

Assessment of Butter Marketing System and Supply Chain in Case of Damot Woyde Woreda, Southern Ethiopia

Amistu K[1] Afwork Z[2] Meshesha D[2]
1Animal and Range Sciences, College of Agriculture, Wolaita Sodo University, Ethiopia P.O.Box 138
2 Damot Woyde Woreda Office of Agriculture, Wolaita Zone, Southern Ethiopia

Abstract
The study was conducted at Damot woyde district, wolaita zone southern Ethiopia with the objective of assessing butter marketing and supply chain in the area. 132 butter producing and marketing households were purposively selected from the area. Besides different whole sellers, retailers and consumers were interviewed. Almost 100% of the respondent was involved in processing milk and marketing of butter. local cattle are the most dominant milking cows in kept by all three kebeles average butter production per month per head is in dega 100% of population obtained 1-5kg. w/dega 50% and kolla 40% and 5-10 kg optioned in dega 60% w/dega 30% and kolla 20% respectively. From the total producers 1-5 kegs obtaining are 63.3% and 5-10 kgs are 36.7% respectively. All respondents in three kebeles indicated the seasonality in butter price and yield 94% of retailers responded that butter from producers are not adulterated and 6% of retailers were respondent that adulterated 80% of the consumers were respondent that butter purchased from retailers and wholesalers are adulterated respectively. Besides, most important constraints in butter marketing along actors and that reduces the income of small holder farmers were poor access of transportation, adulteration, of retailers and wholesalers in chain. In addition to this consumer responded that 20-40 grams per kg of butter is adulterated purchased from retailers and whole sellers. The whole sellers loaded on every week from the woreda market to different towns of the country like Soddo, Shashamene, Hawassa, maximum 150-350 kgs and minimum 75-150 kgs per week. On average 45 wholesalers were loaded from woreda market. The major type of adulteration that reported by consumers were 67 and 33% of the consumers reported that butter they purchase is adulterated with banana and 'sheno lega' respectively in the area.
Keywords: butter, milk marketing, supply chain, Adultration, Damot woyde

Introduction

The contribution of livestock to annual agricultural output and gross domestic product in Ethiopia is 40% and 50% respectively (FAO, 1995). Ethiopia has the largest livestock population in Africa. According to, livestock population was estimated at 52,130,000 cattle, 14,655,556 sheep, 13,661,562 goats, 1,504,208 horses, 3,962,968 donkey, 354, 122 mule and 42,915,629 poultry (CSA, 2012).

Livestock provides rural and urban population with milk, meat, employment investment opportunities and draught power as well as several useful products (Demeke and Kumsa, 1998). Milk and milk products such as butter, cheese and other fermented milk are among the main livestock products produced in the country and have significant contribution to the family nutrition. Dairy processing methods are traditional and the efficiency is sub optimal. For instance, to make butter sour milk or cream is agitated vigorously at a temperature in which the milk fat is partially solid and partially liquid. Small holder milk processing is based on fermented milk. This is mainly due to high ambient temperatures, low level of daily milk production, consumer preference, the butter keeping quality of fermented as well as the type and capacity of locally available processing materials and methods (O. Conor, 1993).

Cattle milk makes up about 960,000 metric tons annually, and substantial part of the milk yield is converted or processed to butter and cheese (Azage and Alemu. 1998). Intensive system such as state enterprise and small and large private farms use exotic breeds and their cross; which have the potential to produce 1120 – 2500 liters over 279 days account for 83.4% of the total annual milk output (FAO, 1993). Milk productions from exotic and cross animals are significant but it is growing remarkably (Staal and Shapiro, 1996). Unless milk and milk products find a market outlet, they are retained for household consumption and the level of production kept low (Fekadu, 1994).

Most of the milk produced in the country is processed by the producers themselves on farm in the butter and soft cheese or "Aybe" form home consumption and sell. Rural process for a way term urban market usually process surpass milk in to butter because of difficulties in selling fresh milk locally and the main butter markets are in the towns and cities (CSA, 2003). Apart for income consumers preference and dietary customs also partly explain relative low demand for dairy products. Orthodox Christians comprising about 40% of the Ethiopian population abstain from consuming dairy and other animal products for about 200 days in year. Thus, low demand for dairy products in Ethiopia compared to demand in other low income countries in sub Saharan Africa appears to be a major reason for the slow growth of the dairy sector. Butter and some dairy products are called yellow fats which contains a number of products for spreading on to bread or for indirect consumption as

ingredients in other foods(Embaye , 2010).

Milk process is not well developed in Ethiopia (Azage et.al. 2001). Throughout the world and particularly in countries with a developing dairy industry, the milk of several mammals is processed by traditional methods in to various products for immediate consumption or for latter during times of reduced milk production (O. Conor, 1993). As the result local processors, if any exist are constrained to take milk in excess of processing ability (Falbery and Chanaltalkhana, 1999). In many countries their exist several traditional milk products whose processing techniques and technologies are passed to generation to generation through demonstration and experience: however, most of these products have comparatively short shelf life and loss of valuable milk nutrients often occurs particularly during periods of high milk production. The small quantity of milk produced by majority of the rural households is the traditional system and usually processed in to butter and cottage cheese by the household and sold to trader or other consumers and local markets (Halloway *et al*. 2000).

Moreover, prevention of microbial contamination of milk requires follow up animal health status such as sanitizing udders and rear quarters of the cow, cleaning milk contact surface and equipment, sanitary milk production by milk handling personnel and avoiding excessive environmental contamination. In Ethiopia much of the traditional handling and management of milk and milk products in rural areas are undertaken by women. Women farmers or adult female in the family commonly process sour milk in to varsities of products such as, butter, butter milk and cottage cheese. Butter contributes to households for earning income by selling it and has high consumptive value to get energy in the form of fat. However, Milk process is not well developed in Ethiopia (Azage *et.al.* 2001). Throughout the world and particularly in countries with a developing dairy industry, the milk of several mammals is processed by traditional methods in to various products for immediate consumption or for latter during times of reduced milk production (O. Conor, 1993).

From food security point of view this products are more important to the rural population than to the urban population because in urban areas there varies alternatives income source other than dairy product processing. Women in Ethiopia have traditional skills of milk containers, handling, maintaining of the quality of milk and milk products marketing income from sale of dairy products in mainly controlled and managed by women for the family welfare. In an attempt to improve product quality and shelf life, women wash and smoke milkingcontainers with different tree plants, such as Achynthes aspera (local name “Guluwa”), Ruta garvelones (local name “talotiya”), Ruta cymbo pogon (local name “shasha”). Then they rub milk vessels with herbs of desirable aroma, the type of which can vary from place to place (Alganesh, 2002). Women farmers in the area commonly process sour milk in to butter, cheese and butter milk to overcome the problem of food shortage in the family. However, production materials and techniques are traditional and innovative methods are limited.

As the result local processors, if any exist are constrained to take milk in excess of processing ability (Falbery and Chanaltalkhana, 1999). The concrete reasons for conducting this research on butter supply chain in case of Damot Woyde Wereda is that the area is known for quality butter production but does not studied still due to inadequate information and limited linkage between producers and consumers. This assessment of the existing practice help to identify, fill the information gap and opportunities so as to introduce improvement of butter production, processing and marketing. Therefore, the aim of the present study is to assess the supply chain of the butter in the study area.

Methodology

Damot Woyde Wereda is located 26 Km from Wolaita Sodo town; the capital city of Wolaita zone. The Wereda is surrounded by Damot Gale Wereda from North, Humbo Wereda from South, Diguna Fango Wereda from East, and Sodo Zuria Wereda from West. The agroclimatic condition is 84% weynadega, 4% Dega, and 12% Kola. The temperature ranging between 18-28ºC and the altitude range is between 1200-200masl (DWWAD office, 2006). The livestock population of the Wereda is estimated at 81,972 cattle; among those milking cows are 26,186, 36,716 sheep, 38,313 goats, 416 mules, 7105 donkey and 174,614 chicken. There are 23 kebeles including town municipality in the woreda. The agriculture is the main source of income of the population in the woreda. As data of 2006 DWW population media center states, the total population living in the wereda is estimated to be 130,081of which males account 63,813 and female are 66,188. The total cultivated land is estimated to be 10,093 hectare out of which 6,577.1 hectare is cultivated through rain-fed while, 3513.1 hectare is through irrigation. From the irrigated land around 3,510.3 hectare was irrigated through surface irrigation system using the potential rivers called Bisare and Bedessa rivers and 2.8 hectare using privately owned water harvesting structures, which are found at different kebeles of Damot Woyde Woreda (DWWAD office, 2006).

Data type and sources

Both primary and secondary sources of information were used for the study. Primary data was collected from small holder butter producers, retailers, whole sellers and consumers. Secondary data sources were obtain from Woreda office of Agriculture, Cooperatives at different levels and different relevant un-published data in the study area. Then data was collected on production, marketing of butter, system of storage, transport facilities and

supporting institution and other actors in the supply chain from purposely selected respondents using semi-structured questionnaire. Besides to these, data on quantity and selling price of butter per household in Kg

Two stage sampling procedure was adopted to assess butter marketing and supply chain in the district. The first stage was stratified selection of rural kebeles(Tora Sadebo, Dawe Sake and Mayo Kote) in the study sites based on the agro ecological zones (i.e. Kola, Woynadega, and Dega)respectively. These criteria's are important to determine the butter production and marketing characteristics of the Woreda. From each Kebele 44 households and a total of 132 households (producers) was used for the study. Besides, 6 butter merchants or retailers were selected from each route and a total of 18 merchants were used for determining the supply chain and also 6 whole sellers and 6 consumers were selected from three Kebeles which makes the total numbers of 132 sample households from three Kebeles and directly from market.

Data analysis

Collected data was summarized and analyzed by using descriptive statistics such as mean, percentage and reported by using table, charts and graph. Simple descriptive statistics will be employed for analysis of survey result. The obtained data will be subjected to statistical analysis and the average, compared by Microsoft Excel statistical and calculated using SPSS version 17 software.

Result and discussion

As indicated in table 1 above, majority of the respondents were females in the study area. This implies that butter marketing in the area in mainly conducted by females in the study area. In addition to this, majority of the respondents 88.3% in the study area were in the age range of 31-35years. However, majority of the respondents were educated not more than 5-8(75%). Others were at certificate and diploma level (13.3%) and (11.7%) respectively. Finally, majority of the respondents in the study area were Protestants (78.3%) and the remaining (21.7%) were Orthodox Christianity followers.

Table 1: Socio-demographic characteristics of the respondents

No	*Item*	*Parameters (alternative)*	*No of respondents(30)*	*%*
	Sex	Male	13	15
		Female	119	85
	Age	26-30	28	8.3
		31-35	89	88.3
		36-40	15	3.4
		41-50	-	-
		51-60	-	-
		60 and above	-	-
	Education	illiterate	-	
		5-8	75	75
		Certificate	26	13.3
		Diploma	31	11.7
	Religious	Protestant	87	65.9
		Orthodox	32	24.2
		Muslim	13	9.8
		Other	-	

Breeds of milking cows

About 83%of the respondents in the area posses local milking cows where as the remaining17% of them were posses cross breed in the study area. This implies that majority of both milk and butter in the study area comes from our indigenous animals and they acts as source of income for the community in the area.

Table2: *Breeds of milking cows*

No.	*breeds*	*N*	*%*
1	Local	98	74.2
2	cross	34	25.8
3	exotic	-	-

Feed resources in the areas for dairy animals

The present assessment revealed that the available feed resource in the study area is natural grazing (38%),crop residue leaves (24%), hay (24%) local brewery by products (Atela) (14%),legumes and grains (cotton seed, haricot bean, grains, root crops and leaves) during dry season.

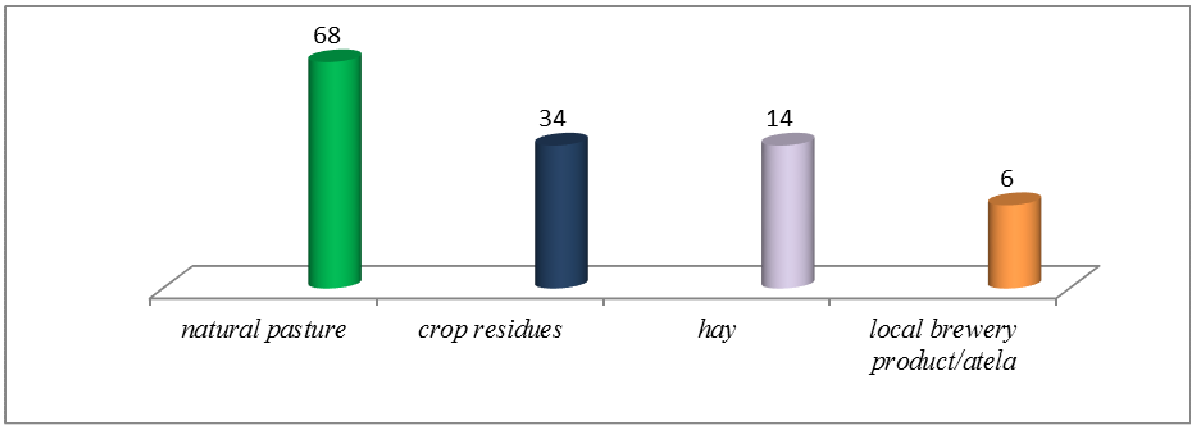

Fig1. Major feed resources in the area

Table3: *Cattle population and breeds used in the area*

Parameters		dega		w/dega			kolla	overall	
		N	%	n	%	n	%	n	%
Cattle population mean per HH per kebele	oxen	4	10.8	5	15.2	8	17.4	17	14.7
	cow	13	35.2	11	33.3	16	34.8	40	34.5
	Steer	2	5.4	4	12.1	6	13	12	10.3
	Heifer	7	18.9	3	9.1	4	8.7	14	12.1
	calves	11	29.7	10	30.3	12	26.1	33	28.4
Breed type of milking cows	Local	10	100	20	50	35	28.5	65	83.3
	Cross	4	40	2	20	3	30	8	16.7

Butter production in the area

As indicated by producer respondents, from the total respondents amount of butter produced /HHs in monthly were 1-5 kg and 5-10 kg (37%) and 63%of the respondents respectively. Of the butter producers reported that they store 2 weeks,1-12 months (33.3%)and 1-5 years (26.7%) before selling.

Butter marketing by producers

Marketing is the most important factor that affects the overall availability of product as well as their distribution to the consumers. As indicated by producers in the study area butter price by producers were varies from 110-140ETB during wet season and 120-160 during dry season. This implies that seasons have effect on butter availability and it's marketing in the area.

According to the assessment of butter supply chain analysis it was seen that the butter supply was increased especially during wet season of a year and decreasing trend in dry season. On the other hand during fasting and public holidays butter supply and selling price were high. Among the interviewed respondents reported that all have milking cows. Further the producers explained that the milk obtained from the local breeds is considered as best for butter production due to its high fat content.

Butter supply and marketing system by retailers

About 56.6 % of the retailers reported that there have been trading butter for more than 10 years and about 43.4% had butter trading experience of 3-10 years. In line with this adulteration of butter with different foreign materials were reported by the few retailers (6%) from producer level, 94% of the retailers reported that they used to evaluate butter by painting on the body.

Methods of assessing butter quality in the areas

Butter quality is linked with method of handling butter, addition of foreign materials and other environmental factors. About 22.2%, 11%and 66.7% of respondents stated that they determine quality of butter by smelling, filtering and painting respectively in the study area.

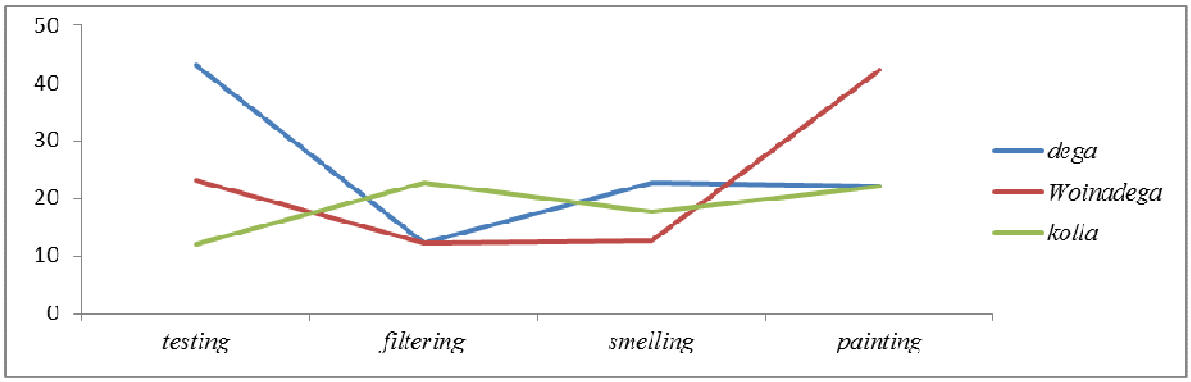

Fig2. Methods of butter quality determination by retailers in the areas

Butter marketing pattern and experience of whole sellers

As the result shown 3 wholesalers have rich experience in trading butter for the last 16-30 years and rest (3) have 3-15 years. Through this year they assemble butter 20% from producers and 80% from the retailers. They purchase the same kg of butter from producers and retailers in various prices. The variation is due to quality difference. They purchase a kg of butter in different seasons 130-160 birr from producers and 140-180 birr from retailers. The reason behind is quality difference. During this time they collect and load to soddo, shashamene and Hawassa. In wet season they load 150-320 kgs in weeks and in dry season 40-140 kgs in every week. Most of the time they faced with butter quality adulteration or deterioration problem from retailers butter. That is why they purchased in fewer prices from the market. Present assessment showed that the wholesalers transport minimum of 75-150 kgs and maximum of 150-350 kgs in dry and wet season respectively to Soddo,Hawassa Shashemene.

Table 4: *Butter marketing pattern and experience of whole sellers in the area*

Parameters		***number***	***%***
Experience in butter trading	3-15 years	3	50
	15-30	3	50
Butter assembled source	Producers	2	20
	Retailers	4	50
A kg of butter buying price in birr producers & retailers	Producers,130-160	-	-
	Retailers,140-180	6	100
A kg of butter selling price in birr	140-170	2	20
	150-190	4	80
Butter collect on every week in kgs	150-320	3	50
	40-140	3	50
Challenges in line with butter adulteration	Yes	4	80
	No\	2	20
Supply of butter increase	June-November	3	50
	September-may	1	16.7
Supply of butter decrease	December-may	4	80
	September-may	2	20
No of wholesalers collecting butter from this market on every w.s	10-30	3	50
	30-60	3	50
Amount of butter in kg loaded from this market on every weekly by w.s	75-150	2	20
	150-350	4	80
Local butter quality testing method	Painting	4	80
	Observing	2	20

Butter marketing by retailers in the area

Retailers reported that they sell 145-170 ETB/kg of butter to wholesalers and 155-170 ETB to consumers. The retailers purchase butter in every Monday and they buy a minimum of 5-27 kg and maximum 28-200 Kg of butter from producers with seasonal variability because of feed shortage in dry season that hinder production of butter. This finding is in line with Gebremedhin *et al.,* 2014 who stated the average price for butter as 112.5 birr/kg. The average price of a kg of butter during wet season was 110-140 ETB (77.8%) and 120-160 ETB (22.2%) during dry season.

Table4: *Retailer's Butter supply and Marketing in the area*

Parameters		Kebele							
	Parameter	*Dega*		*w/dwga*		*kolla*		*overall*	
		n	%	n	%	n	%	n	%
Experience in butter trading	> 10 years	5	83.3	3	50%	2	33.3	10	55.6
	< 10 years	1	16.4	3	50%	4	66.7	8	44.4
Problem faced in line with butter adulteration	Yes	-	-	1	16.4%	-	-	1	16.6
	No	6	100	5	83.3	6	100	17	94.4
Purchase price /kg	Max.	160	-	150	-	140	-	-	-
	Min.	120	-	130	-	110	-	-	-
	Av.	140	-	140	-	125	-	-	-
Selling price, ETB /Kg	Max.	170	-	170	-	160	-	-	-
	Min.	140	-	140	-	130	-	-	-
	Av.	155	-	155	-	145	-	-	-
Butter purchased per week in kg	5-27	4	66.7	4	66.7	5	83.3	13	72.2
	28-200	2	33.3	2	33.3	1	16.4	5	27.8

ETB=Ethiopian birr

Butter consumers in the area

As the study result showed that they consume minimum of 1-2 kg and maximum 3-4 kg of butter on every months.16.7% of the consumers purchase butter from producers.33.% from whole sellers and 50% from retailers . 66.7% of the population faced with quality problem and 33.3% of the population were not faced the quality problem. They informed that 20-40 grams of adulteration from retailers purchased butter during filtrating a kg of butter. Because of this they accuse or complain retailers and wholesalers seriously and they forward an idea that all the stakeholders should fight the doers of butter quality adulteration or deterioration.

Table 5: *Pattern marketing and seasonal variation of butter by consumers in the area*

Parameters	***Item***	***No of respondents***	***percentage***
Purchase per month	Yes	6	100%
	No	-	-
Amount in kg/month	1-2	4	80
	2-4	2	20
Purchase from	Producer	1	16.7
	Retailer	3	50
	Wholesaler	2	33.3
	No	2	20
Supply increase	April-august	6	100
Supply decrease	Oct-may	5	83.3
	Dec-may	1	16.7
Price increase	Sep,dec,april	5	83.3
	Jan,Feb,march	1	16.7
Price decrease	Wet season	6	100

About 80% of the respondent consumers were stated that butter in the market for consumption is adulterated. However, almost all of the respondents stated that high level of adulteration occurs at retailer level. The major type of adulteration that reported by consumers were 4(67%) and 2(33%) of the consumers reported that butter they purchase is adulterated with banana and '*sheno lega'* respectively in the area.

Table6: *Methods of butter quality detection by consumers*

Parameters	*Item*	*No of respondents*	*percentage*
Adulteration problem	Yes	4	80
	No	2	20
Adulteration estimated in gm	20-40 gm	5	83.3
	15 gm	1	16.7
Local butter quality determination method	filtering	6	100
	Smelling	-	-
more Adulterated	Producer	-	100
	Retailer	6	100
	wholesaler	-	-

There were various factors that affect butter quality in the areas were identified during the study. Addition of foreign material is related with reduction of quality of butter in the study area. About 80 % of the

respondents were stated that majority of butter available in the market was adulterated that was sorted by different traditional mechanisms like smelling, painting etc in the area.

Conclusion

Almost 100% of the respondents were involved in processing milk and marketing of butter. local cattle are the most dominant milking cows in kept by all three kebeles average butter production per month per head is in dega 100% of population obtained 1-5kg. w/dega 50% and kolla 40% and 5-10 kg optioned in dega 60% w/dega 30% and kolla 20% respectively. From the total producers 1-5 kegs obtaining are 63.3% and 5-10 kgs are 36.7% respectively. All respondents in three kebeles indicated the seasonality in butter price and yield 94% of retailers responded that butter from producers are not adulterated and 6% of retailers were respondent that adulterated 80% of the consumers were respondent that butter purchased from retailers and wholesalers are adulterated respectively. As our result shows that the most important constraints in butter marketing chain analysis is that reduces the income of small holder farmers were poor aces of transportation, adulteration, of retailers and wholesalers in chain. In addition to this consumer responded that 20-40 grams per kg of butter is adulterated purchased from retailers and whole sellers. The whole sellers loaded on every week from the woreda market to different towns of the country like Soddo, Shashamene, Hawassa, maximum 150-350 kgs and minimum 75-150 kgs per week. On average 45 wholesalers were loaded from woreda market.

The major type of adulteration that reported by consumers were (67%) and (33%) of the consumers reported that butter they purchase is adulterated with banana and '*sheno lega'* respectively in the area.

Recommendation

Dairy producers and butter cooperative should be established by relevant bodies in the area that helps for the development of formal butter and milk marketing and enhancing quality of the product. All butter traders should be licensed and trained by the stakeholders to reduce the problems related to butter quality in the market. Research and adoption technologies should be aggressively investigated and research should be conducted on the butter supply chain actors, quality assurance bodies should be established in woreda. Attention should be given to reduce constraints through training and active participation in planning and implementation of the dairy and butter marketing development projects and at alleviating food security problem in the study area.

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