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Assessment of Traditional Dairy Production, Milk Marketing and Processing System: In the Case of Alle Woreda, Segen Peoples Zone, Southern Ethiopia

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Abstract
The aim of this study was to assess marketing system and processing in AlleWoreda, Segen Area people of southern Ethiopia. A stratified sampling technique was used to different three Agro-ecologies and randomly sampling technique was implemented to sample and administer semi -structured questionnaires used and a total of 138households were selected from three kebeles. The targeted Kebeles were Kerkerte(Kola), Guma (W/dega) and D/mashille (Dega.). The collected data were analyzed using SPSS(ver.16,2007)package . Descriptive statistics such as means and percentages and summarized and presented by tables and graphs. The study show that the overall average milk produce per house hold (HH) per day for the three district Kebeles was 1.5 liters. Of the total milk produced per HH per day 100% was used for home consumption but not consumed before processed and milk was averagely stayed 2to 3 days for agitating and the form of processing was traditional. Traditional milk processing material identified in the study area was bottle gourd (Qille), clay pot and plastics (46.67%, 37.7% and 15.55%) respectively. About 48.89, 24.44, 17.77 and 8.89% of respondents used woyra, (oleaafrieana), Kollalhoo (Kusaye), Dawakkoo and Rukkatte, respectively, for smoking and washing traditional milk utensils. It was observed that 100% of the respondents in the study area do not sale whole milk due to cultural belief and they only sale butter. In the study area the major challenges for both production and marketing system were shortage of grazing land (37%), shortage of feed (24.43%), disease (24.43%), production system and socio culture (100%) and lack of market accessibility for milk respectively were identified. Factors affecting price of butter were, Season (dry season) and festival were prioritized in the study area. According to the present findings, there must be awareness creating training and intensive study in milk marketing and production system to overcome the cultural problem that hinders milk marketing in the area.
Keywords: Dairy production, milk marketing, milk processing, Alle

INTRODUCTION

Ethiopia has one of the largest livestock populations in Africa with the estimated domestic animals population of 52.13 million of cattle, 24.2 millions of sheep. 22.6 millions of goats, 2.5 millions of camel, 89 millions of poultry, 1.16 millions of hours, 0.37 millions of mules and 6.4 millions of donkey (CSA, 2012 and FAO, 2000).

The dairy system in the rural area which is a part of the subsistence forming and includes pastoral Agro-pastoral and mixed crop livestock producers urban and per-urban dairy systems. The first i.e. the pastoral, Agro-Pastoral and high lands mixed small holder production are contributes 89% (Zegeye, 2003).

Dairy production, their products are fundamental to the country economy but there is no significant improvement on the quality of dairy products from year to year milk and milk products, lay a very important role to the rural and urban population of Ethiopia and high nutritional value. It is a cash crop in the milk shade areas that enables families buy other food stuff even if the products are influenced by several factors (Sintayhu *et al.,* 2003).

The urban and peri-urban dairy production system is among the forms of dairy production in the tropics and sub tropics. The system involves production processing and marketing of milk products in the urban centers, The existence of urban and peri-urban dairy farming is mainly motivated by availability of good market for animal production s need for creation of employment opportunities (Ayago *et al.,*2005).

Ethiopian holds large population of dairy cattle, but production performance is low due to several challenges related to dairy production systems including lack of market oriented production lack of adequate information on livestock resources. In adequate permanent trade routes and other factors such as feed and nutrition water, holding grazing lands, lack of provision of transportation, insufficient and inadequate infrastructure, prevalence of disease, illegal trade and inadequate market information and socio cultural aspects are the major reason for sector of dairy production (Belachew, 2000). Low land holding for grazing, shortage of feed, prevalence of disease poor availability and seasonal variation of feed resources in both quality and quantity lack of adequate information on available livestock recourses, insufficient transportation facilities and inadequate infrastructure for production and socio cultural and environmental aspects are the major challenges of dairy production (Belachew, 2000) such reports coupled with a number of problems related to indigenous dairy cattle production and milk

marketing system in the AlleWoreda calls for systematic study. This study therefore, attempts to bridge the information gap in area.

Material and Method

The study was conducted at Alle woreda; is located at 640 km far from Addis Ababa, 410 km from Hawassa and 111 km from Gumayde which are the capital cities of Ethiopia, SNNPRS and Segen Area peoples Zone respectively in south western. The woreda has three agro-ecological zones such as Kolla, woynadega and dega with annual average temperature ranges from 19c^{o} to 28c^{o} from minimum to maximum respectively and annual average rain fall ranges from 480 to 800 mm. The altitude of the woredaranges from 500 m.a.s.l at Dullay through Golibte, Sharare and chickpea low lands to 2300 m.a.s.l at Goroze and Degamashille high lands and lies between 52^{o}N latitude and 37^{o}E longitude (AWAO, 2004)

The woreda has a total of 7650 ha of which 4640 ha used for crop-cultivation and the remaining 3050 hectors are covered with natural vegetation's. The production system of the area is mixed –crop livestock production system with crop cultivation as primary and livestock as secondary production (AWAO, 2004). The major crops grown in the area includes, Dagussa/Millet, maize, *teff*, mashilla/sorghum and at high lands *enset* is recognized. The major livestock were cattle (64%) goat (70%) sheep (45%) is found at low lands and rarely horses and donkey are found at high lands of the study area (AWAO, 2004)

Sampling procedure

The woreda has 17 kebeles and it has three agro-ecological zones. Then the woreda stratified in to three on the agro-ecological difference as well as differences in the livestock holding per households. Then three kebeles were selected from the total of 17 kebeles in which one kebeles from kola, woina-dega and dega respectively were selected randomly. Finally the household was selected purposively based on milk production potential, owing milking cows and marketing of milk and its products. 46 households were selected from each kebele i.e Kerkerte, Gma and Dega Mashile kebeles repectively and a total of 138 households were used for the study.

Data collection

Both primary and secondary data were used in the study. Primary data were collects through interview by using semi-structured questionnaires after translated in to *Alegna* language and discussed with the owners of dairy cattle. The questionnaires assessed the production system, constraints, opportunities and milk marketing system and challenges on milk market in the study area. Secondary data on socio-economic characteristics, agricultural production system farming practices and description of the kebeles were collected from Alle woreda agricultural office.

Data Analysis

Both the primary and secondary data were analyzed by using descriptive statistics such as mean and percentage and summarized and reported by using tables, graphs and charts.

RESULTS AND DISCUSSION

Socio-economic house hold characteristics

House hold characteristics of the respondents are shown in the table 1 below. The average age of the respondents was 45 years. Average family size was 6.3 per house hold. The observed family size was lower than the reported of (Asaminew and Eyasu, 2009) who reported that average family size of 8.2 and 7.2 in Bahir Dar zuria and Mecha districts respectively.

The majority (88%) of the respondents was illiterates and the remaining 12% had attendee early primary school that was not proceed over third classes. The respondents in the study area were in contrast to the report of Yousuf (2003) who indicated 24% respondents in Harar milk shed had higher educated. The study indicates that dairy farming is mainly by male house hold (78%) where as only 22 were women. Similar observations have been reported in Addis Ababa milk shed by (Azage, 2004).

Dairy Production system in the study area

All of the respondents in the study area undertake dairy production system i.e. mixed farming system by combining with crops like coffee, *enset*, mostly in the Dega agro-ecologies and others like, maize, dagussa, *teff*, cow pea etc which were seen in every parts of the study area. Besides, dairy production and its product marketing is the major source of income in the area. Almost all(100%) of the respondents reported that milk production is source of income in the area enenthough marketing of whole milk is regarded as taboos among community. This is similar to the report of(Teshager *et al.,* 2013) in Algie district Illu Aba Bora zone Oromia region.

Dairy production challenges in the study area

Figure below shows that, the major challenges of dairy production in the study area. The major challenges that were reported by respondents and prioritize were shortage of grazing land, shortage of feed, animals diseases and housing system were the major challenges for dairy production in the study area.

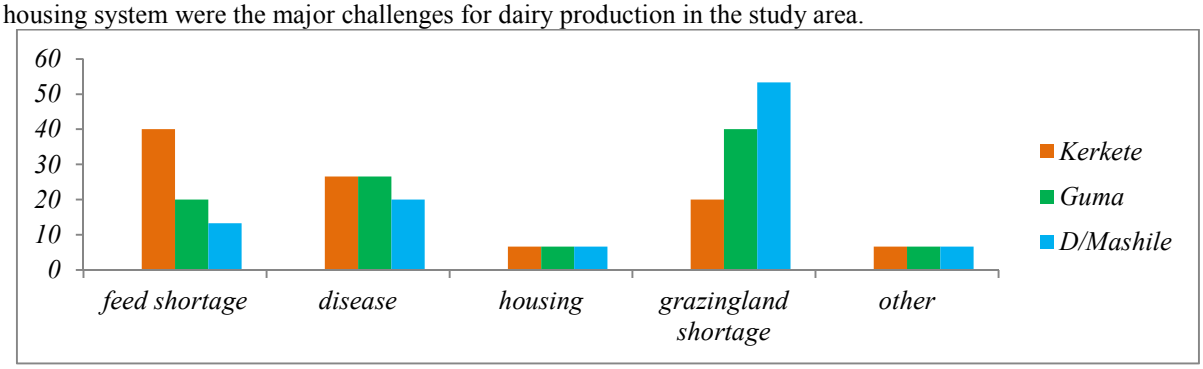

Figure 2. Major challenges of dairy production in the study areas

From the above figure, sever challenge of dairy production identified in the study area was shortage of grazing land as number one but this is not seen in Kerkerte peasant Association in contrast shortage of feed is the sever problem in Kerkerte peasant association due to high population of cattle and the second one is the disease. On the other hand, in dega and woina dega the sever problem was shortage of grazing land due to population (human) density and the shifting of grazing land to crop land that leads shortage of grazing land and averagely accounts 37.76%. Similar report was reported by Daniel (2000), who indicated that shifting of natural pasture to crop cultivation and deterioration and fragmentation grazing land was the serious problem for livestock production in Bahir Dar Ethiopia.

Opportunities of dairy production in the study area

Even though, many challenges that may hinder the development of the dairy in the study area, the majority of dairy producers (65%) households were willing continue expand (involved) in dairy. Because the farmers save their money in the forms of live animals (30%), huge population of indigenous milking cows(25%) and high demand of milk product (Butter) in area and 10% due to diverse conformable agro-ecology. This is similar to report of (Ayenew *et al*., 2009 and Belete *et al*., 2009). Even if there is socio-culture that hinder marketing of whole milk, butter milk is commonly sold in the area and there is opportunity of road access, availability of grazing land (38%) and 62% respectively the respondents have the opportunities to milk production.

Milk Production in the study Area

Table1*: Milk production per cow per day with tow milking intervals*

Variable	**Kebeles**						
	Kerkerte		***Guma***		***Degamashille***		***Overall mean***
Milk yield day in liter	***Freq***	***P(%)***	***Fre***	***P(%)***	***Freq***	***P(%)***	
0.5	11	23.9	3	6.5	12	26.0	18.8
1	15	32.6	17	36.95	11	23.9	31.1
1.5	15	32.6	22	47.8	17	36.9	39.1
2	5	10.87	4	8.7	6	13.0	10.8

Fre=frequency

In the above table, the study indicates that about 39.1% of the respondents produce 1.5 liter of milk per cow per day at two milking intervals. This report is in contrast with the report of Teshager *et al* (2013) reported that 2.78 liter cow/day in Illu Aba Bora area western Ethiopia Oromia regions and nearly similar with national milk yield per cow per day 1.54 liter from indigenous cow breed (CSA, 2008).

Milk production and utilization in the study Area

Milk and its product utilization pattern varies in the study areas as; used for calves, consumption for family and sold to purchase family commodities. The overall average milk produced Dega Mashile peasant association showed higher milk production than the other two peasant association. This may be due to suitability of the environmental condition and ample feed rather than the number of cows holding. the report is in contrast with the report of Teshager *et al* (2013) in Bacho districts showed higher milk production due to high milking cows potential in the district and reported 2.87 liter /HH/ day. Of the total milk produce per day 100% was reserved for

processing into butter and consumption after processed into butter milk. This result is in-contrast with the report of Teshager *et al* (2013), who indicated from total milk produced per day 45.5% was used for house hold consumption 44% was reserved for subsequent processing and the remaining 10% was marketed.

Traditional milk processing in the study area

In the study area, of total milk produce per households per day averagely 1.5 liters and was processed in to butter and butter milk after 2 to 3 days reserving until sufficient for a gaiting. The study revealed that 71% of the respondents process produced milk in to butter and butter milk averagely after 2 to 3 days. This report is lower than the report of Teshager *et al* (2013) Who reported 84% produced milk processed every 2 to 3 days in western Ethiopia Illu Aba Bora Zone of Oromia Region.

Table 2:- *Traditional milk processing in the study area*

Variable	*Kerkerte*		*Guma*		*Degamashille*		*Overall mean %*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Milk processing	46	100	46	100	46	100	138	100
Every one day	11	23.9	13	28.3	18	39.1	42	30.4
Every two day	16	34.8	11	23.9	15	32.6	42	30.4
Every three day	13	28.3	14	30.4	9	19.6	36	26.08
Every four day	6	13	8	17.4	4	8.7	18	13.04

Traditional Butter processing in the study area

In the study area, for butter making first all the milk is soured (Ergo) for 1-4 days to coagulate and sour milk, then is churned using two-third filled bottle gourd (*Qill*) or clay pot by using quarter dividing stick (*mekisfia*) until the butter is separated from the butter milk and then butter is collected and washed with cold water. The procedures of butter process are similar with the report of Alganesh(2002) in east Wollega. For processing butter, farmers in the study area used different herbs or plants for smoking and washing milk storage equipment.

Table 3:- *Major herbs plants used for smoking and washing milk equipments*

Variable	***Kerkerte***		***Guma***		***Degamashille***		***Overall mean %***	
	N	***%***	***N***	***%***	***N***	***%***	***N***	***%***
Egergo'o (Woyra)	8	53.33	7	46.67	7	46.67	22	48.89
Kollalho'o (Kusaye)	4	26.67	4	26.67	3	20	11	24.44
Dawakko	3	20	2	13.33	3	20.5	8	17.77
Rukkate	-	-	2	13.33	2	13.33	4	8.89

Traditional milk processing equipments

Traditionally, different containers available in the study area were used for milk storage and processing are shown Table (4) milk storage and processing materials were traditional which in true affect milk quality and marketability. Milk processing is based on natural ferment /sour milk). Sour milk processed in to butter using traditional materials such as clay pot (37.7%) bottle gourd (46.67%) and (15.5%) plastics. The use of bottle gourd lower than the report of Alganesh (2004) 91% of the farmers of dairy producers used bottle gourd for churning in Ethiopia, Wollega. The respondents in the study indicated that the traditional milk processing materials and methods used were time consuming laborious and in efficient in terms of fat recovery

Table 4: *Milk storage and processing equipments used in the areas*

Parameter	*Kerkerte*		*Guma*		*Degamashille*		*Overall mean %*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Plastic	9	19.6	12	26	16	34.8	57	41.3
clay pot	25	54.4	20	43.5	13	28.3	58	42.0
Bottle gourd	12	26	16	34.8	17	36.9	45	32.6

Marketing of milk and butter in the study area

In the study area selling row milk especially whole milk is regarded as cultural taboo. This report is similar with the report of Teshager *et al* (2013) in Illu Aba Bora, Algie district south western Ethiopia Oromia regions. This indicates that local tradition as cultural taboo hindering or affecting milk marketing in the study area and only product to be sold is butter.

Price of butter in the study area

The overall average price of butter for the study area was averagely 110 in ETB/kg with range of 90-130 birr in (ETB). This report is higher than the report of (Teshager *et al.*, 2013). In Illu Aba bora Zone south western Ethiopia who point that 60.99 ETB/kg. Even if the report is higher than the report of Tehsger *et al* (2013) it is lower than

the national price of butter around Addis Ababa, Wolaita, Arba minch and Hawassa that about 200 birr in (ETB/kg. In the study area there is high price changes during wet seasons, dry seasons and periods of festivals from average 110 birr ETB either decrease or increase i.e. 15% decrease during wet season and increase 30% in festival and 55% in dry seasons. Even if such an increment in price of butter it is lower than other towns (Wolaita, Arbaminch and Hawassa) and it indicates low market for butter in the study area.

Constraints of milk marketing in the study area

The study indicates that, the major challenges of dairy production marketing the respondents in the study area identified and ranked the challenge milk markets as shown in the figure 3.

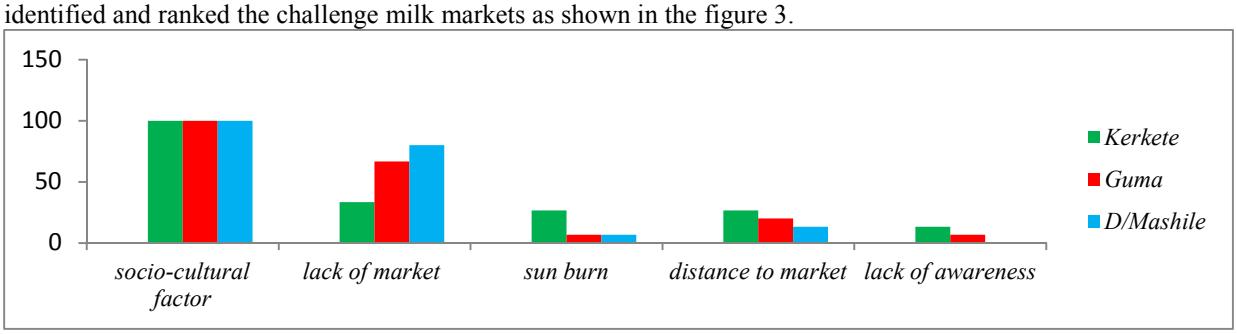

figure3: factors affecting milk marketing in the study areas

As indicated in the above figure, major challenges of milk marketing in the area socio-cultural factors, lack of market access, sun burn , distance to market and lack of awareness. This report is different from Amistu *et al* (2015), who reported Major challenges of milk marketing; price fluctuation during fasting months, distance to selling centers and/or market, long term contracts, milk quality, lack of quality based pricing system from finfine surrounding Oromia. As indicated above 100% cultural beliefs affect the marketing of milk. The report is similar with the report of Teshager *et al* (2013) In Algie district Illu Aba Bora Zone south western Ethiopia. 100% socio-culture that hinders the development /Accessibility of market for milk in the study area.

Opportunities of Milk marketing in the study area

As indicated by different authors, diversification of agro-ecological zone, availability of huge areas of communal grazing land availability of indigenous fodder tree, huge number of indigenous or local cows, market availability, presence of transportation facility regarded as an opportunity for milk production and marketing(Kedija, 2008; Azage *et al*.,2004; and Teshager *et al.*, 2013). The present finding indicate that availability of road and high demand of butter and other dairy product in area and nearby towns is regarded as an opportunity of product marketing. Even if there is socio-culture that hinder marketing of whole milk, butter milk is commonly sold in the area and there is opportunity of road access and availability of road (38%) and high demand for milk products in area(62%) respectively the respondents have the opportunities to milk production.

Conclusion

The mean number of milking cow per house hold was two cow HH/ that varied from the peasant association to other with higher in example kerkete peasant Association. Milk production in the study area was assessed and on average 1.5lt HH/day produced and processed in to butter and butter milk in the study area. In study area, peasants use different herbs like woira, kolalho'o (kusaye) dawakkoo and Rukkatte for washing and smoking milking and storage equipments and the major equipment available for milking and milk storage were identified as bottle gourd, clay pot and plastics were recognized.

Marketing of whole milk in the study area is considered to be cultural taboo. This was the crucial factor which affects and hinders the milk market and development of market for milk in the study area. Traditional milk processing in to butter is time consuming and laborious and it is better to in traduce new technology which minimize extensive labor and saving time for milk processing.

The major challenges of both milk production and marketing in the study area were shortage of grazing land shortage of feed and disease prevalence for dairy production and socio cultural beliefs, lack of market accessibility distance to market and sun burn in the market are the major challenges in the milk product marketing.

Recommendation

The extension worker /development Agents/, NGO's and other responsible bodies should aware the farmer to avoid the culture related issues on milk and product markets. Low production of milk due to local breed it is better to introduce cross bred or AI to increase the production of milk. The processing of milk and milk product was laborious because of use of traditional processing methods and materials in the study area and it is better to introduce new technologies which save time, labor and fat recover in the study area.Due to the low production and

increase period of storage milk and results development of spoilage, it is better to introduce cross breeds to increase the production reduce the time of storage for recovering fat and safe for consumption.

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