ Benchmark *	2010	2011	2012
<b>Health RecordsMortality</b> -Calf mortality up to 2 weeks after birth % -Mortality YS % -Mortality % adult cows -Culling % adult cows -Replacement % adults  <b>% of cows culled for:</b> -Production -Mastitis -Fertility problems -Hoof/ leg problems/ lameness -Metabolic problems -Other  <b>Mastitis</b> -% new cases/ month -% clinical mastitis/ month  <b>Metabolic diseases incidence rate in % of total number of cows present</b> -Milk fever -Ketosis -Rumen acidosis -Displaced abomasum -Laminitis  <b>Body condition score</b> -After calving -Fresh cows 60 – 90 days in milk -Dry cows	Max 10 %  Max 5 % Max 2 % Max 10 % Max 20 %  Max % Max 5 % Max % Max 2 % Max 2 % 3 %  One case every 15 days per herd/ stock  Max 5 Max 5 0 Max 5 Max 5  3.0 – 3.5 2.5 – 3.0 3.0 – 3.5			
<b>Labour productivity</b> -Total number of labourers - Kg milk/ labourer family labour -	200 lt/labourer/ day 5 person In line with labour availability			

\* Benchmarks are based on the average level of a smallholder dairy farm keeping F1 crossbred cows (Local x HF)

#### Annex 4: Financial and economic performance indicators in Dairy Farming

Parameters	Absolute figures			Per 100 kg FCM		
	2010	2010	Benchmark *	2010	2015	Benchmark *
<b>Revenue</b> -Milk sales per day/month/year -Livestock sales and growth of the herd Manure/cow dung sales -Other <b>Total (a)</b>						
<b>Feeding costs</b> -Concentrates -Roughage -Milk replacer -Other feed costs <b>Total (b)</b>						
<b>Costs dairy cattle</b> -Health care services -Medicines -AI and breeding services -Cubicle litter -Other costs dairy cattle <b>Total (c)</b>						
<b>Costs fodder crops</b> -Chemical fertilizers -Seed -Herbicides/ pesticides -Casual labour -Fencing -Cleaning Manure/compost -Other <b>Total (d)</b>						
<b>Total variable costs</b> <b>(b + c + d) = (e)</b>						
<b>Gross margin dairy farm (</b> <b>a – e) = (f)</b>						

Parameters	Absolute figures			Per 100 kg FCM		
	2016	2015	Benchmark *	2016	2015	Benchmark *
<b>-Gross margin farm</b>						
<b>Total = (a)</b>						
<b>Fixed costs</b>						
<b>-Paid wages</b>						
<b>-Contract work</b>						
<b>Maintenance and:</b>						
<b>-Machines-Land/ buildings and installations</b>						
<b>-Water/ El./ gas</b>						
<b>-Property taxes</b>						
<b>-Overhead costs</b>						
<b>-Rent of land</b>						
<b>-Depreciation buildings and installations</b>						
<b>-Depreciation machines</b>						
<b>-Paid interest</b>						
<b>Total (b)</b>						
<b>Nett farm income (a – b)</b>						
<b>Cash flow</b>						
<b>Nett farm income + deprecia- tion</b>						
<b>Total</b>						



## Animal Identification/History Record

33

## Annex 6. Breeding Record

[illegible]

## Annex 7. Milk Production Record

[illegible]

### Annex 8 On farm feed production/ purchase record

[illegible]

Annex 9 Feeding Record

Type of Feed	Unite of Measurement	Feed In take per day per cattle											
		Cattle 1		Cattle 2		Cattle 3		Cattle 4		Cattle 5		Cattle 6	
		Name/ID	Qty.	Name/ID	Qty.	Name/ID	Qty.	Name/ID	Qty.	Name/ID	Qty.	Name/ID	Qty.

Annex 10 Income & Expenditure Record

Income/Expenditure Items	Amount in ETB per Month												Remark
	September	October	November	December	January	February	March	April	May	June	July	August	
I. Income/Revenue													
Sales of dairy products													
Sales of Dairy animals													
Bull service													
Salse of dung/bio-slurry													
Sales of forage seed/feed													
Total Income/Revenue													
II. Expenditure													
Feed													
Veterinary service (including Medicine & vaccination)													
Breeding Service													
Construction/Renovation of housing and feeding trough													
Hired Labour													
Interest Payment													
Different supplies													
Total Expenditure													

Annex 11 Dairy Farm Out put Sales Record

Type of Products	September			October			November			December			January			February			March			April			May			June			July			August			Total annual sales
	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	Qty.	Unit Price	Total sales	
Dairy Products:																																					
Whole milk																																					
Butter																																					
Ayib/Cheese																																					
Forage seed																																					
On Farm produced feed																																					
Dairy Animal																																					
Cow dung/ bio-slurry																																					

## Annex 12 Young stock recording

[illegible]



# **Farm management Training Guidelines for Dairy Extension workers**



## II. Farm Management Training Guideline

### A. Module book

#### Introduction

The module Farm Dairy Management is part of the Dairy Development Training packages introduced By SNV Ethiopia as part of the EDGET Project. This module has been prepared by the project staffs in close collaboration and active participation of GoE experts at different level.

The EDGET project objective is to improve smallholder dairy farmers' farm management there by increasing household income from dairy through increased milk production and marketing. The Module Dairy Farm Management will help the dairy extension workers to acquire the knowledge and skills to manage a dairy farm and to assess/ benchmark the technical and financial performance of small holder (dairy) farmers. They will also be given "tools" for analysis of sub-standard performance which will enable the extension workers to advise farmers how to improve their situation.

#### Professional situation

As an extension worker you usually have to advise small holder farms on how to manage their livestock in the most optimal way particularly the dairy enterprise.

A small holder dairy farmer in Ethiopia has to manage his/ her dairy farm unit/ enterprise in the most optimal way given his/ her specific circumstances. This also means that the farmer has to determine the objectives of his/ her dairy enterprise, has to develop action plans for achieving these objectives, has to develop tools for monitoring and evaluation, in short applying the so-called "management cycle".

Small holder farmers, however, usually have indigenous knowledge and skills to run the dairy enterprise, will try to avoid risk as much as possible and are unaware of applying this "management cycle".

As an extension worker you have the knowledge, skills and innovations to manage a dairy enterprise in the most optimal way and you have the motivation and "drive" to convince small holder dairy farmers to improve on their knowledge and skills in order to improve the technical and economic performance of their dairy enterprise.

As an extension worker you are able to calculate "key performance indicators" from records the farmer has kept. If no records are kept you are able to analyse the technical and financial performance from observations made on the farm and information provided by the farmer and his/ her family. As an extension worker you know the "reference level" or benchmarks of these "key performance indicators".

As an extension worker you are able to assess/ benchmark the economic and technical performance of dairy enterprises using available farm records/ farm observations and analyse sub-standard performance. Because of this analysis you are able to advise dairy farmers on the most optimal ways to improve their performance depending on the farmer's objectives, circumstances and preferences.

But you (and the owner) have other responsibilities as well; how to deal with environmental and social issues. In the end any business is only really sustainable if it is taking into account the three P's; People, Planet & Profit.

## Required entry qualification

To take part in this module on Management you should comply with the following entry requirements:

- Competent in the English language
- Have completed the other training modules included in the training program successfully
- Competent in basic calculation skills
- Have basic insight/experience in managing smallholder dairy farms

## Specific objectives and related topics

**A)** At the end of the course participants are able to explain what it means to be a “farm management” with specific focus on dairy farming.

Related topics are:

- Introduction to dairy farm management

**B)** At the end of the course participant will better understand dairy farm management functions and management areas.

Related topics are:

- Dairy Farm management functions
- Farm management areas

**C)** At the end of the course participants can calculate relevant KPI's, including financial ones, from farm records and benchmark them.

Related topics are:

- Farm analysis/calculation of relevant KPI's for small holder dairy farms based on farm records and compare with bench marks
- Identify sub- standard performance

**D)** At the end of the course participants will understand importance of dairy record keeping and able to do the different recordings'

Related topics are:

- Dairy farm recording

**E)** At the end of the Course participants are able to analyse sub-standard technical and/ or financial performance of small holder dairy farms and make an action plan for improvement

Related topics are:

- Dairy Farm analysis

## Assessment

During the course one assessment will be conducted to measure the competence level of the participants to advise a small holder farm on his/ her technical and economic performance. The assessment will be a group assignment.

The group (maximum 5 persons) will have to visit an assigned small holder dairy farm and implement the following tasks:

- Develop a questionnaire and list of observations to make for collection of information on the technical and financial performance of the dairy unit.
- Fill in the benchmark worksheet as an additional check on the technical performance of the dairy unit.
- Through interviewing the farmer and his/ her family, study of farm records, making of observation and the bench mark worksheet collect information to work out the technical and financial performance of the dairy unit.
- Prepare an advice for the farmer and his/ her family to improve technical and financial performance of the dairy unit based on the identified root causes
- Presentation of assessment results and advise to the dairy farmers in the presence of the assigned farmers.

Activities

Below an overview of all activities related to this module are presented:

Day	Activity sequence	Subject/ Activities
Day One	1 <sup>st</sup>	Introduction Module/ participants/ trainer and introduction into farm management
	2 <sup>nd</sup>	Experience sharing among the participants on farm management
	3 <sup>rd</sup>	Dairy farm management functions, Group exercise
	4 <sup>th</sup>	Farm management areas
	5 <sup>th</sup>	Assignment 2-Visit of small holder farm, observation of dairy unit, collection of farm situation data, conducting assessment using problem tree & SWOT analysis tools, preparing farm improvement plan,
Day two	1 <sup>st</sup>	Assignment 2 presentation and reflection
	2 <sup>nd</sup>	Dairy farm recording and analysis
	3 <sup>rd</sup>	Exposure visit and reflection on the visit
	4 <sup>th</sup>	Briefing on assignment 3
Day three	1 <sup>st</sup>	Field work assignment 3, Prepare for presentation
	2 <sup>nd</sup>	Presentation in presence of farmers
	3 <sup>rd</sup>	Brainstorm winding up of farm managment training
	4 <sup>th</sup>	Course Evaluation and closing

Notes:

## B. Dairy Farm Management Lesson Matrix

Lesson Matrix – Day one	
Topic / Serial #	
Practical Lesson	Lesson 1
Date	
Venue	
Duration	1 day/ Day 1 of the module
Type of trainees	Dairy Extension Workers
Number of students	20 - 30
Starting situation	trainees have very little or no experience with Farm Management
<u>Learning Objectives:</u>	The trainees will be able to:
Skills	<ul style="list-style-type: none"> <li>• The participants will be able to analyze dairy farm situation and prepared improvement plan;</li> <li>• The participants will know and exercise the necessary tools &amp; technics on how to monitor dairy farm performance and take corrective action;</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>▪ Explain what "farm management" means with specific focus on dairy farming.</li> <li>▪ Understand and explain dairy farm management functions;</li> <li>▪ Explain which management areas are there on a smallholder dairy farm.</li> <li>▪ Explain how objectives can be formulated for each management area and how these objectives can be monitored.</li> <li>▪ Explain which and KPI's can be calculated from farm records and how they can be verified through farm observations</li> <li>▪ Explain how KPI's can be benchmarked and used for the analysis of the financial and technical performance of small holder dairy farms</li> <li>▪ Explain how improvement plans can be developed based on the above analysis.</li> </ul>
Attitude	Convince farmers that for optimizing their technical and financial performance measuring of farm information and processing this information into KPI's/ management information is essential for monitoring their performance and for making well informed decisions on plans to improve their performance.

Time in minutes	Brief Content	Role trainer /didactical methods	Teaching aids	Role/activities Participants
30	-Opening of the Course, getting acquainted with each other, explanation Module Book and Course Objectives	-Explaining/ guiding/ making trainees feel at ease	-Module Book	-Listening, introduction of themselves, asking questions, answering questions
30	-Sharing experiences with farm management and analysis -Distribution Farm Management Manual	-Asking for experiences to get an idea about student level	-Example Farm -Farm Management Manual	-Sharing experiences -Check contents of Manual
60	Introduction  Dairy farm management functions -planning	-Explaining theory + presenting practical example	- PPT - Manual	-Observing theory -Checking examples -Asking questions
15	<b>Coffee Break</b>			
60	Dairy farm management functions – Implementation, Evaluation & Control	- Explaining theory + presenting practical example	-PPT -Manual	-Study theory -Study examples -Asking questions
30	Group Exercise –Assignment 1	Explaining exercise	Assignment 1	Group formation, guiding,
60	<b>Lunch Break</b>			
45	Farm Management Areas	- Explaining theory + presenting practical example	-PPT -Manual -	-Study theory -Study examples -Asking questions
25	Assignment 2 briefing, Group formation	Explaining, grouping	Assignment 1	Providing examples how to do it
15	<b>Coffee break</b>			
120	Field work –Assignment 2		Assignment 1	

Lesson Matrix-Day Two	
Topic / Serial #	
Practical Lesson	Day 2 Farm Management and Analysis
Date	
Venue	
Duration	1 day/ day 2 of the Course
Type of students	Dairy Extension Workers
Number of Trainees	20-30
Starting situation	Trainees have good understanding of what farm management means, Identify and explain farm management function and management areas. They have gained skills on farm assessment and preparing farm improvement plan.
<u>Outcomes</u>	The student is able to:
Skills	<ul style="list-style-type: none"> <li>▪ Training participants will be acquainted with the different farm recordings and able to record dairy farm aspects in appropriate format</li> <li>▪ Participants able to know conducting different farm analysis based of farm recordings and how to advise farmers on improving farm performance</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>▪ Explain the purpose of farm recording and analysis;</li> <li>▪ Explain the different types of farm recordings;</li> <li>▪ Understand criteria for good farm record keeping</li> <li>▪ Identify and Explain the different farm analysis;</li> <li>▪ Understand how to use/incorporate farm analysis results in the farm day to day decision making</li> </ul>
Attitude	Convince farmers that for optimizing their technical and financial performance recording farm information and processing this information into KPI's/ management information is essential for monitoring their performance and for making well informed decisions on plans to improve their performance.



Time in minutes	Brief Content	Role trainer /didactical methods	Teaching aids	Role/activities Participants
60	Presentation, discussion/ reflection assignment 2/ field work	Facilitating group presentation & reflection	Group ppt. Assignment guide	Encouraging/appreciating trainees Make a conclusion from each group presentation
60	Dairy Farm Recording	- Explaining theory + presenting practical examples/ illustrations	Manual/ppt. Farm Recording tools	-Observing theory -Checking examples -Asking questions
15	<b>coffee break</b>			
120	Dairy Farm recording continued...	- Explaining theory + presenting practical examples/ illustrations	Manual/ppt. Farm Recording tools	-Observing theory -Checking examples -Asking questions
60	<b>Lunch</b>			
90	Dairy farm analysis,	- Explaining theory + presenting practical examples/ illustrations	Manual/ppt. Farm Recording tools	-Observing theory -Checking examples -Asking questions
15	<b>Coffee break</b>			
120	Exposure visit to a nearby commercial dairy farm or a government farm			Prior arrangement of farm to be visited, Facilitating grouping
60	Reflection on exposure visit  Briefing on Assignment 3		Assignment 3	Facilitating participants reflection Briefing, provide examples

Lesson Matrix – Day Three	
Topic / Serial #	
Practical Lesson	Day 3 Farm Management
Date	
Venue	
Duration	1 day/ Day 3 of the Module
Type of Trainees	Dairy Extension Workers
Number of Trainees	20-30
Starting situation	By now Trainees have better understand and skills on the different aspects of dairy farm management
<u>Outcomes</u>	The student is able to:
Skills	<ul style="list-style-type: none"> <li>▪ Calculate relevant KPI's, including financial ones, from farm records and information collected through interviewing the farmer and benchmark them.</li> <li>▪ Practical skills on farm analysis and advising farmer based on the analysis made</li> <li>▪ Able to interact with farmers on assessing farm situation, understanding problems encountered;</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>▪ Learn from field work and farmers experience and challenge;</li> <li>▪ Learn how to put the skills &amp; knowledge they acquired from the training in to practice</li> </ul>
Attitude	Convince farmers on how to optimizing their dairy farming operation through improving their farm management capabilities.

Time in minutes	Brief Content	Role trainer /didactical methods	Teaching aids	Role/activities Participants
300	Field work, Presentation preparation	-Guidance and coaching	-target farms	-Preparing presentation
60	<b>Lunch Break</b>			
120	Presentation field work and discussion	-Assessing performance	-Projector/ white board/ flip overs	-Group presentations
60	<b>Coffee Break</b>			
30	winding up module Evaluation of course	-Explaining evaluation form	-Evaluation form	-Filling evaluation form
30	Closing	-Final Remarks -Awarding certificates	-Certificates	-Listening and receiving their certificate

## C. Dairy Farm Management Assignment

### Assignment – 1 (Class Room Group Exercise)

The training facilitator will group the participants for this exercise. One group shall contain 5-7 participants.

#### Exercise:

Identify KPIs that are relevant to Ethiopian smallholder dairy farmers for the following farm management areas:-

- Feed & Nutrition Management
- Milk production, processing and marketing
- Forage production management
- Young stock Management

Each group will work on a separate management area. Either the participants can choose from the above list or the training facilitator assign the management areas to each group.

#### Required:

- List of KPIs on each farm management areas

### Assignment – 2 (Field work)

The training participants will form a group (5 participants per group) to undertake a smallholder farm situation assessment and preparing a business plan. The training facilitators will select nearby smallholder farmers for the fieldwork.

#### Objective of the assignment:

- The participants will learn how to practically use/apply the different farm situation assessment and planning tools/techniques.

#### Required:

The group members are expected to:

- Collect the required information/data about the farm through interviewing HH members, extension officers, and other relevant people related to the farm; observing the farm and referring recorded data, if any.
- Prepare problem tree and SWOT analysis.
- Prepare a farm plan on behalf of the farm owner that include:- objective, strategy, activity, resource required, and activity implementation schedule.
- Prepare presentation for the plenary session.

### Assignment -3 (Field work)

The participants will form a group of five persons and carry out a farm analysis at a local smallholder dairy farm.

The group members will go to the farm-

- Collect the relevant performance data – minimum six month maximum 1 year data.

- Register in the different dairy farm recording formats;
- Evaluate and analyze the farm performance and develop an advice for the farmer how to improve his/ her technical and financial performance.

On the last day of the Farm management Module training the group will present their findings to the trainer, the other participants and the farmers involved in the assignment. A summary of the advice is handed in as a report (max. 2 pages A4). The report is handed in as hard copy or by e-mail on the evening before your presentation.

The farmer has the following questions:

- How is my farm doing?
  - What is going well?
  - What can be improved?
  - Can I earn a higher income from my dairy enterprise?
- How to improve my results?

**Objective:**

- The training participants will learn how to use the different dairy farm recording and analysis tools & techniques in their day-to-day dairy extension service delivery to small holder farmers.

**Required:**

- Recording the dairy farm performance and other relevant data using the dairy farm recording formats;
- Analysing the data captured by dairy recording formats and preparing an advice to the farmer as an extension specialist.
- Prepare a 1-2 page report on the analysis and farm advice.

**Time available:**

- Day 2 afternoon, explanation assignment, information provided on assigned small holder farms, prepare checklist for information to be collected during visit and what observations to be made.
- Day 3 Morning, visit of assigned small holder farm, interview of farm family, collection of information, calculation of KPI's, analysis of results, making an advice/ action plan for the farmer to improve his/ her technical and financial results, put summary on paper and hand over to the trainer, prepare a presentation using flip chart or power point.
- Day 3 after noon- group presentation, after lunch break (each group member presents a part of the advice/ action plan)

## D. Assessment form written report (Group score)

Group members: .....

Subject / Title: .....

Group Score..... (out of 60, each item can score from 1 to 10 points, 1 = very poor/ 10 = excellent).

	Excellent	Good	Average	Poor	Very poor
<b>1. Introduction</b> <ul style="list-style-type: none"> <li>- Objective of the report was indicated</li> <li>- Method of work is explained</li> <li>- Content of the report is introduced</li> </ul>					
<b>2. Description of the actual situation</b> <ul style="list-style-type: none"> <li>- Description of the farming system</li> <li>- Description of enterprises</li> </ul>					
<b>3. Data collection and analysis of the actual situation</b> <ul style="list-style-type: none"> <li>- Data collection</li> <li>- Analysis of data</li> <li>- Identification &amp; Relative importance of constraints</li> </ul>					
<b>4. Proposal for improvement</b> <ul style="list-style-type: none"> <li>- Technical description of the proposal</li> <li>- Quality partial budget</li> <li>- Economic impact of the proposal on the overall farm Technical Performance/ GM/ NFI</li> <li>- Organisational aspects of the proposal</li> <li>- "Practicality/applicability of proposed action/proposal</li> </ul>					
<b>5. Conclusion</b> <ul style="list-style-type: none"> <li>- Based on the contents of the report</li> <li>- Clear and well formulated</li> </ul>					
<b>6. Quality of the Report</b> <ul style="list-style-type: none"> <li>- Language</li> <li>- Level (for farmer)</li> <li>- Lay out</li> <li>- General impression</li> </ul>					

*Assessment is passed with a score of minimum 35 points*

## Assessment form for observation of student during presentation (Individual score)

<b>Name trainer:</b>	
Enterprise presented:	
Observer:	
Date:	
<b>Behaviour criteria; The participant:</b>	<b>Remarks and score by observer (range from 0 (insufficient) to 5 (very good))</b>
1. Has prepared the correct and required teaching aids	
2. Presentation can be followed by all including farmers	
3. Presentation follows a logical path and is divided in clear steps if required	
4. Links the level of knowledge and skills instructed to the level of the farmers	
5. Can execute the basic skills required for the lesson	
6. Speaks clearly and is pleasant to listen to	
7. Makes contact with the group and keeps this momentum during the lesson( presentation session)	
8. Stimulates interaction with the participants	
9. Provides for feedback during the presentation to check if message comes through	
10. Can describe to which extend outcome was realised	
Further Remarks and final score :	

*Minimum score for passing the assessment will be 30.*





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