RESEARCH ARTICLE

Milk market structure-conduct and performance: The case of selected districts of East and West Gojjam zones of Amhara regional state, Ethiopia

Desalegn Wondim[1*], Mezgebu Aynalem[2], Ayalew Fekadie[3]

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Even though number of cattle population in different parts of Ethiopia and smallholders economic dependency on their animals contradict for long period of times, recently dairying becomes an important farming activity in Amanuel and Dembecha districts. Even if these two districts are potential in milk production and marketing activities, scanty of information faced regarding milk marketing channels, actors and the general market structure, conduct and performance of milk in Machakel and Dembecha districts. Thus, this study attempts to assess the structure, conduct and performance of milk marketing in the study areas. Data were collected both from primary and secondary sources by using appropriate tools. Primary data were collected from 244 milk producers and 50 milk traders from both districts by using semi-structured set of questions. Moreover, FGD, key informant interview and direct observation was used to strengthen the collected data from primary respondents. Finally, the S-C-P paradigm showed that there was imperfect market competition between milk traders and TGMM was highest in channel II (50.62%) and lowest in channel I (28%) without considering marketing channel V that producers take all portions of consumers' price. Producers' share was the highest in marketing channel I (72%) that milk producers sell to milk cooperatives in a better price than exploited by other intermediaries. Whereas producers' gross marketing margin was lowest in marketing channel II (49.38%) that in this channel hotels added customer considerable value to milk and take high portion of the consumers' price. Thus, both Woreda office of agriculture should integrate production extension service with milk marketing, milk cooperative benefits and income generation ability of the business by calling and inviting model milk producers in FTC and other discussion meetings.

Keywords: Milk; S-C-P; Marketing channel; Marketing margin

INTRODUCTION

In the continent of Africa, Ethiopia is the first top ranked country for its largest livestock population. Livestock sector in Ethiopia serves as source of income, draft power and means of employment with an economic contribution share of about 40% of agricultural GDP excluding the values of draught power, manure and transport of people and products and cattle, goats and camel are the main sources of dairy products in Ethiopia. With regarding to the sector economic contribution and job opportunity in Ethiopia, Mihret et al., explained that in the year 2010, dairying created an estimated of 588, 000 full-time on-farm jobs and smallholder farmers represent about 85% of the population and are responsible for 98% of the milk production.

According to Gebre Wold et al., on the bases of production intensity, market orientation and scale of production in general dairy production can be categorized as traditional smallholders *i.e.* this sector producers 97% of the total national milk production coverage and 75% of commercial milk production and this sector is largely depend on indigenous breeds that mainly characterized by low milk productivity native zebu cattle that produces about 400-680 kg of milk per cow per lactation period [1]. Whereas privatized state farms are those with more than 87.5% exotic breeds and are mainly found within 100 km away the capital of Ethiopia, Addis Ababa. Peri-urban and urban systems of dairy production sector is commercial and mainly based on the use of crossbred animals that have the potential to produce 1120-2500 liters over a 279 days lactation period. This production system is now expanding in the highlands among mixed crop-livestock farmers and serves as the major milk supplier to the urban market.

Based on CSA estimated data, the country produced 2765, 2940 and 4,058, million liters of cow milk in 2008/09, 2009/10 and 2010/11 respectively. Even though it indicated increasing progress, milk production per cow per year is low in Ethiopia as compared to the neighboring countries. For instance, Ngigi reported that, the average milk production per cow per annum was 507 in Kenya in 1998 while it was about 350 liters in Uganda and 209 in Ethiopia in the same year [2].

Regarding consumption the national expenditure on livestock products is computed to be about 4.7 billion Ethiopian Birr with a mean annual per capita expenditure of 90.07 ETB. Oromia takes the lion's share in the total national expenditure on livestock products, *i.e.* 44.5 percent, while the Southern peoples region and Amhara take the second and the third place; with 20 percent and 17 percent of the total national expenditure share of livestock consumption, respectively (Figure 1).

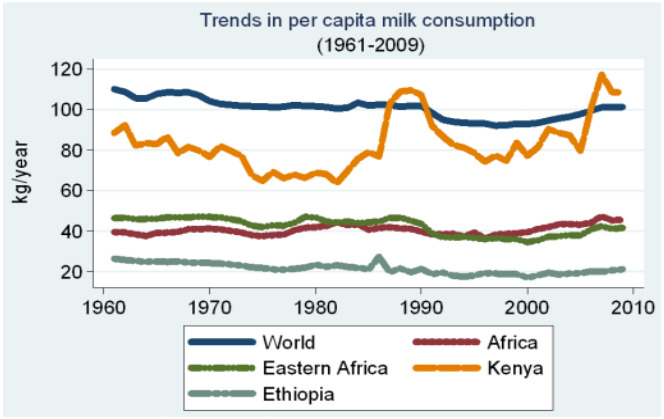

Figure 1: International dairy consumption

[1]*Department of Agribusiness and Value Chain Management, Debre Markos University, Amhara Region, Ethiopia*

[2]*Department of Agricultural Economics, Debre Markos University, Amhara Region, Ethiopia*

[3]*Department of Animal Production, Debre Markos University, Amhara Region, Ethiopia*

Correspondence: *Desalegn Wondim, Department of Agribusiness and Value Chain Management, Debre Markos University, Amhara Region, Ethiopia; E-mail: desalegnwondim@yahoo.com*

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Overall, Ethiopia has a complex dairy value chain, with both formal and informal channels. Milk and milk products are marketed through both informal and formal marketing systems. In the dominant informal marketing system, producers sell to consumers directly or to unlicensed traders or retailers [3]. The major dairy products commonly marketed are fresh milk; butter, ergo, cottage cheese (ayib), and buttermilk. Marketing of milk and milk products varies depending up on the source of the milk, access to market, culture of the society, season and fasting period.

In general, consumption pattern and marketing of dairy products produced at home varied depending upon the amount of milk produced per household, dairy production system, market access, and season of the year, fasting period, and culture of the society. Rural dairy farmers have very little access to market fluid milk and milk is often processed into butter. The major dairy products commonly marketed include fresh milk, butter, ergo (fermented whole milk), cottage cheese and butter milk.

According to Dereje et al., dairying is practiced almost all over Ethiopia involving a vast number of small or medium or large-sized, subsistence or market-oriented farms [4]. Based on climate, land holdings and integration with crop production as criterion, dairy production systems are recognized in Ethiopia; namely the rural dairy system which is part of the subsistence farming system and includes pastoralists, agro-pastoralists, and mixed crop-livestock producers; the peri-urban; and urban dairy systems.

But even though Ethiopia has about 52 million head of cattle, and high potential in milk production and consumption which can alleviate food security problems of the nation, the dairy sector remains incapable of meeting local demand that the country is losing high amounts of money for imports of dairy products. The capital city of Ethiopia, Addis Ababa, about 8% of the dairy products consumption was from import. The country import of milk and milk products was showing dramatic increasing trend and within five years Ethiopia's value of imported milk and milk products rocketed by 142% rising from birr 48,951,297 in 2005 to 118,559,962 in 2010, furthermore, recent evidences showed that Ethiopia has a net importer of milk products with an import bill rising from U.S. dollar 5.6 million in 2005 to 7.6 million in 2014 and consumer demand for improved dairy products is still quite limited. According to ANRS, in Ethiopia, the Amhara national regional state contributed 22% of the national milk production and almost all of the milk produced comes from small holder dairy cattle producers [5]. The most notable milk producing areas in the region are South Gonder, Awi, North Shewa and East and West Gojjam zones of the region. In East Gojjam zone of Amhara region, dairy products value addition practices, the handling, and processing practice of milk and milk products are in a traditional system and milk and milk products marketing is very limited.

But in the study areas both district smallholder farmers are currently shifting from mixed crop-livestock farming to intensive milk production following urban expansion. In the study area, urban expansion leads to high feed deficit that opens an opportunity for local alcohol makers. Especially local alcohol, locally known as Areki maker females are mainly engaged in milk production that the by-product of the alcohol used as the main feed for milking cows. Moreover, graduated and college educated youth are spreading on the business too that needs producing milk by selling it. However, to boost the sector more and able to open better job opportunity in the study areas empirical study did not conducted and documented for further investigation and policy implication. Market structure, conduct and performance analysis along the product marketing channel tells about the efficiency of the market. In this paradigm, market structure *i.e.* the firms' integration and capacity of controlling the market affects market conduct in turn market conduct affects market performance. Thus, this study overcome milk market structure, conduct and performance blurred in the study districts.

MATERIALS AND METHODS

Description of the study areas

The research was conducted in selected districts of West and East Gojjam zones, Machakel and Dembecha in Amhara region, Ethiopia. Machakel is one of the Woredas in East Gojjam zone of Amhara region, Ethiopia. It is bordered on the South by Debre Elias, on the northwest by West Gojjam zone, partly by Dembecha district, on the East by Sinan, and on the southeast by Guzman. On the other hand Dembecha is currently one of the fourteen woredas in West Gojjam zone of the Amhara region of Ethiopia; it is located at 348 km North West of Addis Ababa, the capital of the country and 205 km East from Bahir Dar city of the region. Dembecha is bordered on the West by Burie Woreda, on the North by Dega Damot, and on the East and South by East Gojjam zone. Towns in the district include Dembecha, Wad, Enewond and Yezeleka. Regarding its topographical structure 60% of the woreda is plane whereas 6% and 34% are valley and hill respectively (Source: Dembecha Woreda Office of Agriculture). Both districts have suitable agro ecological condition for livestock production, especially for dairying practices (Figure 2).

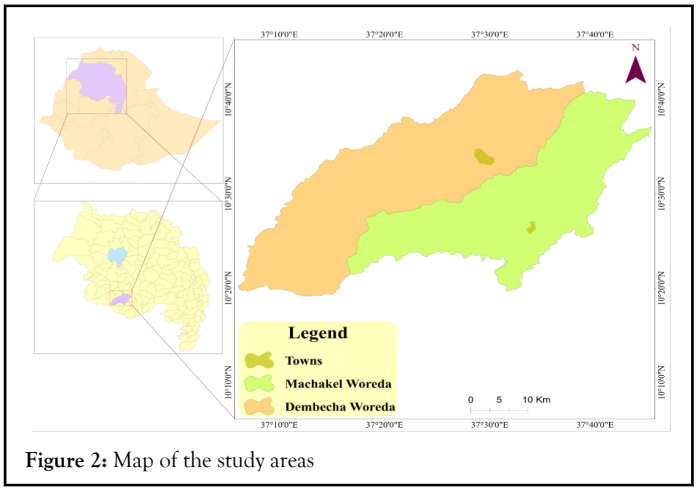

Figure 2: Map of the study areas

Data sources, types and method of data collection

In this study both quantitative and qualitative data were collected from primary and secondary data sources. The primary data were collected from milk producers, milk cooperatives, traders and consumers using pre-tested semi-structured schedule. Secondary data were collected from records kept by office of agriculture in the Woredas and cooperative milk collection units, trade and industry development office and other literatures regarding dairy production, marketing and market actor's synergy in the study areas. The schedule was designed to collect data that can answer the research questions and data enumerators were aware clearly about the objective of the study [6]. Focus Group Discussion (FGD) with milk producers in each Kebeles of both districts and key informant interview from office of agriculture and primary milk cooperatives members and chair persons were held.

Sampling procedure and sample size

A two stage sampling procedure was used to select sample milk producer households. Firstly, Dembecha and Machakel districts were selected purposively based on their actual milk production and potential from their respective zones data. Secondly, from Dembecha district after consulting with district offices of agriculture animal science department, out of 29 Kebeles 2 Kebeles were selected purposively based on their milk production potential, participation and the field extension contact cover per year. Whereas in Machakel district there are a total of 25 kebeles of which five kebeles are known in their milk production potential. From potential milk producer Kebeles three Kebeles were selected randomly [7]. Lastly, sample milk producers were selected using simple random sampling from each sample Kebeles based on probability proportional to size to each sample Kebele milk producers in both districts.

Household heads were the sampling unit and using Probability Proportional to Size (PPS) the numbers of respondents were selected from each sample Kebele sampling frame using simple random sampling

technique. Total sample size of households were determined using sampling formula at 95% confidence level and thus, the total sample dairy producers were 244 for both woredas.

$n=N/1=N(e)^2$ (1)

$n=18000/1+18000(0.09)^2$ approx., 123 producers

Where;

n=Sample size used for this research in Machakel woreda (122)

N=The total dairy producer households in Machakel woreda (18000)

e=Margin of error (0.09)

Whereas in Dembecha woreda the estimated number of dairy producers are (16500)

$n=N/1=N(e)^2$

n=16,500/1+16,500 approx., 121 producers

Where;

n=Sample size used for this research in Dembecha woreda (121)

N=The total dairy producer households in Dembecha woreda (16,500)

e=Margin of error (0.09)

Regarding sample traders, according to Mendoza in value chain and marketing study where numbers of actors involved, researchers do not agree on sample size that should be used at each node of the value chain and the decision involved are partly a function of the information currently known, time and resources available, accessibility to and openness of the marketing participants themselves as well as the estimated size of the trading population.

Depending on this concept, researchers want to know current status and number of milk traders from both districts. However, traders who participate in milk business in the study areas were not licensed on milk and milk products trade alone rather they had combined trade license with other foods and drinks in both districts and thus snowball sampling technique was found to be appropriate to get sample milk and milk products traders [5]. And thus, Amanuel and Dembecha towns were the two main district towns at which more number of traders were found using snowball sampling technique.

Finally, Amanuel, Debre markos, Yewula, Embuli and Dembecha markets were markets at which milk traders were found and thus, a total of 50 traders were selected using snowball sampling technique from these markets. In order to crosscheck data collected from the traders' especially final price paid by consumers, consumer data was essential. Thus, 20 consumers were taken purposively at morning time milk users from Dembecha, Embuli and Amanuel milk cooperatives. Morning time is the peak time assumed for fresh milk users/consumers.

Method of data analysis

Market structure-market structure would be determined based on market concentration that exercised by milk and milk product traders and barriers to market entry for potential traders. Concentration is defined as the number and size of distribution of sellers and buyers in the market. The greater the degree of concentration, the greater is the possibility of noncompetitive behavior in the market [8]. For an efficient market, there should be sufficient number of buyers and sellers. Kohls and Uhl bring into play as rule of thumb, the four largest enterprises' concentration ratio of 50% or more (an indication of a strongly oligopolistic industry), 33-50% (a weak oligopoly) and less than that (competitive industry). Therefore concentration in the market will estimated using the common method of market concentration ratio, which refers to relative size and number of buyers in the market. The concentration ratio was calculated by the following formula.

Where;

$S_i=V_i/\Sigma V_i$

S_i=Market share of buyers i

V_i=Amount of product handled by buyer

ΣV_i=Total amount of product handled by buyers

$C=\Sigma^m_{i=1} S_i$

Where i=1, 2, 3... m

Where; c=Concentration ratio

S_i=Percentage share of the i^{th} firm

m=The number of largest firms for which the ratio is going to be collected.

Market conduct

Since market conduct is the patterns of behavior that firms following in adapting or adjusting to the market in which they buy or sell. This is the implications that are not readily identifiable, obtainable or quantifiable. Therefor market conduct was treated in a descriptive manner. Market conduct was determined based on pricing strategies and buying and selling practices by milk producers and traders.

Market performance

According to the study by Awad et al., analysis of marketing costs and margins would reveal how efficient pricing in domestic markets is, and gives an indication of the importance of transaction costs facing traders, farmers and intermediaries (middlemen) and help in identifying and solving bottleneck thus assist in reducing marketing costs along the product flow [9-12]. Analyzing total marketing margin is based on the price paid by the final destination of the product or the end buyer and expressed in percentage.

Finding the price variations at different segments and then comparing them with the final price to the consumer. Therefore, consumer price was considered as the base for all margin computation after collecting relevant data from value chain actors that was identified in value chain mapping in analysis [13]. Total Growth Marketing Margin (TGMM) was calculated first in order to compute Gross Marketing Margin (GMM) of different actors, Net Marketing Margin (NMM) and Total Marketing Cost (TMC) that help to investigate who get what amount?, who incur what amount, to see the product flow and helps to understand who is in a disadvantageous position which is useful for intervention for improvement.

TGMM=End buyer price-First seller price/End buyer price × 100

The first seller of the product is known, the milk producer and therefore, the i node or actor in the chain along the product flow GMM will be computed as;

GMMi=Selling price of i(spi)-Purchase price of i(ppi)/End buyer price × 100

Where i is the transaction node of the chain

Here producers share was calculated as, 1-TGMM or

Producers sh(ps)=Producer price/Retail price × 100

NMM= GMM-MC/End buyer price × 100

Where,

TGMM=Total Growth Marketing Margin

GMM=Growth Marketing Margin

NMM=Net Marketing Margin

MC=Marketing Cost

SPi=Selling price at i^{th} node and

PPi=Purchase price at i^{th} node

RESULTS AND DISCUSSION

Demographic and socioeconomic characteristics of respondents

The results shows in Tables 1 and 2.

TABLE 1
Sample household characteristics across districts (dummy variables)

Variable	Items	Dembecha (N=121)		Machakel (N=123)		Total (N=244)		χ^2 test
		N	%	N	%	N	%	
Sex	Male	108	89.3	117	95.1	225	92.2	2.92
	Female	13	10.7	6	4.9	19	7.8	
Religion	Orthodox	119	98.3	119	96.7	238	97.5	0.65
	Others	2	1.7	4	3.3	6	2.5	
Cooperative membership	Yes	35	28.9	77	62.6	112	45.9	27.86***
	No	86	71.1	46	37.4	132	54.1	
Access to market information	Yes	81	66.9	108	87.8	189	77.5	15.20***
	No	40	33.1	15	12.2	55	22.5	
Market access for milk	Yes	104	86	108	87.8	212	86.9	0.18
	No	17	14	15	12.2	32	13.1	
Credit access	Yes	109	90.1	101	82.1	210	86.1	3.23
	No	12	9.9	22	17.9	34	13.9	
Livestock extension	Yes	96	79.3	117	95.1	213	87.3	13.70***
	No	25	20.7	6	4.9	31	12.7	
Participation In value addition	Yes	87	71.9	103	83.7	190	77.9	4.96**
	No	34	28.1	20	16.3	54	22.1	

Note: *, ** and *** indicates statistically significance at 10%, 5% and 1% level of significance respectively.

TABLE 2
Mean comparison test of sample households across the study districts

Variables	Dembecha (N=121)		Machakel (N=121)		Total (N=224)		t-value
	Mean	SD	Mean	SD	Mean	SD	
Age of HHH	43.2	9.3	46.1	9.6	44.64	9.53	2.42
Year of schooling	3.51	3.11	3.71	3.21	3.61	3.16	0.11
Number of children less than six years age	0.94	0.66	0.92	0.78	0.93	0.72	-0.25
Distance to the nearest market center in Km	2.79	1.25	3	1.29	2.9	1.27	1.28
Number of cross breed cows	0.64	0.52	0.67	0.73	0.65	0.63	-0.39
Total volume of milk per liter per day	5.02	1.18	5.12	3.25	5.06	2.44	-1.01
Non-dairy income in ETB	21800	16189	23956	13514	22886	14909	1.85**
Volume of milk value added per day	2.21	2.02	1.91	1.89	2.05	1.95	0.27**

Note: ***, ** and *statistically significant at 1%, 5% and 10% significance level.

Demographic and socioeconomic characteristics of traders

The results show in Tables 3 and 4.

TABLE 3

Demographic characteristics of traders

Demographic and socioeconomic variables		Name of the market where traders undertake their activity					
		Amanuel	Dembecha	D/mrkos	Kidamin	F/selam	Yewula
Sex	Male	14 (45)	5 (16.1)	5 (16.1)	4 (12.9)	4 (12.9)	0
	Female	6 (31.6)	10 (52.6)	0	1 (5.3)	0	2 (10.5)
Marital status	Single	1 (2)	3 (6)	0	0	0	1 (2)
	Married	18 (36)	11 (22)	5 (10)	4 (8)	3 (6)	1 (2)
	Divorced	1 (2)	1 (2)	0	1 (2)	0	0
Religion	Orthodox	20 (40)	15 (30)	5 (10)	4 (8)	4 (8)	2 (4)
	Muslim	0	0	0	0	0	0
Business category	Hotel	3 (25)	1 (8.3)	5 (41.7)	0	3 (25)	0
	Cafe	5 (45.5)	5 (45.5)	0	0	1 (9)	0
	Small milk house	12 (44.4)	9 (33.3)	0	4 (14.8)	0	2 (7.4)

TABLE 4

Socioeconomic characteristics of traders

Demograhic and socio-economic variables		Amanuel	Dembecha	D/Markos	Kidamin	F/selam	Yewula
Age	Mean	36	36	45	40	42	30
	SD	6	4.99	4.55	6.35	8.5	1.4
Family size	Mean	4	3	5	4.6	5	1.5
	SD	1.4	0.8	1.6	1.1	1	0.7
Experience	Mean	2.2	2.8	4	2	2.7	1
	SD	0.8	1.1	1.2	0.7	0.6	0
Distance to the market	Mean	1.6	0.93	30	1	55	0.5
	SD	0.68	0.62	0	0.35	0	0
Initial capital	Mean	3325	4066.7	11000	3100	26667	1900
	SD	847	1860	2000	1432	2887	1555
Current capital	Mean	6450	7800	19400	7400	37000	3750
	SD	1791	2513	1342	3286	2646	3182

Milk marketing channels

Marketing channel is the sequence of intermediaries through which whole products passes from the point of producers to the point of end users. According to Yilma et al., in Ethiopia, market channels of milk and milk products vary based on production system and type of value added milk products across areas. Milk and milk products in Ethiopia are channeled to consumers through both formal and informal marketing systems. In the study area four major marketing channels were identified that moved milk from farmers (producers) to the ultimate consumers [14]. In the study areas, basically fluid milk was passed through five marketing channels that from milk producers to cooperatives, hotels, small milk houses(road side shads), small collectors and ultimate consumers. Another dairy product produced for the market is butter and mainly common in the first marketing channels that directly from producers to consumers and from milk cooperatives to retailers to end users. However, butter traders in the study areas were small and seasonal thus cooperatives mainly send to Addis Ababa and Natheriate/Adama. There are also restaurants or cafes having better potential than road side shads that mainly resembles hotels but only names retail milk to consumers by purchasing from milk cooperatives or producers. As explained by milk cooperatives especially Amanuel milk cooperative has market linkage with Addis Ababa and Natherat.

In the study areas sample producers were produced a total of 1235.25 litters of milk per day during the survey period of which only 50.37% were supplied to the market.

Channel 1: Milk producers' → milk cooperatives → Consumers (22.82%)

Channel 2: Milk producers' → milk cooperatives → Hotels/c → Consumers (28.8%)

Channel 3: Milk producers' → small milk houses →Consumers (17%)

Channel 4: Milk producers' → milk cooperatives → small milk houses → consumers 27.32%

Channel 5: Milk producers' → Consumers (4.05%)

Milk market Structure Conduct and Performance(S-C-P approach)

Market structure conduct and performance is an organizational approach that deals with numbers of traders concentrated, their behavior and associated benefits to meet their predetermined goals in their business activities.

Marketing structure

Dairy producers, dairy cooperatives, hotels and restaurants and small milk houses/milk sheds were the main actors involved in the study areas. In discussing market structure, market concentration is one of the major factors that need to be indicated in those particular business scenarios [15]. Market concentration, degree of market transparency, Barriers to entry into the business activities, legal, price setting strategies and policy issues, were among the factors considered under this subtopic.

Market concentration ratio

Market concentration refers to the number and relative size of buyers or sellers in a market. Scholars indicated that for an efficient market, there should be sufficient number of firms (buyers and sellers). Firms of appropriate size are needed to fully capture economies of size; there should be no barriers to entry into, exit from markets, and should have full market information. Considering this marketing concept, degree of market concentration ratio Kohls and Uhl explained using numerical figures. Kohls and Uhl bring into play as a rule of thumb, four largest enterprises or firms "concentration ratio of 50% or more (an indication of a strongly oligopolistic industry), 33-50% (a weak oligopoly) and less than 33% (competitive or non-concentrated industry). The greater the degree of concentration is the greater the possibility of non-competitive behavior existing in the market. There are different methods to measure market concentration/structure. These are CR, HHI and Gini coefficient. In analyzing market concentration researchers mainly used concentration ratio for its number of firms' consideration and the common method of measure of concentration ratio. Thus this study was used market concentration ratio to analysis fluid milk market structure in the study area [16]. As indicated in Table 5 survey result revealed that the market was a weak oligopoly market type which means as the ratio result indicated there was imperfect market competition between milk traders. This study was supported by investigations on the same product but at different places in Ethiopia.

TABLE 5

Concentration ratio of milk buyers

No. of traders (A)	Cumulative frequency of traders (B)	% of trader (D=A/50)	Cumulative % of traders (E)	Quantity purchased per liter per day (F)	Total quantity purchased in liter (G)=A*F	% share of purchase S_i=G/522	% cumulative $C=\Sigma S_i$ i=1
2	2	4	4	18	36	6.9	6.9
2	4	4	8	18	36	6.9	13.8
1	5	2	10	16	16	3.06	16.86
8	13	16	26	15	120	23	39.86
2	15	4	30	14	28	5.36	45.22
1	16	2	32	13	13	2.5	47.72
5	21	10	42	12	60	11.5	59.22
2	23	4	46	11	22	4.21	63.43
2	25	4	50	10	20	3.83	67.26
3	28	6	56	9	27	5.17	72.43
6	34	12	68	8	48	9.2	81.63
5	39	10	78	7	35	6.7	88.33
8	47	16	94	6	48	9.19	97.52
1	48	2	96	5	5	0.96	98.48
2	50	4	100	4	8	1.53	100.01
Total	50	100			522		100

Degree of market transparency

According to IOSC (2001) market transparency is generally regarded as playing a central role in promoting the fairness and the efficiency of markets. To the extent that competition in the provision of trade execution services fragments a market, regulators need to consider the adequacy of the transparency arrangements for individual 'trading venues' as well as the necessity and ability to consolidate this information.

Having a knowledge and good information about the market signifies a better competition and efficiency of the market than the existence of a large number of buyers and sellers does [17]. The degree of market transparency refers to the adequacy, timeless and reliability of market information that the traders have for their marketing decision.

In the study areas market information about sources of milk, demand and price was gathered from different sources *i.e.* from personal observation, telephone and other traders in the areas. Now a day's business organization considered information as one of the power that helps to get a better position in the market.

However, in the study areas sources and number of information sources were limited. Survey result revealed that direct visit or personal environmental observation plays an important source of information in milk market. As indicated in Table 6 below there was a big difference especially in number of source of milk market in formation among marketers which likely to be non-transparency in the market. In the overall market event, direct personal observation, using telephone and other milk traders were sources of market information in 33%, 15% and 2% percentage share respectively.

TABLE 6
Sources of milk market information

Market/business area	Source of market information	Frequency	Percentage share
Amanuel	Direct personal observation	15	75
	Other milk traders	2	10
	Using telephone	3	15
Dembecha	Direct personal observation	7	46.7
	Other milk traders	3	20
	Using telephone	5	33.3
D/Markos	Direct personal observation	3	60
	Other milk traders	0	0
	Using telephone	2	40
F/Selam	Direct personal observation	0	0
	Other milk traders	1	25
	Using telephone	3	75
G/Kidamin	Direct personal observation	0	0
	Other milk traders	4	100
	Using telephone	0	0
Yewula	Direct personal observation	2	100
	Other milk traders	0	0
	Using telephone	0	0
Total event	Direct personal observation	33	66
	Other milk traders	2	4
	Using telephone	15	30

Market barriers to entry

Barriers to entry are factors that prevent a startup from entering a particular market. Even though barriers to entry in agricultural business are limited especially in developing countries, an entry barrier to the market affects especially new business in a various ways. In this study different socio-economic as well as administrative issues were considered to see market barriers to entry in milk trades in the study areas.

Experience in the business: Business experience indicates the time period or number of year's milk traders spends to execute his/her business. Survey result indicated that the minimum and maximum number of experience in milk business were 1 and 5 years respectively with mean and standard deviation of 2.54 and 1.11 respectively [18]. This result signifies that majority of milk traders were not oldest business expertise that can devise strategy to prevent other new entrants in the business *i.e.* within 1 to 5 years of experience. This implied that experience can affect managerial skill and know-how for traders. Thus, number of years spend in the business (experience) did not an issue for market entry in the study areas.

Nature of the product: Milk is among the most perishable animal products known in human food and feeding system. Survey result indicated that 72% of sample traders reported that nature of the product was one of the major market bottle necks in the study areas. Moreover, survey results revealed that the minimum volume of milk purchased and sold per day was 4 and 3 liters respectively which indicated that there is one liter of milk left every day. From informal survey traders explained that fluid milk is more profitable than processed products. Thus, this one liter of milk left would go to other milk products that traders did not interested and thus nature of the product was found to be an entry barrier for milk traders in the area.

Licensing process: It is a policy issue that all traders must fulfill in order to run the business lawfully. From informal survey traders reported that they did not have single trade license for milk. This is because milk is consumed seasonally and thus not preferable and profitable business for year round traders. All traders reported that they licensed for combined trade license and 90% of sample traders reported that trade license procedures were easy. Trade license process was not seemed to be barriers to entry in milk market in the study areas.

Working capital: Finance is a blood line for business especially in this competitive time period. Start up as well as working capital can affect the decision of traders regarding to his/her business. The minimum and maximum amount of working capital was found to be 800 and 30,000 Ethiopian birr from their own sources [19]. And also survey result showed that the minimum and maximum volume of milk traders purchased were 4 and 18 liters of milk per day respectively. Thus, working capital for milk business in the study areas did not seemed to be barrier to entry to the business.

Price fluctuation: Seasonal consumption nature of the people leads to price fluctuation. As survey result indicated that 97.5% of sample respondents were orthodox Christian followers that abstain from animal product consumption for more than 200 days in a year that leads to down the price and it goes up out of these days. Survey result revealed that 54% of sample traders reported that price fluctuation is a constraint to enter in to milk retail business.

Milk market conduct

Market conduct is the patterns of commercial behavior that firms follows in adjusting to the markets in which they sell or buy. To assess market conduct

in the study areas buying and selling behavior of traders as well as price setting strategies of traders were covered.

Buying and selling behaviors of traders: In the study areas fluid milk was passed from small holder farmers *via* milk cooperatives, small milk houses, hotels or cafes to ultimate consumers. Survey from milk producers indicated that they did not set price that sell to cooperatives or other buyers in the study areas. From market survey 64% of sample traders indicated that milk purchase price was set by traders in the study areas.

Moreover, informal survey traders reported that their customers were attracted by quality of milk supplied while 62% of suppliers were attracted by creating relationship in the business. Survey result showed that 74% of sample traders visit the market to seek information only once per week in the study areas (Table 7).

TABLE 7

Traders behaviors in fluid milk transaction

Traders behaviors	Items	Frequency	Percentage share
Who set your purchasing price	Negotiation	14	28
	Me/myself	32	64
	Sellers	4	8
Who set your selling price	Me/myself	38	76
	Market supply and demand	12	24
	Buyers	0	0
	Give better price	3	6
How did you attract suppliers	Fair scaling	3	6
	Build relationship	31	62
	Visiting them	13	26
	Low/better price	0	0
How did you attract buyers	Quality of the product	50	100
	Fair scaling	0	0
Term of payment at purchase and sell	Cash	50	100
	Credit	0	0
	Advance payment	0	0

Milk market performance

Marketing costs and margin analysis: In market structure-conduct-performance paradigm, marketing performance analysis, margin or price spread can be useful descriptive statistics if it used to show how the consumers' price is divided among participants at different levels of marketing system Mendoza. Marketing costs and margin analysis tells about marketing performance in the value chain. In value chain analysis who incur what cost and who get what share from its contribution in the product flow along the value chain creates an important understanding about market efficiency in the chain. In this study, smallholder milk producers'' performance was conduct using producers share and other intermediaries'' performance measurement was done by calculating gross margin and market margin along the value chain actors that involved in the marketing channels.

Milk producers incurred cost to produce milk that include feed cost, veterinary services and labour costs were the main production considers in this study. According to Erge et al., as most of rural households used their own family labour, using an opportunity cost of production is important.

As indicated in Figure 3 feed cost was the largest expense farmers incurred in milk production. This is because as informal survey signifies communal grazing areas are taken by investors and for house building due to urban expansion. Labor was second most expense by the farmers in milk production. Regarding labor, dairy cow keeper farmers reported that urban expansion and education leads to labor force migration to towns and other non- farm activities.

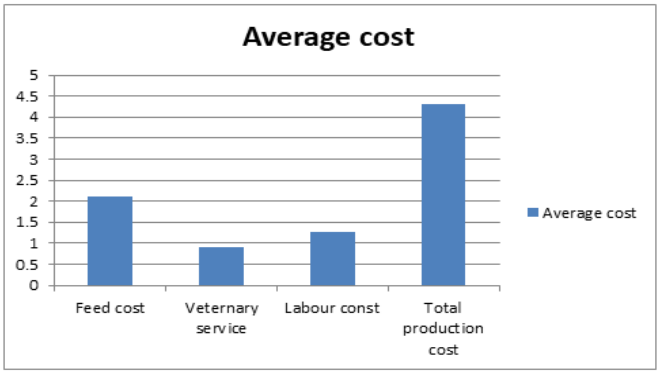

Figure 3: Indicates milk production cost components

When milk moves from one hand of the actor to the next node value was added. As the product passes across nodes in the chain not only value was added but also actors incurred cost. To see market fairness along the market channel, cost and benefits comparisons was made in between milk producers and other market participants down to the consumers. As indicated in Table 8 the cost per liter for milk producers was 1.3 times higher than the cost incurring by hotels or cafes and 3.2 times higher than small milk sheds in the study areas. However, in the stream of benefits, producers profit share was found to be 1.08 times more than profit shares of hotels or cafes and 1.37 times higher than small milk shed in the study areas. This result indicated that cost and benefit distribution was not distribute fairly in the study areas.

Table 8

Average marketing price and costs of fluid milk per liter

Cost items/liter	Producer	Cooperatives	Hotels/cafes	Small milk sheds/house

Production cost	4.3	-	-	-
Buying price	-	18.33	22	19.5
Marketing cost				
Storage cost	-	0.3	0.25	0.15
Loading/unloading	-	-	0.2	0.1
Transportation cost	-	-	1.19	0.89
Telephone cost	0.35	0.25	1	0.28
Other costs	0.55	1	1.25	0.2
Total market cost	0.9	1.55	3.89	1.62
Total cost	5.2	1.55	3.89	1.62
Total cost share%	42.41	12.64	31.73	13.21
Selling price	18.8	23	38.48	31
Marketing margin	14.5	4.67	16.48	11.5
Margin share in %	30.75	9.9	34.95	23.6
Profit margin	13.6	3.12	12.59	9.88
% of profit	34.7	7.96	32.12	25.21

Marketing margin of milk traders at different marketing channels: Ismail, explained that analysis of marketing costs and margins would reveal how efficient pricing in domestic markets is, and gives an indication of the importance of transaction costs facing traders, farmers and intermediaries (middlemen) and help in identifying and solving bottleneck thus assist in reducing marketing costs along the product flow. Analyzing total marketing margin is based on the price paid by the final destination of the product or the end buyer and expressed in percentage.

As indicated in Table 9 below, Total Gross Marketing Margin (TGMM) was highest in channel II (50.62%) of the consumers' price followed by marketing channel IV (43.75%). This is because in these two marketing channels actors involved in to move milk down to consumers were more as compared to other marketing channels in the study areas. Thus, the more the number of market channel participants the less the producers' marketing margin (GMMpro) or producers' share as indicated in Table 9. This is due to the fact that as the product passes from one actor's hand to the next, value was added and thus diminishes producers' share. On the other hand, Total Gross Marketing Margin (TGMM) was lowest at channel I (28%) without considering channel V that milk producers directly sell to ultimate consumers. This means that as the number of participants between milk producers and ultimate consumers are small in number, Total Gross Marketing Margin (TGMM) diminishes that in turn increases producers' share (GMMpro). In addition to this producers sell to milk cooperatives at a reasonable price that tends to increase producers share at channel I and IV that in small difference with channel III.

Table 9
Margin share of actors at different marketing channel

Marketing margin in %	Marketing channels				
	I	II	III	IV	V
TGMM	28	50.62	43.33	43.75	--
GMMsm	---	---	43.33	31.25	--
GMMcoop	28	13.64	--	18.18	--
GMMhot	--	42.83	--	--	---
GMMpro	72	49.38	56.67	56.25	100

CONCLUSION

Though dairy cattle population is leading in the continent, smallholder farmers in Ethiopia do not exploit the dairy sector potential to its expected source of income and nutrition. For this study, data were collected from five Kebeles in the two districts, three Kebeles from Machakel district and two Kebeles from Dembecha district in a total of 244 randomly selected milk producers. Additionally, 50 milk traders as well as 20 consumers were included to collect the primary data from both districts using appropriate tools. Results revealed that, five marketing channels were identified and milk producer farmers-milk cooperatives-hotels/cafes-consumers carried the highest volume of milk (179.208 liters) which needs a closed attention that farmers can do better if obstacles reduced *via* this channel whereas milk producer farmers-ultimate consumers carried the lowest volume of milk (25.20 liters) in the study districts.

Result from market concentration ratio indicated that milk market was weak oligopoly market type which is non-competitive among milk traders in the study areas. In marketing performance, feed cost was found to be the highest (49.30%) in milk product cost composition. In fluid milk marketing producers' take the highest total cost share (42.41%) in the market but their marketing margin was less that of hotels and cafes in the area which indicates inefficient market. TGMM was highest in channel II (50.62%) and lowest in channel I (28%) without considering marketing channel V that producers take all portions of consumers' price. Producers' gross marketing margin or producers' share was the highest in marketing channel I (72%) that milk producers sell to milk cooperatives in a better price. Whereas producers' gross marketing margin was lowest in marketing channel II (49.38%) that milk moves *via* producers-cooperatives-hotels/cafes-consumers that hotels added value to milk and take high portion of the consumers' price.

Thus, in both districts, dairy development projects, government through Woreda office of agriculture should consider Woreda office of agriculture, multipurpose farmers' cooperatives, private veterinary service providers, milk producers, milk cooperatives as well as local milk retailers in any intervention activities for dairy development. Integration between and among value chain actors is low and thus extension service providers should tell the benefit of cooperative working as a family to overcome the situation over supporting them in production.

As shown in the result milk marketing was found to be inefficient results from mainly price fluctuation and poor marketing actors' integration, traditional activities. Results from FGD also reported that extension regarding dairy is focusing mainly on production thus, both Woreda office of agriculture should integrate production extension service with milk marketing and income generation ability of the business by calling and inviting model milk producers in FTC and other discussion meetings.

CONFLICTS OF INTEREST

The authors declared that they have no any conflicts of interest.

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