

# Dairy Production and Marketing Systems in Kaffa and Sheka Zones, Southern Ethiopia

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## Abstract

The study was conducted in four districts of Kaffa and Sheka zones to assess dairy production, processing and marketing system. A total of 140 were interviewed using semi-structured questionnaire and the collected data was analyzed by using SPSS. Accordingly, the majority (42.7%) of the households use animal feeds from their own crop farm majority. About 88.8% of households milked their cows twice a day while the rest milk their cows once a day with 1.74 liters of milk per cow per day on average. In milk processing about 47.9% of dairy producers used traditional churning material called clay pot while the rest used wooden 'Kell', both wooden Kell and clay pot and plastic material. The major constraints for dairy production and marketing system in the study area are lack of improved forage seed and improved dairy breed, livestock diseases, lack of awareness on dairy husbandry practices, limited infrastructure, lack of dairy producing and marketing cooperative. There no formal channels for milk marketing in the study area as a result dairy cattle owners practice informal milk marketing system. The mean prices of milk, cheese (ayib) and butter in the study area were 14.04±.36 per liter; 33.3±.91 per kg and 92.84±2.07 per kg, respectively.

**Keywords:**-Dairy, production, marketing system and postharvest handling

## 1. INTRODUCTION

Ethiopia was home for livestock inventories in Africa with an estimated 55.03 million cattle, 27.35 million sheep, 28.16 million goats, 1.96 million horses, 6.95 million donkeys, 0.36 million mules, and about 1.1 million camels and 51.35 million poultry of livestock population (CSA, 2014). Of the total population, female cattle constitute about 55.38% of the national herd with 17,407,122, 12.13% dairy cows and 19.5% milking cows. Eighty-three percent of all milk produced in Ethiopia comes from cattle with the remainder coming from goats and camels (MoARD, 2007). Dairy sector is a major contributor to economic development especially among the developing countries. As an engine of growth, it provides increased income, employment, food and foreign exchange earnings as well as better nutrition (Yilma *et al.*, 2011). As income increases with economic development, the share of animal products in total food budget increases faster than that of cereals. This occurs because of the relatively high-income elasticity of demand for animal products (Ehui, 2008). According to CSA (2014) estimates 2.9 billion liters of cow milk produced by sedentary populations annually while camel milk is estimated at 230.51 million liters annually. The average lactation period per cow during the reference period at country level is estimated to be about six months and the average milk yield per cow per day is about 1.37 liters.

South Nations, Nationalities and Peoples Region is the third highest potential region of the country in livestock production having 11.04 million cattle population next to Oromia and Amhara which owns about 22.50 million and 14.22 million cattle population respectively (CSA, 2014). With average productivity of 1.65 liter per day per cow, the total annual milk yield in SNNPRS is 667, 562 tons (CSA, 2010), from which 88.6% is consumed at home, 2.29% is sold, 0.36 is paid in kind for wage and 8.73% is processed into other dairy derivatives (CSA, 2010). According to SNNPRS's BoA (2014), the total number of dairy cow is 4, 943, 854, from which 933,225 tons of milk is produced per annum. However, the productivity of the livestock resources and the benefits obtained from the sector does not commensurate with the high livestock population (Abebe *et al.*, 2014).

Unlike other part of Ethiopia, Kaffa and Sheka zones are well known in livestock population, well suited agro-ecology and vegetation cover for many years it is known that there is little information in dairy production system, processing and marketing. Identification of prevailing problems and understanding of the existing dairy production and marketing system in the area is paramount importance to make future improvement interventions. The objectives of the current study were therefore to assess dairy production and marketing systems and to identify constraints and opportunities of dairy production and marketing system in Kaffa and Sheka zones.

## 2. METHODOLOGY

The study was carried out in Kaffa and Sheka zones of Southern Nation Nationality Peoples Regional State of Ethiopia. Multi-stage sampling procedure was employed to select respondents for interview. In the first stage, four districts namely Gimbo and Chena from Kaffa; Masha and Andracha districts from Sheka were selected purposively selected based on their based on cattle population and access to infrastructure (road). In the second stage, two kebles were selected randomly from each district. Individual households owning dairy cows of any breed and size were identified and listed in selected kebles in the third stage. Finally, a total of 140 randomly

selected dairy producers were interviewed. First the rapid rural appraisal techniques and secondly, semi-structured interviews were conducted to collect data on dairy production system, processing and marketing. The collected data through semi-structured questionnaire survey was analyzed by using SPSS statistical software version of 16. Descriptive statistics were used to analysis the survey data collected from smallholder dairy producers through semi- structured questionnaire survey in the study areas.

### 3. RESULTS AND DISCUSSION

#### 3.1. Household characteristics and socio-economic profile

The table 1 below shows that out of the total interviewed respondents (N = 140), 95% were male and the rest (5%) were female household members of different age and educational status. Most (97.2%) of the respondents were married, while 0.7% and 2.1% were single and divorced respectively. About 39.3% of the respondents ranged in age between 31–40 years and 41–50 years (29.3%). Regarding the religion of the respondents, 65.7% were orthodox followers, 30.1% were protestant, 3.5% were Muslim and 0.7% was catholic followers. With respect to educational status of the household head, the majority of dairy producers were literate. From the interviewed respondents, about 44.8% and 36.4% have completed grades 1–6, and grades 7–12 respectively, while 16.8% were illiterate.

**Table 1:** socio-economic profile of respondents

Household characteristics	Number of respondents(n)	Percent(N=140)
<b>Sex</b>		
Male	133	95
Female	7	5
<b>Age</b>		
21-30	23	16.4
31-40	55	39.3
41-50	41	29.3
>50	21	15
<b>Marital status</b>		
single	1	0.7
married	136	97.2
divorced	3	2.1
<b>Religion</b>		
Orthodox	94	65.7
Protestant	43	30.1
Muslim	5	3.5
Catholic	1	0.7
<b>Educational status</b>		
Illiterate	24	16.8
1-6	64	44.8
Secondary and above(7-12)	52	36.4

#### 3.2. Production system

Production system identified in the study areas were mixed crop- livestock production system. Mixed crop-livestock production system is a system of which outputs or products and/or by-products of crop and livestock are the resource input for one another. In the mixed crop-livestock production system, milk produced is retained for home consumption and seldom for sale. Cereal crops predominantly produced in the study areas are maize, barley, wheat, millet, bean, pea, teff, sorghum, wheat and barley. Crop farming in the study area is mainly practiced using oxen draught power, seldom with hand tools and oxen are given due attention than other cattle types. Because of large part of land is covered by natural forest in the study areas, it is common to see highly diversified cropping practices with *enset*, coffee, fruits and vegetables which are common crops grown in the study area.

##### 3.2.1 Purpose of dairy production

In the study areas, cattle of dual purpose predominated by local type (zebu), were mainly kept to produce milk for household consumption and male calves were grown to assist the crop production by providing draught power. Above all, cattle were an asset to farmers, which provides collateral during purchase of farm inputs like fertilizers and improved seeds for the next crop production cycle. Moreover, cattle were also used for meat production.

##### 3.2.2 Cattle husbandry and management practices

**Feeds and feeding systems:** In the study area, natural pasture is the major feed resource, and crop residues are also source of feeds during dry season as there is no improved fodder production. Table 2 below shows that

majority (42.7%) of the households used animal feeds from their own crop farm/private land; while 27.3% used a combination of own farm and communal grazing land and 25.2% used only communal grazing land. In this system, milking cows are allowed to graze and there is no supplementary feeding. In the study area, the respondents did not use improved forages and the table 2 shows that of the interviewed, 91.6% of them had interest to take improved forages to feed their animals during the shortage of feed while the rest of them had no interest to take improved forages due to small land size they own. Moreover, 84.6% of the respondents had a land to sow improved forages if it is given or provided for them while the rest had no land.

Table2: source of feed

Source	Frequency	Percentage(N=140)
Natural pasture	104	74.3
Pasture and crop residues	36	25.7
	-	-

**Housing systems:** About 49.6% of respondents in Kaffa and Sheka zones dairy cattle owners have no house for their animals and kept their animals open out of their own residence while 50.4% kept their cattle within their own residence compound with open barn/shed. Among respondents those keep their cattle within their own residence compound with open barn, 74% clean the cattle's barn every day, 19% clean every week, 3.5% clean barn twice a week.

**Milking practices:** Out of the interviewed dairy cattle owners, 88.8% of households milked their cows twice a day while the rest milk their cows once a day. The average amount of milk per cow per day per liter is 1.74 liters. The high percentage of milking twice a day is similar to the milking frequency practiced in many parts of the country as Sintayehu *et al.* (2009) reported. Time of milking is normally in the early morning and late evening for twice/day milking. In the study area, farmers did not bother about the regularity of milking time.

**Calf rearing practices:** Most of dairy cattle owners (68.07%) in the study area practiced partial suckling before and after milking, while 15.4% practiced partial suckling prior to milking and 10.5% practiced partial suckling during milking. The colostrum is given freely to calves. Since local/zebu cows are believed not to give milk without partial suckling, local calves from such cows are not weaned early. The respondents in study area provided supplementary feeding for their calves after one month age.

### 3.3. Milk handling and processing

Cleaning of the teats and udder before milking contributes to hygienic milk production. The table 3 below shows that 60.8% of respondents practiced to sanitize teats and udder before milking while the rest did not practiced to sanitize teats and udder with the assumption that teats are cleaned when the calf suckles before milking. In fact calves are also allowed to suckle after milking to ensure complete milking. Moreover, as shown in the table 3 below, out of the interviewed majority of respondents (79.7%) wash their hands before milking while the rest did not given due attention to wash their hands. The hand cleaning materials are tap water and seldom have they used detergents like soap with tap water. In the study area almost all dairy producers do not wash their hands between cows. The 86% of respondents in the study area reported that milking personnel used own cloths during milking.

Table 3: milking practices

Milking practices (%)	Frequency(n )	Percent (N=140)
Twice milking	127	88.8
Hand wash before milking	114	79.7
Hand wash between cows	26	18.2
Udder wash	87	60.8
Use clean water	113	79
Use own cloth	123	86

Different types of utensils are used for milking, milk storage and processing in Kaffa and Sheka zones. Most farmers use gourds which are made of traditionally called ''Kell'' as well as clay pot. The dominant milk processing method across all the Kaffa and Sheka zones is traditional home processing method and it involves processing of fluid milk into fermented or sour milk, butter and cottage cheese (*ayib*). The table 4 below shows that majority (47.9%) of dairy producers used traditional churning material called clay pot while the rest used wooden 'Kell', both wooden kell and clay pot and plastic material.

Table 4: Type of milk churning materials

Milk churning materials in the study area	Frequency	Percent
Clay pot	67	47.9
Wooden kell	23	16.4
Clay pot and wooden kell	42	30
Plastic materials	8	5.7

### 3.4. Milk and milk product marketing

In the study area respondents reported that there was no formal marketing channels for milk and milk byproducts in the study area. Dairy farm owners as a result sell their milk and milk products informally to vendors or village consumers. Few producers located to near to urban areas sold their milk and milk products informally to hotels, cafeteria houses and direct to consumers. Report by Woldemichael (2014) is in agreement with this report and disagree with Adebabay (2009) and Negash(2012) studies that reported formal market was limited to urban and per-urban areas where collection of milk is possible. Zegeye (2003) and Lemma (2004) came with the same conclusion that both rural and urban milk is distributed from producers to consumers through the informal (traditional) means. Unlike Sheka zone, the practice of milk sell at Kaffa is not common in Gimbo district due to inefficient milk production and cultural restrictions (taboos) toward selling fresh whole milk followed by lack of market are the most common reasons reported. This result is similar to Belay *et al* (2015) whose report implies 21.3% and 19% of the women did not sell fresh milk mainly due to scarcity and cultural reasons, respectively in Horoguduru Wollega Zone. However, the most of households practice milk selling in rest of three districts. They stated that one liter of fresh milk was sold 14.9(±0.97), 13.93(±0.39) and 10(±0.44) ETB per liter on average at Chena, Masha and Andarech districts, respectively. On the other hand, about 33 and 61% of the respondents in the Kaffa and Sheka zone, respectively, stated that they sold cheese, while the rest of the respondents never sold, while 19% of the respondents did not sell butter. The average price of cheese was 35±2.041, 32.31±1.46 33.44±1.28 and 35±0.87 ETB per kg in Gimbo, Chena, Masha and Andarech districts, respectively. Butter is the most important marketed milk product in the study areas that the average price of butter in Gimbo, Chena, Masha and Andarech districts was 9.5 and 12 ETB per liter, 90 and 100 ETB per Kg and 25and 30 ETB per Kg during the wet and dry season respectively. 100±7.071, 101.54±3.89, 89.09±2.39 and 75.12±1.45, respectively. The mean prices of milk, ayib and butter were 14.04±0.36 per liter; 33.3± 0.91 per kg and 92.84±2.07 per kg. This result is higher when compared with results of Abebe *et al.*(2013) and lower than Shewangizaw and Adisu (2014).

Table 5: Marketing of milk and milk products in the four districts of Kaffa and Sheka zones

Districts	Average price ±S.E		
	Milk per litter	Butter per kg	Cheese(Ayib) per kg
Gimbo	0	100±7.0711	35±2.041241
Chena	14.91±0.97125	101.539±3.897	32.31±1.4561
Masha	13.94±0.391	89.0909±2.39	33.437±1.2786
Andiracha	10.01±0.441	75.124±1.452	35±0.8745
overall	14.0435±0.3611	92.843±2.0734	33.3±0.91037

As it is indicated in many studies like Belete (2006) Adebabay (2009) and Negash(2012) and Sintayehu *et al.*(2009), fasting season also the main determinant for milk marketing in the study areas During religious and some cultural festivals in the study area, dairy products were highly demanded. Thus, the prices of dairy products especially butter increase highly. Religious festivals of Ethiopian Christians such as ‘*Enkutatash*’ (Ethiopian New Year), ‘*Meskel*’ (Finding of the True Cross), ‘*Genna*’ (Ethiopian Christmas), and ‘*Fasika*’ (Ethiopian Easter) were the main ones when animal products are highly demanded that leads to high prices. In addition, the demand for dairy and other animal products increase during the locally celebrated festivals such as ‘*Meshikero*’ (which is Kaffa peoples’ New Year).

### 3.6. Constraints and opportunities of dairy production and marketing

Dairy producers in the studied areas prioritized the major constraints as lack of improved forage seeds, lack of awareness on cattle housing systems, limited infrastructure, lack of improved dairy animal, lack of dairy producing and marketing cooperative, knowledge gap on improved dairy production, processing and marketing. The extent and significance of the problems and constraints differed between and within the different studied areas. Of the interviewed respondents, about 95.8% face a problem of lack of improved forage seed due to improved forage planting and purchase concentrates are not adopted. In addition, conservation and utilization of available crop residues are not widely practiced due. On other hand, lack of feeder roads in remote areas where there is potential milk production that links producers with town markets.

Poor access to inputs and services includes extension, veterinary services, market information, AI and

dairy inputs is one the constraint reported by respondents in the study area. As farmers reported, the extension service has not satisfied the needs of farmers in terms of providing need-based service, hands on training and subject matter coverage tailored to different dairy production systems and market orientation. There is also a serious shortage of veterinary experts and limited access to veterinary service.

Despite the above constraints, in study areas there is longstanding and strong culture of consumption of dairy products that increase demand for consumption of milk was identified as an opportunity. In addition to raw milk, milk products such as butter, local cottage cheese, fermented milk (yogurt), ghee, butter milk, and whey are also commonly consumed. The increased population, very high rate of urbanization, improved income in some segments of the society, is also among the major driving forces that dramatically increase the demand for milk and milk products.

The existence of diverse agro ecologies coupled with diverse flora species rendered in the southwestern parts of country to have indigenous knowledge, specifically in the area of livestock production and dairy processing. For instance strong indigenous knowledge exists in the preservation of milk and milk products in the dairy system using various sources of herbs. On the other hand, Ethiopian government recognizes the importance of livestock in poverty alleviation and it has increased its emphasis on modernizing and commercializing livestock sector in recent years. Thus, government has established Ministry Livestock and Fishery as an authorized ministry in order to provide necessary support for the livestock sector. Development of infrastructural sector, such road access connecting towns with kebles are another opportunities.

#### 4. CONCLUSION AND RECOMMENDATION

The results in general indicate that the majority (42.7%) of the households use animal feeds from their own crop farm/private land, while 27.3% use a combination of own farm and communal grazing land and 25.2% use only communal grazing land. Out of the interviewed dairy cattle owners, 88.8% of households milked their cows twice a day while the rest milk their cows once a day. The majority (42.7%) of dairy producers used traditional churning material called clay pot while the rest used wooden 'Kell', both wooden kell and clay pot and plastic material. In the study area respondents reported that there is no formal channel for milk marketing. As a result dairy cattle owners practice informal milk marketing system. The major constraints for dairy development in the area include shortage of grazing land, lack of improved forage seed, and improved dairy breed, diseases, lack of awareness on housing system, limited infrastructure, poor access to inputs and services, lack of dairy marketing and processing cooperative and investors and knowledge gap on improved dairy production, processing and marketing. Thus, smallholder dairy producers should be supported through services related to improved forage supply, marketing systems, awareness creation on housing system, veterinary, AI, credit, extension and training. They also should be supported through increasing dairy market outlets by forming market oriented dairy producer and marketing cooperatives and improving infrastructure facilities in order to reduce transaction cost associated with distance from milk market outlets and market information.

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