

# **WOLKITE UNIVERSITY**

## **COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES**

### **DEPARTMENT OF BIOLOGY**

**A SENIOR PROJECT PROPOSAL ON THE ASSESSMENT OF DAIRY PRODUCTION SYSTEM, COMMON CONSTRAINTS AND THEIR MANAGEMENT PRACTICE IN CHEHA WORDA, GURAGE ZONE, SNNPRS, ETHIOPIA**

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## **LISTS OF ACRONYMS / ABBRIVATIONS/**

CSA--- Central Statistical Authority

CWAO---Cheha Woreda Agricultural office

EDGET---Enhancing Dairy Cattle Sector Growth in Ethiopia

FAO---Food and Agricultural Organization of the United Nations

FAOS -- Food and Agricultural Organization society

ILCA---International Livestock Central for Africa

USDA—United nation Agricultural and Developmental Organization

SNNPR—Southern Nation Nationality of people of Region

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# 1. INTRODUCTION

## 1.1. Background of the Study

Agriculture is the most employment industry in the world; it employed 42% of the world population and more than 50% of the world developing countries population. Livestocks are the sub sector of agriculture and its production is most important components of the economic and social life of the most developing nation of the world.

Africa only produces 8% of the total world production. In Sub-Saharan Africa, Ethiopia has the largest livestock's with about 50 million or 20%, closely followed by Sudan (41 million) and Tanzania (19 million) (FAO, 2010).

Ethiopia has one of the largest livestock populations in Africa. Estimates for farmer holding in rural areas indicate that the country has about 56.71 million of cattle, 29.33 million of sheep, 29.11 million of goats, 1.16 million of camels, 44.89 million of poultry, 2.03 million of horses, 0.4 million of mules and 7.43 million of donkeys (CSA, 2014/15). Livestock production plays an important role in Ethiopia economy. Livestock production is a major component of agricultural economy of developing countries and goes well beyond direct food production. Sale of livestock and their products provide direct cash income for farmers (Anon, 2001). Livestock are living banks for many farmers and a critical role in the agriculture intensification process through provision of drought power, food, cash, and transportation fuel and manure for fertilizer; especially in pastoral areas, social prestige (Brought, 2003). The overall contribution of livestock especially their multipurpose contribution to food and agricultural production in developing countries is very crucial (Anon, 2001).

Dairy cattle have important economic value in Ethiopia and dairy cattle have the potential in dairy cattle production for various reasons. This includes large population of milk cows, conducive and disease free agro-economic climate condition. Existence of large human populations with long traditional consumption of milk and milk products and hence, potentially large domestic markets (Belete *et al.*, 2010). Dairy products, milk and milk products play a very important role in feeding of the rural and urban population of Ethiopia and have high nutritional value. It is cash cropping the milk shade areas that enables families to buy other food stuffs (Sintayehu, 2003).

Although, Ethiopia holds large population of dairy cattle, the total products remain low in the world; even by African standards. This is due to high perishable nature of the milk and mishandling the products (Getachew, 2003). Dairy productions, their products are fundamental to the country's economy but there is no significant improvement on the quality of dairy products from year to year (Azage *et al.*, 2003).

Even if, dairy products are essential for human beings, the handling systems of the products are influenced by several factors (Sintayehu *et al.*, 2003). As indicated by (Belete *et al.*, 2010), dairy products are affected by the socio-economic condition, limited climatic condition, handling systems of the cattle and procedures in different areas. This all cases the main minimal production problems of dairy cattle production.

According to Pay (2000), the problems like infertility and sub optimal fertility may include the failure to conceive, delayed conception, abortion, still birth and reduced litter size in the female and poor libido and low viability aimed of sperm in the male. The low productivity is attributed to the low genetic potential of indigenous cattle, poor nutrition and reproductive performance, inadequate management, high disease incidence and parasite burden. Therefore, this study will aimed to access the dairy production system, common constraint, production problems on dairy cattle and their management practice.

## **1.2. Statement of the Problem**

The dairy cattle production system is a great potential development and important issue in Cheha Woreda, SNNPR Gurage zone, where dairy cow and their products are the major source of income in cash and food, but there are challenges of production system, common constraints and management practices. The health problems make a bottle neck in its productivity. By using preliminary survey before our study we will come to know that there are many challenges and factors that induce the health and productivity problems of dairy cattle in this worda of selected kebele, including poor management, shortage of water, shortage of food, and diseases attack. Therefore, this study will try to answer the following research questions:

- ✓ What is the status of dairy production system in the dairy farming area?
- ✓ What are the major or common constraints of dairy cattle in the study area?
- ✓ What are the factors that lead or contribute to the common constraints of dairy cattle?
- ✓ What is the effect of health related problem on dairy cattle productivity?

- ✓ How the environment could be one of the major factors for the dairy cattle constraint?
- ✓ What knowledge or skills do have the dairy cattle owner, on the management practice and other related case?

### **1.3. Significance of the Study**

The findings of this study will help the dairy cattle owners to have a better understanding and awareness on dairy production system, the factors that affect the health and productivity of dairy cattle, and the ways of management practice. The findings of the current study could also give the possible ways to minimize the common constraints that affects the health of cattle and productivity of dairy cattle. The study result will also serve as reference data for those who want to conduct further studies regarding dairy cattle production, challenges and status of milk production. Therefore, the finding of this study will:

- ❖ Provide enough information about the common constraints of dairy production system of the present study area.
- ❖ Give answers for the management practices of dairy production system of the study area.
- ❖ Be the base line or guide line data for further related studies.
- ❖ Create awareness about for dairy cattle owners.

### **1.4. Objectives of the Study**

#### **1.4.1. General Objective**

- To assess current dairy production systems, common constraints of dairy cattle and their management practices in, Cheha Woreda Gurage zone.

#### **1.4.2. Specific Objectives**

- To assess the current dairy production system in the study area.
- To identify main constraints of dairy cattle production system in the study area.
- To recognize the type of dairy production system in the study area.
- To admit dairy cattle management practices in the study area.
- To forward recommendation based of the finding of this research work for dairy cattle farmers and other stake holders.

## **2. LITERATURE REVIEW**

### **2.1. Dairy Production System in Ethiopia**

Dairy production is an important component of livestock production in Ethiopia. It is an important source of food, income and creates job opportunity for many people in urban and rural settings. However, despite its huge number, the performance of subsector in general is low compared to its potential, and the direct contribution it makes to the national economy is limited (Sintayehu *et al.*, 2003). In Ethiopia the national average milk yield per cow per day is 1.35 liters for indigenous cows and the per capita/ milk consumption in the country is about 19.24 kg/year, which is much lower than African and world per capita average of 27 kg/year and 100 kg/year, respectively (CSA, 2014/2015). CSA (2014/15), reported that the indigenous cattle breeds accounted for 99.1%, while the hybrids and pure exotic breeds counted for about 0.72% and 0.09%, respectively. Despite its large livestock resource base and an ecological setting suitable for dairy production, it is not yet self sufficient in milk production.

#### **2.1.1. Traditional production systems**

These systems include the pastoral, agro-pastoral and subsistence mixed crop-livestock production systems.

#### **2.1.2. Improved production systems**

This category is characterized by high inputs. These are market-oriented production systems in which farmers adopted improved technology to optimize productivity.

### **2.2. Types of dairy production system in Ethiopia**

As indicated by Azage *et al.* (2013) there are three different types of dairy production system in Ethiopia. Those are urban, semi urban and rural system. Each of those systems is defined by its location agro-ecology, their production objective, resource and resource use, scale of production, and management, market orientation, and access to input and service.

### **2.2.1. Urban system.**

According to the report of Azage *et al.* (2013), urban dairy production system is located in different parts of the country such as Hawassa, Shasemane, Yirgalem, and Dilla is mainly based on cattle, both improved dairy cattle genotypes [crossbreeds or high-grade] and indigenous cattle. Urban dairy farming is a system involving highly specialized, state or businessmen owned farms, which are mainly concentrated in major cities of the country. Moreover, price is high even when quality is low.

### **2.2.2. Peri urban dairy system**

Peri urban dairy system of Shashemene Hawassa, Yirgalem and Dilla are located in rural area at the periphery of those towns which have relatively better accesses to urban centers in which dairy products are highly demanded (Azage *et al.* (2013). Peri-urban milk production is developed in areas where the population density is high and agricultural land is shrinking due to urbanization around big cities like Addis Ababa and other regional towns. It possesses animal types ranging from 50% crosses to high grade Friesian in small to large sized farms, and contributed only 2% of the total milk production of in Ethiopia.

### **2.2.3. Rural dairy system**

Rural dairy system of Fogera and Bure are located in rural mid altitude to highland agro-ecological set-up, which has limited accesses to urban centers where fluid milk is demanded. Rural dairy system is part of the subsistence farming system that contribute up to 98% of the total milk production of in Ethiopia, and includes pastoralists, agro-pastoralists, and mixed crop-livestock producers (Kibirige *et al.*, 2015).

## **2.3. Socio-economic Importance of Dairy Cattle**

Dairy cattle are a business enterprise established for the harvesting animal milk for human consumption. Dairy cattle can be a place that process distributed and sells dairy products (butter, cheese) (Sintayehu *et al.*, 2003). The function of dairy cattle and particularly chose dairy cattle can be categorized as output and input function (Cook, 2008). Output function: food product (hide, horn, hooves, etc.). Input function (manure and work) both output and input function are the byproduct of livestock sector which have great economic importance for the livestock farmers and the world country as a whole (Cechinato *et al.*, 2009).

### **2.3.1. Milk production**

Indigenous breed of cows are generally considered low milk producers. For North Gondar indigenous cattle, the overall average estimate lactation yield was  $540 \pm 21.05$  liters per head, which is very low due to poor genetic makeup, shortage of feed and poor management conditions (Azage et al., 2013).

The overall lactation length of local cows in the Gambella region is estimated to be 7 months with average daily milk of 2.07 liters (CSA, 2008). The average milk yield of local cows found in Somali region is less than two liters per day which could reach up to 488 liters over a 249 days lactation period in all pastoral areas elsewhere (IPS, 2000).

### **2.3.2. Traditional milk handling and processing practices in Ethiopia**

According to report by Tsegaye (2016) milking and milk handling practice of the Bona Zuria district practice suckling before milk and majority of them exercise suckling before and after milking in rural production systems. The majority of them cleans their milk utensils once per a day, and followed by twice and three time per a day. The shelf life of milk and milk products increased by smoking of container (67.3%), boiling after collection (8%), and salting ([24.7%) in rural production system while the shelf life of milk and milk product of urban and semi urban production system increased by smoking of container (77.19%), boiling after collection (5.4%) and salting (17.5%). As stated by Azage (2013) hygienic milk production is important and should take into account the sanitation of barn personnel involved in milking and the utensils used to collect and store milk. Sanitation of milking and milk storage utensils varied between rural and urban people.

### **2.3.3. Milk consumption**

According to report by Tsegaye (2016) milk producer of Bona district not only consume milk products, but also sell the milk and butter to consumers, retailers, and traders. Whole milk, sour milk, butter milk, and cheese were among the common milk products of produced and consumed in Bona Zuria district, of Sidamo regional state.

Milk and milk products form part of the diet of many Ethiopians and they consume dairy products either as fresh milk or in fermented or soured form.

## **2.4. Common Constraints of Dairy Cattle Productivity in Ethiopia**

Livestock production constitutes of the principal means of achieving improved living (Anon, 2009). However, the productivity is low due to various constraints; disease, nutrition, poor management, practice, environmental condition, and poor productivity performance of the livestock of local or indigenous breed. Not only these factors, problems disease like bovine tuberculosis, brucellosis, anthrax and others are the major health problems (ILCA, 2005). According to Fish Wick (2006), trouble digestive disease, haven disease or brown, hypomagnesaemia and others are the economic disease for the measure of low productivity in dairy cattle.

### **2.4.1. Dairy Cattle Reproductive Problem**

A dairy reproductive problems result in considerable in the loose of economic, loss of production and cause of poor productivity performance, come from the management system, housing system, feeding system, water and other management form of dairy cattle production (Pay, 2000). Dairy cattle in Ethiopia are manifested under different production system, different management system, different environmental condition under which dairy cattle are maintained. These conditions greatly affect the health and productivity of dairy cattle (ILCA, 2005).

According to Mukasso (2009), the reproductive performance of dairy may influenced by certain factors like environment, genetics, disease and management factors. Also this reproductive performance in dairy cattle affected by fertility of the animals, i.e. the level of the fertility of dairy can be determined by the parameters of the pregnancy rate offer first insemination and average between parturition, the numbers of insemination and conception.

### **2.4.2. Nutritional Problems in Dairy Cattle**

According to Hocker (2000) reported the main issue is mastitis from fiscal contamination of teat (udder) ends, lameness, from hoof damage luminal acidosis from poorly formulated and

mixed diet of competition for through space. This will reduce milk production and animals' welfare (Hocker, 2000).

### **2.4.3. Low breeding**

Low breeding efficiency has long been recognized as one of the major problems affecting the efficiency of milk production (Cechinato *et al.*, 2009). Delayed first service and low conception rates are also the major problems.

### **2.4.4. Management Problems in Dairy Cattle**

Herd management practices in cow handling nutrition, milk procedures, sanitation and housing play major roles in predisposing the individual animals as well as herds to diseases (May, 2002). Diseases which are transmissible from cattle to human spread through vectors or wild animals or epizootic disease because of management problem (Getachew, 2003). Dairy farm management should be sophisticated, particularly in the tropics with added environmental stresses. Creating a continuous disease threat which small holder must integrate into their management system (Fish *et al.*, 2006). Crowded born ,high level of concentrate feed ,lack of dairy personal training and lack of experience to identify early stages of disease and apply timely and appropriate treatment are factors that contribute to the loss of animals, (May, 2002).

### **2.4.5. Major Diseases and Health Problems in Dairy Cattle**

#### **2.4.5.1. Dystocia in Dairy Cattle**

Dystocia more commonly known as difficult calving a prolonged or difficult parturition varies from the need for increase procedure attention to the loss of the cow and calf (Corner *et al.*, 2000). Difficult birth is a leading cause of calf death at or shortly after birth and leads to uterine infections and more related placentas; several studies have implicated dystocia as milk yield and reproductive performance (Fouriccho *et al.*, 2000). Dystocia has a direct negative impact on calves (e.g. prolonged hypoxia, significant acidosis, vigor, increased still born calves etc. (Lombard *et al.*, 2007). The main causes of dystocia; fetal maternal size miss-match (e.g. bull calves), fetal mal presentation and dam related cause (e.g. uterine torsion) (Zworf, 1999). Severe dystocia is associated with increased risk of still births, calves morbidity leg, respiratory diseases and within 30 days post calving. Postpartum cows subjected to severe dystocia increased risk of uterine diseases (Colostate, 2010). Dystocia is an economically important trait in the dairy industry as it is associated with approximately

50% of calf mortality cases at birth (Mee *et al.*, 2008; Purified *et al.*, 2012) but can also have a profound influence on cow performance postpartum.

#### **2.4.5.2. Mastitis in Dairy Cattle**

Mastitis is inflammation of the cow's mammary gland usually caused by bacteria entering the teat canal and moving to the udder (Loven *et al.*, 2015), Mastitis in dairy cattle can result in potential losses in milk production, milk income and milk quality. Mastitis in dairy cattle is the persistent inflammatory reaction of udder tissue. Mastitis is a potential fatal mammary gland infection is the most common disease in dairy cattle (Retrieve *et al.*, 2010).

It occurs when blood cells (Leukocytes) are released into the mammary gland, in response to bacteria invading the teat canal. Milk secreting tissue and various ducts throughout the mammary gland are damaged due to toxins released by bacteria. Mastitis can also occur as result of chemical, mechanical or thermal injury (Coline *et al.*, 2010).

Mastitis transmitted through, contagious and environmental mastitis. Contagious mastitis possess from cow to cow through unsanitary milk protocols. The environmental mastitis variety is picked from the cow's area such as soiled bedding or farm ponds (Fox Hormen, 2002).

Mastitis can be identified by abnormalities in the udder such as swelling, heat, redness, hardness, or pain if it is clinical. Other indications of mastitis may be abnormalities in milk such as a watery appearance, flakes or clots (Loven *et al.*, 2015). When infected with sub clinical mastitis a cow does not show any visible sign of infection (Retrieve, 2010). Mastitis is ranked on severity as a acute, chronic or sub clinical. A acute is sudden onset with severe symptom, chronic is long term, possibly resuming infection. Sub clinical is not observed but discovered through routine testing of the milk (Fox Hormen, 2002). Generally, mastitis disease causes the largest economic lost to dairy farms than any other disease.

#### **2.4.5.3. Abortion in Dairy Cattle**

According to EDGET (2017) abortion is expulsion from the uterus of a living fetus before it reaches a viable age or expulsion of a dead fetus of recognizable size at any stage of the gestation period. Abortion in dairy cattle defined as a loss of fetus, between the age of 42 day and approximately 260 days. Pregnancies loss before days are usually referred to as early embryonic deaths, where as a calf that born dead between 260 days and full term is defined a still birth. A low rate of abortions is usually observed on farms and 3 to 5 abortions per 100

pregnancies per year is often considered “normal”. However, the loss of any pregnancy can represent a significant loss of abortions and investigate the cause of abortions that may occur (Risco *et al.*, 2001).

Common cause of abortion: while infections agents perhaps the most frequently thought of cause of bovine abortion. There are other factors which may cause a proportion of pregnancies to terminate with an abortion. Genetic abnormalities on the fetus that result in abortion are not very frequently diagnosed, and these usually occur as an individual cow problem rather than as a herd outbreak. Heat stress: can affect reproductive performance in a dairy herd, although it will generally cause conception problems rather than abortion. Toxic agents may also cause abortions or early embryonic deaths. Cattle are susceptible to fertilizer nitrates found in plants under certain conditions leg drought stress. If nitrate is greater than 55% in forage, abortions may occur, especially in late gestation (Kinsel, 1999).

#### **2.4.5.4. Effect of Dairy Cattle Health Problem on production of milk**

Dairy cattle disease and health problems are component of economic function of dairy cattle and loss of productivity (McInernery, 2007). Disease causes loss of products and production, cause morality, loss of fertility, even loss of dairy animals and etc. high incidence of disease may cause great loss of productivity next of feed (Ensinger, 2002).

In developing countries, especially Ethiopia, the prospects of dairy cattle production largely depend on the extent limitation of geographically, cultural and socio-economic which have great impact on the prevalence of economic disease concerned with the production of dairy cattle (Mukasso, 2001).

## **2.5. Management practices for challenges on dairy cattle and milk production**

Increasing milk yield depends on a number of management practices. Bebe *et al.* (2003) argued that increasing lactation yield of a dairy cow has been achieved more by nutrition than by genetics. Lues *et al.* (2012) argues that the quality and quantity of milk received in smallholder systems is likely to be influenced by the milking behaviour of the operator (milking duration and techniques). The difference between commercial and smallholder farms is mainly determined by herd size, breeds raised and management level (Borner *et al.*, 2012).

Smallholder farmers keep few animals that are mostly crossbreeds using a low input production system (Nicholson *et al.*, 2004). The support from the institutions includes access to initial stock and improved dairy technologies.

### **2.5.1 Feeding dairy cows**

Generate sufficient initial capital on their own to profitably engage in dairy farming (Tavirimirwa *et al.*, 2013).

Smallholder dairy farmers use knowledge of animal behavior to improve cow well-being and yield (Devereux, 2014). For instance, feeding and watering systems must be placed where young or inexperienced animals can find them. Communal cattle are rarely supplemented with commercial feeds or improved legume fodder resulting in low intake of poor quality feed, which often limits livestock productivity (Onono *et al.*, 2013). Since feeding is restricted, cattle have little choice of feed, resulting in poor body condition and low weight gains and a higher predisposition of the animals to endoparasites during the dry season (Katsande *et al.*, 201). Forage requirements can be met by the utilization of pastures, green chops, silage, hay or combination of any of those.

Consumption increases up to 14.5 kg dry matter when cows graze day and night (Miller, 2012). The common practice of feeding and milking cows in groups thus has a sound psychological basis (Stone *et al.*, 2015).

Tegegne *et al.* (2013) reported that feed marketing is not well organized and informal marketing is the dominant system in Ethiopia.

### **2.5.2 Housing management**

Espinoza-Ortega *et al.* (2007) articulated that the reasons for proper housing for a dairy cow is to protect animals from sun burn, rain, hot and cold winds of the inclement weather; to provide clean and comfortable shelter and to protect animals from wild animals and theft. Herrero *et al.* (2009) indicated that advantages of adequate housing as increased production of milk; better utilization of labor; production of higher quality milk and milk products; better health of animals; decrease in mortality rate of calves; proper disease control; better care and supervision of animals.

### **2.5.3 Health management practices**

Miller (2012) reported malnutrition and poor animal husbandry as the major predisposing factors to poor animal health among smallholder farms. The combination of health and

nutrition challenge in dairy production implies further suppression of animal productivity in terms of milk yield and fertility.

#### **2.5.4. Financial management**

Financial management is considered to deal mainly with how farmers acquire finances and how those finances are managed. A number of studies has emphasized the importance of financial management in smallholder farming and determining the relationships between profitability and leverage, and also the importance of book keeping practices (Getachew 2003,). The level of education plays a major role in determining the finances in smallholder dairy enterprise.

### **3. MATERIALS AND METHODS**

#### **3.1. Description of the Study Area**

The current study will be conducted in Cheha district of Gurage Zone, SNNPR, Ethiopia. Cheha district is located at 8° 10'N latitude and 38° 50'E longitude at an altitude ranges between 1500 -2300 meters above sea level (CSA, 2007). The Woreda capital town is Endibir, which is located about 180km away from Addis Ababa, the capital city of the country and 30km away from the Wolkite, the capital town of Gurage zone.

According to the report of Central Statistical Authority (CSA) (2007), Cheha woreda has a total population of 115,951, of whom 56,851 were men & 59,100 are women; & 8,992 (7.76%) of its population are urban dwellers. This District consists of 38 kebeles of which each kebeles have their own dairy cattle farming system. The most well known and most productive dairy farming sectors are found 10 kebeles. These kebeles are; Yeferezeze, Emideber 01, Emideber 02, Sesana and Mate (around Atta), Afitteri, Meganase, Yedabe, Girari, Enidebari and Yesesiya kebele. From total inhabitants of the woreda, about 42.98% were reported as Muslim, while 36.31% were Orthodox, 12.87% were Protestants and 7.73% were Catholics (SNNPR Bureau of Finance & Economic Development website (accessed 28 Feb, 2020).

##### **3.1.1. Agro-ecology and land uses of the study areas**

The area has bimodal-type of rain fall pattern. The main rainy season occurs between June & September, while short rainy season that lasts from March to April. It received around 1300mm rain fall annually in a bimodal rain fall distribution pattern. It receives an average annual rainfall of 750mm. Rainy season is the main season for crop production. The minimum and maximum mean annual temperature of the area was 18<sup>0</sup>C-20<sup>0</sup>C, respectively (EMR, 2004). The agro-ecology of the woreda is categorized as Midland (locally called Woina-dega) (USAID, 2005). The Woreda has a potential both for animal husbandry and crop farming. The district is known for its enset-based farming system in which both perennial and annual crops are grown. In addition to enset, most of the other crops grown are perennial, such as chat (*Chata edulis*), coffee (*Coffee arabica*), mango (*Mandifera indica*), avocado (*Persea americana*), lemon (*Citrus orientifolia*), and orange (*Citrus sinensis*). The annual crops are grown in the Woreda during 2 rainy seasons: from June to September and the short rainy season that lasts from March to April. During this season, farmers grow barley, wheat, teff, and potatoes. During the short rainy season, they practice intercropping of

maize, tomato, cabbage, and green peppers with immature enset and coffee. Planting eucalyptus (*Eucalyptus camaldulensis* and *E. globulus*) trees for cash income is also becoming common practice in the area (Holeta Agricultural Research Centre, 2011). The soils in the woreda are of different types, the most of which are clay (68%), silt 30%, and sand 2% (Cheha District Agricultural Office /CWAO/, 1998). The soil of flat land is darkish in color with clay loam texture; part of the area with steep slope has lack of organic matter, because the decomposed litter fall is washed out easily when heavy rain comes during summary time (CWAO, 1998).

Land use; Most of the land in the area is privately owned and individual holding is estimated to be about 2ha per household. Even though, most of the land is devoted for cultivation or crop production, there are five common categories in the study area (Fikadu, 2006). There are various land patterns; arable land, grazing land, natural forest, plantation forest, and human forest and forage lands.

### **3.2. Study Design and Study Period**

A cross-sectional survey will be employed to determine the current status of dairy production, common constraints and dairy cattle management practices in study area from February, 2020 to June 2020.

### **3.3. Study Population**

The study population of this study are whole population of the study area who participate on rural urban, and semi urban dairy production system.

### **3.4. Sampling Techniques and Sample Size Determination**

From a total of 13 dairy farming sectors located in the Cheha District (of which 5 are rural dairy farming sector, 7 urban farming sector and 1 semi-urban farming sector), of which seven dairy farming sectors (3 urban dairy farming sectors, 1 Semi-urban dairy farming sector and 3 rural dairy farming sector) will be selected using purposive sampling technique based on the accessibility and potential for dairy production. Multistage sampling technique will be used for this study to determine sample size. First dairy farming sectors will be clustered in to urban, semi-urban and rural dairy farming sectors. Then, the owner and individual household actively involving in dairy farming sector will be identified and listed. Finally, a total of 70 individual those actively involved in dairy farming including the workers of dairy farming from each sectors and householders(workers those who are involved in side dairy farming sectors), those have different roles in dairy production system will included, 30 from urban (10 household per each urban sector), 10 per each semi-urban (10 household from urban sector) and 30 from rural dairy farming sectors (10 household per each rural sector) will randomly selected for this study. Hence, the sample size will have 70 individual households which used as respondents.

### **3.6. Data Sources and Methods of Data Collection**

The data will be collected both from primary and secondary data sources. The primary data will be obtained using semi-structured questionnaires, interview, field observation and group discussion. To collect data on the dairy production system, challenges of dairy cattle and their management practices, from dairy cattle owners (farmers). The questionnaires will include the questions that focus on socio-economic characteristics of respondents, status of dairy production, types of dairy production system, common problems of dairy cattle and dairy production and their management practices. In addition, the questionnaire will also include the data that focus on dairy cattle feeding, housing and watering practices. While, secondary data sources obtained from the zone and Cheha woreda agricultural offices, Journal articles and books. The questionnaire will be originally prepared in English language and then translated into Guragigna language (which is a mother tongue) to enable the respondents to understand the questions clearly.

### **3.7. Method of Data Analysis**

The collected data will be entered into Microsoft Excel for the purposes of data management. The organized data will be analyzed using simple descriptive statistics such as mean, percentage and frequency. Then, the result of this study will be presented with tables and figures.

## 4. WORK PLAN AND BUDGET BREAKDOWN

### 4.1. Time schedule

The time schedule is the expected to accomplish this research and time table will expect to carry out activities as mentioned in the below table.

**Table 1.** Time schedule and activities

S. No	Activities	2019				2020			
		Nov	Dec	Jan	Feb	Mar	April	May	June
1	Title selection	✓							
2	Search for relevant literature	✓	✓	✓					
3	Developing draft proposal			✓	✓				
4	Submission of final proposal				✓				
5	Data collection					✓	✓		
6	Data processing & analyzing							✓	
7	Submission of final paper							✓	✓
8	Presentation of final paper								✓

### 4.2 Budget Break Down

**Table 2.** Budget break down

No.	Items	Quantity	Unit Prices	Total birr
1	Pen	4	10	40
2	Paper	1 Packet	500	250
3	Binder	1	50	50
4	Printing cost	100 pages	15	75
5	Internet cost	100 MB	0.5	50
6	Transport	100km	2	200
7	Flash	1	400	250
8	Photo copy	60	0.5	25
9	<b>Total costs</b>			<b>940.00</b>

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## **APPENDICEX**

**Wolkite University**

**College of Natural and Computational Sciences**

**Department Biology**

### **Introduction**

Dear respondent, the purpose of this questionnaire/interview/, is to conducted research work entitled with “**Assessment on the Current status of Dairy Production System, Major Challenges and Management Practices in Cheha Woreda, Gurage zone, Southern Ethiopia**”. Therefore, your genuine responses are extremely valuable for the success of this study, and will be kept in complete confidentiality and anonymity.

### **Questionnaires:**

#### **I. Personal information of Respondents.**

1. Name \_\_\_\_\_ Age \_\_\_\_\_, Gender: A. Male B. Female
2. Zone \_\_\_\_\_; Woreda \_\_\_\_\_, Kebele \_\_\_\_\_
3. Marital status: A. Single B. Married C. Divorced
4. Educational level:  
A. Illiterate B. Primary school C. Secondary school D. Higher education
5. Religion: A. Christian B. Muslim C. Catholic
6. Family size: Male \_\_\_\_\_, Female \_\_\_\_\_, Total \_\_\_\_\_
7. Job Category: A. Farmer B. Merchant C. Governmental D. Other

#### **II. Dairy production system.**

1. Which type of dairy production system do you have?  
A. modern B. traditional C. both
2. Which form of dairy production system you have followed?  
A. urban B. semi-urban C. rural

#### **III. Milking equipment, milk processing, milking area, milk handling**

3. How much litter of milk do you get per a day?
4. Which type of milking equipment do you experienced in every day of milking?

A, modern B, Traditional C, BOTH

5. What kind of skill do you have on handling of your milk?

6. For what purpose do you used your milk product?

A. For home consumption B. For marketing (income purpose) C. other

#### **IV. Land holding patterns by dairy farmers**

7. How much grazing land do you have for your dairy cattle [in hectare]?

8. Do you have fence off grazing land for your dairy cattle?

#### **V. Dairy Herd Composition and breeding system**

9. Fill the following blank spaces given to know your dairy herd composition and number.

Dairy cattle	Number	Type of breed (Local breed	cross breed)
A. Lactating dairy cattle	-----	-----	-----
B. Dry dairy Cow	-----	-----	-----
C. Heifer	-----	-----	-----
D. Female calves	-----	-----	-----
E. Male calves	-----	-----	-----
Total	-----	-----	-----

10. What kind of breeding system of your cattle?

A. Uncontrolled [natural] B. Artificial insemination

#### **VI. Feeding, housing and management practices of dairy cattle**

11. How do you feed your dairy cattle in winter when the grass is dry [the scarcity of feeding resource exist] in field?

A, feed them the same way as in summer B, by buying the commercial feed as supplements

C, giving for them crop residues

12. What do you feed your dairy cattle always? A. Cereal straws B. Natural pastures C. Both

13. List concentrate of feeds that you give for your dairy cattle? 1, -----, 2---  
-----, 3-----

14. Do you have houses for your dairy cattle? A. Yes B. No

15. If your answer is 'yes' for question '14', which type of houses you use?

A. Simple shed B. Communal house C. Fence

16. How do you water your dairy cattle?

A. By taking them to river B. Water is fetched from well and provided to them

18. List any other factor that affects health of your dairy cattle? 1.-----2. -----  
-----3. -----4. -----

19. Which treatment methods do you use when your cattle are sick?

A. Modern                      B. Traditional                      C. Both

**VII. Effect of health problems on the productivity of dairy cattle**

20. What are the common constraints of dairy cattle because of mismanagement practices?

- 1.....
- 2.....
- 3.....
- 4 .....
- 5.....
- 6.....

**VIII. Common problems of dairy cattle and dairy production system in the study area**

21. Which type of challenges can face{exist} or occurs on your dairy cattle

A, housing B, watering C, Feeding D, disease

22. Have you ever experienced any sickness on your dairy cattle?

If yes; A, Internal B, External C, both

**Thanks for your collaboration!!!**