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Marketing of Dairy Products in Selected Districts of Wolaita zone, Southern Ethiopia

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Abstract
The study was conducted to assess dairy products marketing from January to May 2015 in Wolaita Zone, Southern Ethiopia. To undertaken the study, multistage sampling method was used and data was collected from both primary and secondary sources. The collected data was analyzed statistically using SPSS (version 17) for windows by using descriptive statistics and general liner model. The study showed that the respondents had multiple reasons for the cause of increasing demand of milk and milk products, of which the combination of due to dry season, holiday and festivals and fasting (52.3%); dry season and non fasting (23.9%) and only dry season (12.8%) were the major one. Most of the interviewed respondents sold their dairy products through formal marketing (85.7%) while the rests did sell through both formal and informal alternatively. About 41.9, 41.0, 14.3 and 2.9% of the respondents sold to their dairy products to consumers directly; directly to consumers and retailers, only to retailers and cooperatives, respectively. As indicated by respondents, cooperative marketing was not well developed in the study area. The study was also reported that the respondents had never sold fresh (whole milk), butter milk, fermented milk (yogurt/*ergo*); whey and ghee but they only sold both butter and cheese. Out of 150 interviewed farmers 53.29, 48.68, 39.47, 38.82 and 44.74% sold butter in dry season, wet season, fasting period, no fasting period, and holidays and festivals period, respectively while 23.68, 20.39, 18.42, 20.39 and 20.39% of the respondents sold cheese respectively in dry season, wet season, fasting period, no fasting period, and holidays and festivals period.

The results of the study indicated that the price of the butter was sold 134.79±1.6 Birr/kg in average. The price of butter was significantly ($P<0.05$) vary across agro-ecology (location) in all parameters (during wet season, dry season, fasting, no fasting and holidays and festivals periods); the farmers of lowland areas sold butter in more expensive price than midland. As indicated in the study, the butter marketing price was also significantly different due to effect of selling time in the overall result as well as in each agro-ecology (low land and mid land). The price was significantly lower in wet season in both low land and overall results while in mid land, the price was equally significantly lower in both, wet season and fast period. On the other hand, the highest price was reported in holidays and festivals periods, dry season and none fasting periods in both lowland and overall result; but in mid land area, only in holidays and festivals periods was reported highest price. However, the marketing price of cheese was insignificantly different across agro-ecology (lowland and midland). But it was significantly differ cross influencing of selling time (during wet season, dry season, fasting, no fasting and holidays and festivals periods) in both agro –ecology midland and low land and in overall result at 5% level of significant. It was concluded that in the study area, of the dairy products only both butter and cheese were sold and the sale price of milk and milk products was not consistent across years it was varying due to the effect of season, holiday and festivals, fasting and no fasting condition

Introduction

The Ethiopian economy is highly dependent on agriculture. Agriculture accounts for 46.3 percent of the nation's Gross domestic Product (GDP), 83.9% of exports, and 80% of the labour force (FAO, 2004). Of the agriculture, the livestock subsector plays a vital role in Ethiopian economy such as source of food, income, services and foreign exchange; contributes to 12 and 33% of the total economy and agricultural GDP, respectively, and it accounts for 12–15% of the total export earnings of importance (Ayele et al. 2003).

The dairy industry occupies a special position among the other sectors of livestock .Milk is produced everyday and gives a regular income to the numerous small producers. Milk production is highly labour-intensive and provides a lot of employment (IDF, 1996). In addition, dairy production plays significant role as a source of additional income to the farming community through sale of raw milk, processed milk products and live animals (EEA, 2002). It is estimated that almost 150 million farm households, i.e. more than 750 million people, are engaged in milk production worldwide, the majority of who are in developing countries (FAO, 2010).

In Ethiopia, milk is mainly obtained from cows, and it is usually processing (Layne et al., 1990) and the processing of milk is generally based on *ergo* (fermented milk in Ethiopia) with natural starter culture (Zelalem and Faye, 2006) thereby the fermented milk is further processing in to butter milk, cottage cheese, butter and why etc. for the purpose of consumption and sale (Habtamu, 2015).

Milk is the most complete food item because of its great biological value as it contains a variety of

nutrients and these nutrients in milk help make it nature's most perfect food (Melesse and Beyene, 2009). Therefore, plays an important role in improving human nutrition especially for growing children, pregnant women, the sick and the old of the smallholder household members as whole. However, in Ethiopia consumption during the last four decades ranged from 16 to 19 liters per capita; about half of the average African consumption rates, and highly below the world average. The level of consumption has only increased slightly since 2000(FAOSTAT, 2010). approximately 17 kg/capita (LDMPS, 2007) and it is approximated to 83% of the total milk produced which is consumed at the household level and only 7% is supplied to the formal and informal markets. The remaining balance is distributed between in-kind wages (0.43%), and used for processing local butter, yogurt, and cheese (10.06%) primarily as a means of extending the shelf life during times of surplus(in urban). But in rural area milk in is mainly consumed in fresh (whole milk). Processed milk is currently not sold in rural markets. In the rural areas, producers will consume fresh milk and will convert their milk to butter. It is estimated that 40% of the milk produced is converted to butter, while only 9% is converted to cheese (LDMPS, 2007).

Dairy marketing is one of the key constraints to the development of dairying in sub-Saharan Africa in particular in Ethiopia (Brokken and Senait, 1992). Because marketing situation of dairy product is a determinant factor for types of production systems which would practice. More ever, marketing system of dairy product matter of benefit gain whereby producers exchange their animal and dairy products for cash. The cash is used for acquiring goods and services which they do not produce by themselves. So, marketing problems must be addressed if dairying is to realize its full potential to provide food and stimulate broad-based agricultural and economic development. As a result, information of the dairy product marketing is vital input for improvement of dairy cattle production sector in the country in particular in the study area. However, there was limited documented information on regarding of marketing of dairy products in the study area. Hence the study was undertaken to assess marketing of dairy products Wolaita zone, Southern Ethiopia.

Material and methods

Description of the study area

The study was conducted from January to May 2015 in Wolaita Zone, Southern Ethiopia. The study area is located in 6.4° to 7.1° north latitudes and37.4° to 38.2° east longitudes, and it covers a total area of 3, 982 km2. Its altitude ranges from 1,200 to 2,950 m above sea level (masl), and it is subdivided into three agro ecological zones, namely, kolla or lowland (35%, <1,500masl), woina dega or intermediate highland (56%, 1,500 to 2,400 masl) and dega or highland (9%, >2,400 masl). Wolaita Zone has a bimodal type of rainfall pattern. The major and minor rain seasons usually last from June to September and March to May, respectively. The average total annual rainfall is 1,014 mm, and the mean daily temperature is 19.5°C (WZFEDD unpublished report, 2005).

Sampling method

In current study area, multistage sampling method was used. In the first step, Humbo and bolesoserea woredas were selected randomly from each agro-ecology, lowland and midland woredas respectively. In second step, three districts from each selected Woreda were selected randomly thereby a total of six districts were selected. In similar way, from each selected districts, 25 households were selected purposively farmers who have dairy cattle. Thus, a total of 150 households were selected for interviewee survey study. However, some households were not committed to response the questions requested by researchers. Even though, more 100 farmers committed in giving response of requested questions in some parameters; on the other hand, in some other parameters the respondents were below this one.

Data collection

Data was collected from both primary and secondary sources. The primary sources were obtained through a semi-structured questionnaire; it was pre-tested the questionnaire before the actual data collection was carried out so as to evaluate the appropriateness of clarity of the questions, and interpretation of the questions by the farmers and time required for an interview. The feedback from the pre-test was used to implement for the final questions. The interviews were conducted by trained research assistants under close supervision by the researcher while the secondary data were collected from different sources such as books, research publications, journals, office reports of zonal and woredas agriculture etc.

Data analysis

The collected data was analyzed statistically using SPSS (version 17) for Windows. The qualitative data were analyzed by using the descriptive statistics (percentage values). While the quantitative data were analyzed using general linear model (GLM) and the means were compared using Duncan's multiple range test. The values were considered significant at $p<0.05$.

Result and discussion

As different scholars indicated that in Ethiopia, domestic demand of dairy products (milk) has increased erratically overall and unevenly cross countries, the reasons for increasing are due population explosion, urbanization and income are more rapidly increase. If marketing opportunity is created the increasing demand will make dairying profitable in a large number of areas. Hence, farmers would have several marketing channels from which they can choose. As result, they can avoid exploitation by traders and the negative effects of government monopolies. More ever, there are significant opportunities to develop small-scale processing plants to serve smaller urban settlements and milk sheds. Underutilization of capacity is a major problem for the dairy-processing industry, and (imported) milk powder may be important in ameliorating it (Brokken and Senait, 1992). According to respondents, the sale price of milk and milk products was not consistent across years it was varying due to the effect of season, holiday and festivals, fasting and no fasting condition in the study area. As reveal from Table 1 the respondents had multiple reasons for the cause of increasing demand of milk and milk products, of which the combination of due to dry season, holiday and festivals and fasting (52.3%); dry season and no fasting (23.9%) and only dry season (12.8%) were the major one. Most of the interviewed respondents sold their dairy products through formal marketing (85.7%) while the rests did sell through both formal and informal alternatively. The formal market was sold milk products in market places and directly to cooperatives, while informal market involves direct delivery of the product to consumers in the immediate neighborhood or nearby village home.

About 41.9, 41.0, 14.3 and 2.9% of the respondents sold to their dairy products to consumers directly, directly to consumers and retailers, only to retailers and cooperatives, respectively (Table1). As indicated in the result of the study, cooperative marketing is not well developed in the study area, the main problems for that was due to small quantities dairy products are supplied per farmer, seasonal fluctuations in supplies, poor and seasonally impassable roads, low level of education about collection and preservation of quality milk. Moreover, the dairy cooperatives has problems in contributing to efficiency to farmers due to irregular and delayed payments, inefficient plant operations and in most case the dairy cooperatives are nominal, they are not working in proper manner in the study area. Unfortunately, however, dairy cooperatives are important to farmers in reducing transportation cost and save time. Cooperatives are also vital to give producers a guaranteed access to market and sell their milk. So, establishment of milk cooperatives can give dairy farmers a broader choice of marketing their milk instead of depending on local traders and neighborhood buyers.

In similar to the results of current study, Fikrineh et al. (2012) study from the areas of Mid Rift Valley of Ethiopia who reported that 71.3, 59.2, 21, 3.3 and 2.2% of respondents sold their dairy products to local market, home, dairy cooperatives, shop and cafeteria, respectively. In similar manner, Woldemichael (2008) also reported from Shashemane, Hawassa and Dale district's milk shed, Southern Ethiopia butter and different milk products are sold from producer to traders, cooperatives, semi-whole sellers;, retailers, itinerate traders/hawkers and consumers. In lined to current study, Holloway and Ehui (2002); Muriuki and Thorpe (2001) had also reported in their study the marketing system, in Ethiopia is not yet developed to market milk and milk products the possible reason for low marketable outlet of dairy product are due to producers and consumers are spatially separated; most producers are found in the rural areas while consumers or profitable market is found in urban areas. Most of the milk supply is distributed from producer to consumer through informal marketing channels in both rural and urban areas. Market infrastructures and marketing facilities are not well developed in the country. This, in turn, reduces incentives to participate in economic transactions and results in subsistence rather than market-oriented production systems. However, the current result disagreed to Eyassu and Asaminew (2014) result in Bahir Dar Zuria and Mecha districts, Northwestern Ethiopia who indicated that the majority of farmers use an informal marketing system to sell their milk and milk products to neighbors or in the local markets. Inconsistence to current result, Woldemichael (2008) from Shashemane, Hawassa and Dale district's milk shed, Southern Ethiopia indicated that dairy products marketing are affecting by season (Kiremnt and Bega), social festivals and fasting periods. The price of butter and milk is reach its peak during the big social festivals, no fasting periods and summer (Bega) season when the economic activities become high and its lean during fasting period and winter (kiremnt) season when economic activities become low.

The current result is also in agreement to Eyassu and Asaminew (2014) report in Bahir Dar Zuria and Mecha districts, Northwestern Ethiopia who indicated that about 55.9% of the respondents reported that there is less demand for dairy products during fasting time, while 44.1% of the respondents reported the rainy season (Kiremt) as a marketing problem due to the increase in milk production and the concomitant decrease in price of dairy products. The majority of people living in this region are followers of Orthodox Christian faith and thus do not consume dairy products especially during the Easter fasting period.

Out of 150 interviewed farmers 53.29, 48.68, 39.47, 38.82 and 44.74% sold butter in dry season, wet season, fasting period, no fasting period and holidays and festivals period ,respectively while 23.68, 20.39, 18.42, 20.39 and 20.39% of the respondents sold cheese respectively in dry season, wet season, fasting period,

no fasting period and holidays and festivals period (Table 2). As it was discussed with respondents of farmers they had never sold fresh (whole milk), butter milk, fermented milk (yogurt/*ergo*), whey and ghee etc. but they sold only these, both butter and cheese. This was due to lack of marketing opportunity nearby their home because milk is naturally easily spoiled especially, if it is not refrigerated or preserved (in processed manner). However, such storage and processing facilities are not easily available in rural areas due to lack of the required dairy infrastructure and when available high cost of facilities such as refrigerator for resource poor smallholder producers (O'Mahony and Peters, 1987). However, in relatively to other products, butter and cheese can keep consistency their nature without spoiling for certain period of time till marketing place. The current result is in agreement to Fikrineh et al. (2012) reported from the areas of Mid Rift Valley of Ethiopia who indicated that only butter and cottage cheese are marketable dairy products which sold by 40.4% of the respondents. However, in contrarily to the current result Tesfaye (2007) reported that selling of traditional cottage cheese (Ayib) is not observed rather it is consumed by the family and given to animals (calves and pet animals) together with the whey (Aguat). The current result is also disagreed to Eyassu and Asaminew (2014) resulted in Bahir Dar Zuria and Mecha districts, Northwestern Ethiopia who indicated that all fresh whole milk, butter, spiced butter and Metata Ayib are sold; of which butter is the major dairy product sold by farmers however, in similar to current study, they never sold Ayib, Ergo, whey or Zure in the market.

Table 1: Factor cause to increases milk and milk products demand, sale place and purchase person/institution by respondents in percentage (%)

At what time do demand of milk and milk products increase?(N=109)	**(N)**	**%**
Dry season	14	12.8
Non fasting period	1	0.9
Holidays and festivals	3	2.8
Dry season and holiday and festivals	1	0.9
Dry and wet season	1	0.9
Dry season and non fasting	26	23.9
None fasting period and fasting	5	4.6
Dry season holiday and festivals and fasting	57	52.3
Dry season, none fasting period and fasting period	1	0.9
Where do you sell your milk and milk products(N=105)		
Only formal	85.7	85.7
Both formal and informal	14.3	14.3
To whom you sell your milk and milk products?(N=105)		
Direct to consumers	44	41.9
Retailers	15	14.3
Cooperatives	3	2.9
Direct to consumers and Retailers	43	41.0

N= number of respondents

Table 2: percentage (%) of respondents' sale butter and cheese in the study area

Parameters	**Percentage (N=152)**
Respondents sale butter	
During dry season	53.29
During wet season	48.68
During fasting period	39.47
During none fasting period	38.82
During holidays and festivals	44.74
Respondents cheese butter	
During dry season	23.68
During wet season	20.39
During fasting period	18.42
During none fasting period	20.39
During holidays and festivals	20.39

N= number of respondents

The results of the study as presented in Table 3 and 4 indicated that the price of the butter was influenced by selling of time and agro-ecology (location) which was 134.79±1.6 Birr/kg in average. The average price of butter observed in the current study is significantly higher than that of reported by Tola (2002) who indicated an average price of butter 15.4 and 27.78 Birr/kg for the rainy and dry seasons, respectively in eastern Wollega western Ethiopia. The reason for variation of marketing value of butter in the two studies might be due

to the effect of inflation occurs in the current situation since then. More ever, demand of animal origin food is increasing since then due to urbanities and income increasing in the country Ethiopia as whole. The results from Table 3 indicated that the price of butter was significantly ($P<0.05$) vary across agro-ecology (location). In all parameters (during wet season, dry season, fasting, no fasting and holidays and festivals periods), the farmers of lowland areas sold butter in better price than midland in other words, the marketing price of butter in lowland areas was more expensive than midland areas. The reason might be related to, as observed and discussed with respondents of farmers during data collection, selling of butter by farmers was not common in lowland areas as compared to mid land areas; because as suggested by farmers (respondents), the farmers of lowland areas are not well experienced in processing of milk (fermenting of milk to produce butter, cheese, yogurt, whey, etc.) Moreover, the farmers of lowland areas usually adapt to consume fresh milk as crop production for consumption is poorly produced due to frequent drought occurrences in the area. Thus they could supple less butter amount to marketing place and it is obvious that as the amount of butter supple to market becomes decrease, the price becomes expensive.

As indicated in Table 4, the butter marketing price was significantly different due to effect of selling time in the overall result as well as in each agro-ecology (low land and mid land). The price was significantly lower in wet season in both low land and overall results while in mid land, the price was equally significantly lower in both, wet season and fast period. On the other hand, the highest price was reported in holidays and festivals periods, dry season and no fasting periods in both lowland and overall result; but in mid land area, only in holidays and festivals periods was reported highest price. In similar manner, the marketing price of cheese was sold in lower price in wet season while it was reported higher in holidays and festivals period but the result was no found any significant different across agro-ecology (lowland and midland). However, it was significantly differ cross influencing of selling time (during wet season, dry season, fasting, non fasting and holidays and festivals periods) in both agro –ecology midland and low land and in overall result at 5% level of significant(Table 3and 4).

The reason for having such variation of marketing price of dairy products (butter and cheese) due selling time might be due to the fact that as it was discussed with respondents', the farmers in wet season they have sufficient amount of forage for their dairy animals. Thus the cattle would give better milk production for dairy products processing (yogurt, butter, cheese etc.) in turn the marketing price being low. In similar case, in fasting period some people are abstaining from animal origin food consumption for certain period of time as result the price become decreases. However, in holidays and festivals periods and no fasting periods more people are consuming dairy products so that the marketing price become increase while in dry season the farmers are usually challenging feed shortage for their cattle. Thus dairy products become low in production at the hand of farmers and market level.

Therefore, the key challenge for dairy sector development in Ethiopian, in particular in the study area is, mitigating of the seasonality that affects both supply and demand. The seasonal mismatch between dairy supply (shortage in the months before the rainy season) and demand (drop during fasting months) warrants investment in prolonged shelf life for milk. Seasonal fluctuations in the demand of dairy products follow the various fasting periods during which orthodox Christians will abstain from consuming all kinds of animal product foods. In overall, there are 196 fasting days in a year. Producers are mostly affected by the seasonal fluctuations as processors adjust the milk they collect according to the prevailing demand and or reduce their purchasing price. Most processors also produce long shelf life dairy products (Such as butter and cheese) to be sold after the fasting season. However, producers do not have the means to process and store their milk (Sintayehu et al., 2008). Gezahegne et al., (2006) also supported the current result of study average price animal products is varying across the country. This difference may be because of the fact that the livestock market prices in most parts of the country are characterized by season and there is prices variation of live animals and animal products. Supply of the livestock and livestock products does not occur at a uniform pattern, supply fluctuates from time to time and from place to place). It is the facts that prices of livestock and livestock products depend mainly on supply and demand, which is heavily influenced by the season of the year and the occurrence of religious and cultural festivals (Daniel, 2008). Nearly in all parts of the country, there is no regular market information on prices and supplies (Ayele et al., 2003). Availability and price of live stock are very volatile as there may excess supply of animals beyond demands in some seasons and in contrary to, during other seasons there is less supply to market (Daniel, 2008). There is less supply of animals to the market during rainy season as farmers are usually engaged in other farming activities at these times hence the price is usually high during that period. Availability of good pasture is also another factor contributing to (Gezahegne et al., 2006).

Table 3: Least square means (±SE) of butter and cheese sale (in Birr/kg) in different agro- ecology

	Agro-ecology		
Parameters	**Midland N(LSM±SE)**	**Lowland N(LSM±SE)**	**Total N(LSM±SE)**
Butter sale price in kg by respondents			
During dry season	49(136.12 [a]±2.32)	32(160 [b]±5.26)	81(145.56±2.8)
During wet season	45(104.58 [a]±23.56)	29(114.83[b]±14.29)	74(108.59±20.93)
During fasting period	37(108.92 [a] ±3.6)	23(142.61 [b]±7.28)	60(121.83±4.13)
During non-fasting period	39(133.97 [a] ±2.85)	20(165.5 [b]±5.05)	59(144.66±3.19)
During holidays and festivals	46(144.04 [a] ±2.61)	22(172.73[b]±4.32)	68(153.32±2.77)
Cheese sale price in kg by respondents			
During dry season	29(43.45±4.47)	7(43.45±5.23)	36(41.81±3.76)
During wet season	23(29.57±2.06)	8(27.5±4.23)	31(29.03±1.85)
During fasting period	20(31±1.76)	8(31.86±3.77)	28(31.25±1.62)
During no fasting period	23(39.57±2.59	8(42.5±6.94	31(40.32±2.57)
During holidays and festivals	25(48.28±3.62	6(47.5±6.29)	31(48.13±3.12)

LSM= least square means, SE= Standard error, N= Number of observations, Means within the same row in two agro-ecology, in the same parameters' with different super scripts letter are significantly different (p<.05).

Table 4: Least square means (±SE) of butter and cheese sale (in Birr/kg) in different selling time

	Agro-ecology		
Parameters	**Midland N(LSM±SE)**	**Lowland N(LSM±SE)**	**Total N (LSM±SE)**
Butter sale price in kg by respondents			
During dry season	49(136.12 [bc]±2.32)	32 (160 [c] ±5.26)	81 (145.56 [c]±2.81)
During wet season	45 (104.58[a]±3.51)	29(114.83[a]±2.66)	74 (108.59 [a]±2.43)
During fasting period	37 (108.92 [a] ±3.61)	23(142.61[b]±7.28)	60 (121.83 [b]±4.13)
During none fasting period	39 (133.97 [b]±2.85)	20 (165.5[c]±5.05)	59 (144.66 [c]±3.19)
During holidays and festivals	46 (144.04[c]±2.61)	22(172.73[c] ±4.32)	68 (153.32 [c]±2.77)
Total	126.19±1.70	126(149.5±2.93)	342(134.79±1.64)
Cheese sale price in kg by respondents			
During dry season	29 (43.45[c]±4.47)	7 (35[ab]±5.2)	36 (41.8[c] ±3.76)
During wet season	23 (29.57[a]±2.05)	8 (27.5[a]±4.2)	31 (29.03 [a]±1.85)
During fasting period	20 (31[ab]±1.76)	8(31.88[ab]±3.8)	28 (31.25 [ab]±1.62)
During none fasting period	23 (39.57[bc]±259)	8 (42.5[ab]±6.9)	31 (40.32 [bc]±2.57)
During holidays and festivals	25 (48.28[c]±3.6)	6(47.5[c]±6.29)	31 (48.13[c] ±3.12)
Total	120 (38.98±1.6)	37(36.35±2.55)	157(38.36±1.37)

LSM= least square means, SE= Standard error, N= Number of observations, Means within the same column, in the same milk product' with different super scripts letter are significantly different (p<.05)

Conclusion

According to respondents, the sale price of milk and milk products was not consistent across years it was varying due to the effect of season, holiday and festivals, fasting and no fasting condition in the study area. Most of the interviewed respondents sold their dairy through formal marketing (85.7%) who sold at marketing place. In the study area, of the dairy products only both butter and cheese were sold. About 41.9, 41.0, 14.3 and 2.9% of the respondents sold to their dairy products to consumers directly, directly to consumers and retailers, to retailers and cooperatives, respectively.

The results of the study showed that the price of the butter was influenced by selling of time and agro-ecology (location) which was 134.79±1.6 Birr/kg in average. The results indicated that the price of butter was significantly (P<0.05) vary across agro-ecology (location). In all selling time wet season, dry season, fasting, non fasting and holidays and festivals periods the marketing price of butter in lowland areas was more expensive than midland areas. The study was also indicated the butter marketing price was significantly different due to effect of selling time in the overall result as well as in each agro-ecology (low land and mid land). In similar manner, the marketing price of cheese was significantly differ cross influencing of selling time in both agro –ecology midland and low land and in overall result at 5% level of significant however, it was not significant vary across ecology.

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