Quest Journals
Journal of Research in Agriculture and Animal Science
Volume 10 ~ Issue 10 (2023) pp: 19-25
ISSN(Online) : 2321-9459
www.questjournals.org

Research Paper

Marketing and processing challenges of milk in Mogadishu, Somalia

Musab Mohamed Muse, Yusuf Kassim Awow and Osman Ahmed Mohamed
[1]*Faculty of Veterinary Medicine and Animal Husbandry, Somali National University, Mogadishu- Somalia.*

Abstract
Milk processing and marketing are critical stages in the dairy industry's development. Most pastoralists in developing nations rely on the dairy trade for their livelihood. While dairy processing in the manufacturing of various dairy products has attracted the interest of many dairy farmers and consumers, post-conflict countries face numerous obstacles as a result of their lack of well-functioning systems. The goal of this research is to evaluate the state of the dairy market as well as the issues it faces and the hurdles to milk processing. A total of 100 Mogadishu-based marketers and pastoralists took part in the survey. The information was gathered through an interview utilising a structured questionnaire. Excel was used to examine the data.
Consequently, milk traders made up around 75% of the research participants, and smallholders made up 25%. The dairy market was dominated at the time by women. Most of the milk supplies originated from Abakaaro, and cow's milk was the most abundant on the market, followed by camel milk. Since milk was most in demand in the spring, it was challenging to procure milk on a regular basis. All marketers and cattle owners, however, sell milk without conducting any kind of quality or quantity testing. The biggest obstacles to the market for leftover milk were roadblocks and inadequate infrastructure, which accounted for 72%, 17%, and 11% of the issues. As a result, the majority of the leftover milk would eventually be disposed of.
Conversely, the largest obstacles to dairy processing in Mogadishu were 51% equipment shortage, 26% high electricity costs, and 18% lack of industrial understanding. Since butter was the only milk product that underwent traditional processing, this study concludes that in order to address the issues that farmers and marketers face, road improvements, ways to alleviate cooling shortages in dairy markets, lower electricity costs, and advancements in technology are all advised.
Keywords*: processing, market,diary challenges.*

R*eceived 10 Oct, 2023;* ***R****evised 22 Oct., 2023;* ***A****ccepted 24 Oct., 2023 © The author(s) 2023.*
P*ublished with open access at* ***www.questjournals.org***

I. Introduction

For the past three decades, the people of the world have turned their attention to dairy production, as it has become a source of income for many families as well as a source of livelihood and nutrition. Approximately 150 million households around the globe are engaged in milk production. Most developing countries have increased their global share of milk production, which is a significant increase in global milk production by more than 59 percent, from 530 million tones in 1988 to 843 million tones (82% cow milk, 14% buffalo milk, 2% goat milk, 1% sheep milk, and 0.3% camel milk) in 2018 (FAO, 2019).

Due to poverty and unfavourable weather, milk production in Africa grew very slowly, even slower than in developing nations. One of the eastern African nations recuperating from a drought is Somalia, where the output of milk has not increased significantly due to climate change. The primary source of revenue and means of subsistence for the Somali people in Somalia is milk production, which also contributes significantly to the GDP of the nation. It is often acknowledged that milk plays a crucial role in African pastoral societies. It has a significant impact on how society is organised, how people eat and trade, how techniques are developed and appropriated, and how cultural legacy is preserved through ceremonial and symbolic representations. Dairy has a long history with indigenous people such as the Maasai, Borani, Fulani, and Tuareg. They share many customs and see milk as a peaceful product that is freely given to family, friends, and guests (Ndambi et al. 2007).

The average milk production in Somalia has changed between 1970 and 2019, which tended to increase by 2.14 million metric tonnes in 2019 (Knoema, 2019). What makes this area so important is that many people's lives depend directly on the cost of selling livestock or milk. While marketing is essential for the sustainability of

any business, dairy marketing is very important for small dairy farmers. Who mainly use to generate their daily life goods? Selling milk is the main source of income for smallholder farmers, in addition to the occasional sale of live animals to solve the big issues facing the family, while milk is the daily income of the family by exchanging the proceeds for services important for daily life.

As production and marketing milk are the backbone of the Somali population, Somalis, unlike the rest of the world, often raise large numbers of camels; cows are also used to produce milk; and goats are often not raised for production instead of being marketed or operated on when the family is in a situation. Cattle are the largest livestock species reared for the production of milk in Somalia; however, Somalian smallholders claim problems such as disease, drought, and lack of land are most affecting constraints on their milk production. According to a study conducted on the reproductive efficiency of cattle breeds in Somalia, the average milk production of local breeds per day is 8 litres, is a very small amount compared to the food they eat and the other breeds in the world (Hassan, M., el., 2020).

In Puntland, a variety of marketing methods exist, with women being the primary controllers of milk marketing. Women are also primarily responsible for the transportation of milk from one location to another. The network chain of the milk market passes through several hands before reaching the consumer; there are primary milk collectors who sell milk to secondary collectors, who then sell it to milk trailers and finally to consumers. (Michele Nori, 2010).

Meanwhile in Ethiopia, there are severe constraints in marketing milk and its product. The major constraints for milk and milk products marketing identified by the farmers were low price of milk (77.4%), poor quality of milk/sour milk (13.7%), and lack of transportation (5.5%), no market (2.1%) and others (1.4%) such as high cost of transport, long distance to market, low products and lack of milk preservation methods for buttermilk and cottage cheese (M G.Keshamo, 2019). The competition for milk in the market is very low, with regular milk drinking being the only way Somali population use milk,Processing dairy products is a major challenge in Somalia as well as in developing countries.

In the world of dairy products the challenge is huge and the reasons vary. Developing countries are the ones that deal most with the problem of milk shortage which forces farmers to lose money when they run out of milk. Only about 15% of the total milk produced in Africa gets processed into standard products (cheese, yogurt, butter, etc). More than 70% of overall produce is sold on the black market or consumed on the farm.(Ndambi O A, Hemme T and Latacz-Lohmann U 2007).

According to (Misganaw G, 2017) Raw milk is the sole dairy product consistently given to local consumers by dairy cooperatives in Ethiopia, Lack of milk processing facilities and skills (88.8%), insufficient production space (36.7%), an uncertain selling system (57.3%), a lack of water (71.7%), and dairy cows with low milk production potential were the top production and processing issues (82.3 percent). While in Kenya, 71 percent of total milk handled by dairies was sold as raw milk, 22 percent was fermented milk, 6.9% was boiled, and a meager 0.1 percent was processed into yogurt.

Meanwhile, the most significant hindrance to milk processing is a lack of equipment and skills, while rivalry for market share from other dairies poses the greatest threat to the industry's expansion in the region. Another study was done on 17 dairies in 11 trade locations in Eastern Kenya's semi-arid region, with the goal of better understanding the functioning of milk processing and marketing systems and developing interventions to boost the dairy industry's growth. The dairy could only get raw milk from smallholder farmers. Dairies are not specialised, and only a few product lines are processed. Dairies sold 71 percent of the milk they handled as raw milk, 22 percent as fermented milk, 6.9% as boiled milk, and a meagre 0.1 percent as yogurt. The most significant hindrance to milk processing is a lack of equipment and knowledge. (Njarui, Donald, et al., 2010).

II. Materials and methods

The research was carried out in the capital city of Somalia's Benadir Region. This research analyzes the essential market position and challenges of milk processing in Mogadishu. The researcher decided that a structured survey would be the best strategy for the investigation. To draw attention to the situation and to be able to gather and give information regarding the state of milk marketing and processing in Mogadishu, Somalia. The study was cross-sectional and took place from September 2021 to February 2022, with 100 respondents being interviewed for both qualitative and quantitative data.

Sample size and procedure

The desired sample size is calculated by using Slovan's statistical formula, the calculation was as fallow:
N=134, e= 5%, 0.05, n=100

III. Result and discussion

In general, overall of 100 respondents about 91% Female and 9% Male were participated in this survey,the participants have different occupation 75% ,25% were Milk traders, smallholders respectively.

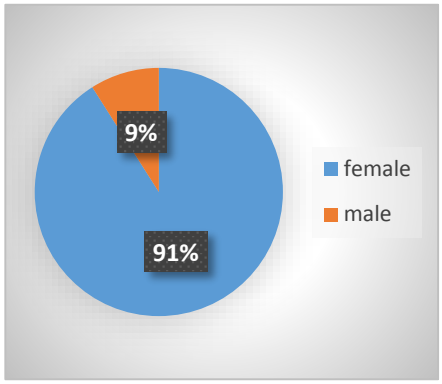

Figure1: Gender

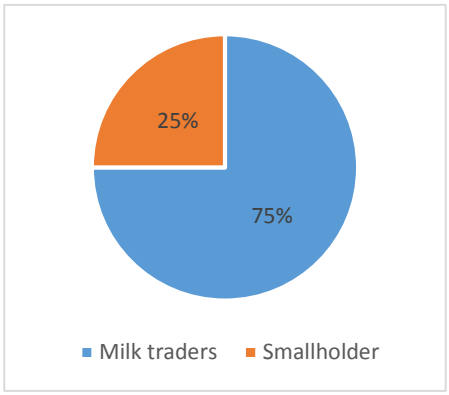

Figure 2: occupation of ponderers

This table shows that most of repondents use or sell cattle milk around 62.% while 37% were selling Camel and remaining 1.% were selling Goat milk.

Table 1: Type of milk in the market

Type of milk in the market	Percentage
Cattle	62.%
Camel	37,%
Goat	1,%

In the base, 54 percent acquire their milk from Abakaaro, while 46 percent get it directly from dairy farmers without the need for a third party. As many as 67.7% believe it is simpler to get milk every day, while 32.3 believe it is difficult to get milk on a regular basis. Because the seasons are the most important factor affecting milk availability throughout the year, 96 percent of respondents agreed that the highest percentage of milk is available in the spring, while the remaining 4% said summer, and 100% of respondents said there are changes to the milk during transportation. since there are no milk storage facilities and the dairy business is undeveloped. Milk traders and small farmers who took part in this study unanimously agreed that no tests of the milk for additives or composition should be conducted.

Table 2: Market challenges

Market challenges	Percentage
milk remaining	72%
No access of milk	17%
road closures for security	11%

Concerning the main reason for the milk supply is economic, milk traders and small holders face significant challenges in the market, with 72 percent claiming that milk remaining in the market , 17 percent claiming that they do not have access to milk, and the remaining 11 percent claiming that road closures for security reasons have a negative impact on the market.

milk Remaining

The largest issue for milk dealers and smallholders in the market is unsold milk that remains in the market. 64% of the residual milk is dumped, 21% is stored in a cool, non-refrigerated environment, and 15% is transformed to fermented milk and Suusac.

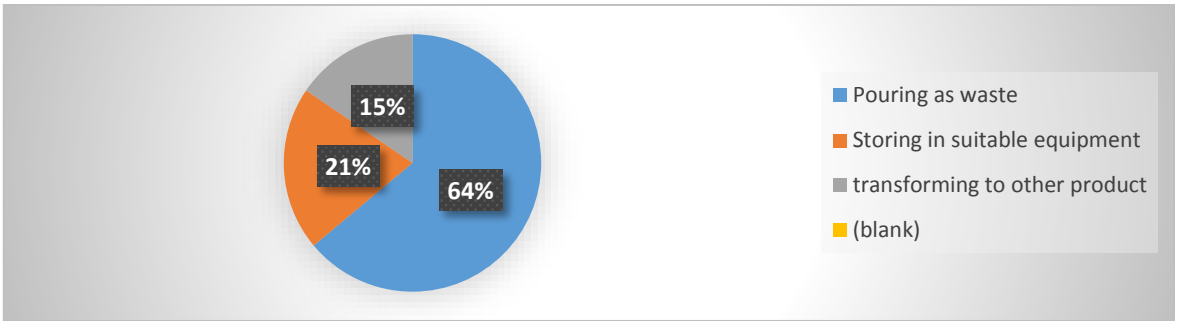

Figure 3: Remaining milk

Table 3: Challenges against processing

Challenges against processing	Percentage
Lack of needed equipment	50%
Expensive of electricity	26%
Lack of knowledge	18%
Lack of market demand for dairy products	5%
Poor Milk quality	1%

The aforementioned table illustrates the primary obstacles to milk processing faced by those milk dealers and smallholders. Of them, 50% cited a lack of necessary processing equipment as their top obstacle, with power coming in second with 26.% of respondents and 18% citing ignorance as an excuse. Meanwhile, poor milk quality accounts for 1% and lack of market demand for 5% of the total.

Dairy product preference

Butter was the main milk product of interest, and 88.9% prefer eating dairy products. Approximately 96 percent of respondents selected butter and 4% said ice cream.

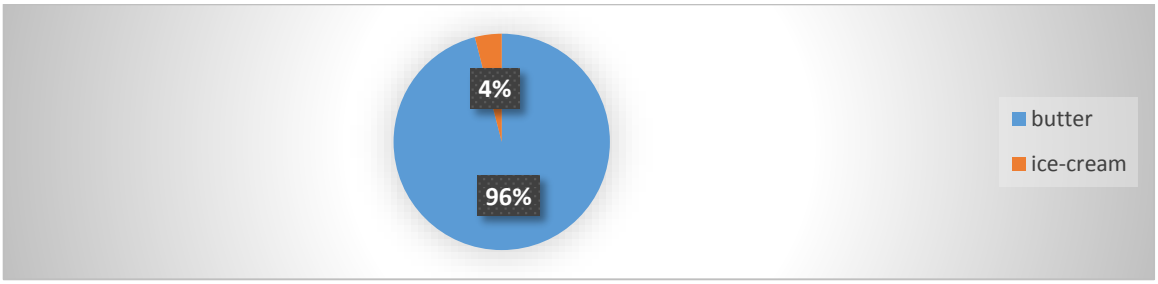

Figure 4: dairy product preference

IV. Discussion

Dairy markets in somalia are mostly informal, The majority of livestock owners sell milk to their neighbors, but others near the city carry it directly to the market. However, because of economic and transportation issues, smallholders residing outside of the city did not deliver milk directly to the market, and instead used a third party called Abakaaro (milk collectors) to connect pastoralists and traders.

The majority of the Abakaaro have centers on the outskirts of cities, while some go directly to the countryside to fetch milk and transfer it to the market.a similar study (Melesse K, 2014) found that the majority of milk producers delivered their milk either to their own cooperatives, collectors, or processors, while also in Ethiopia. In the country as a whole, milk is distributed by informal (traditional) means from farmers to consumers in both rural and urban areas, During the rainy season and winter seasons, demand and sales drop significantly, resulting in a reduction in incoming raw milk volume from smallholder producers in order to match supply and demand. (Zegeye Yigezu, 2003).

Women made up the majority of the participants in the study91%, indicating that women are more prone to trade in milk. The reasons why men are less so is a cultural issue, as males are typically the ones that

transport milk. In a similar study conducted in the east part of Somalia, (Michele Nori, 2010) discovered that women were controlled by the dairy market. Cow's milk was the most commonly available product on the market 62.%, while camel milk was 37% the second most widely available product on the market, according to marketers and livestock owners. that was similar to the Ethothoipa study in Diri dhawa Cattle account up the majority of the TLU population (55.4%), followed by camels (15.3%), goats (13.7%), and sheep (6.4%).

(Hussen, Kedija at el ,2008) Also, according to Zegeye Yigezu (2003), cattle are the primary supply of milk, despite the fact that they are largely retained as a source of drought power, with little or no attention paid to increasing their milk production capacities. In Ethiopia, no reliable system for marketing milk and milk products has been devised.Goat milk Only one livestock owner used goat milk to market and the reason why goat milk is not marketed is that Somali people often use it for drinking at home. Since the city of Mogadishu does not have large milk production farms,yet the main source of milk are the smallholders outside the city and the Abakaaro women that collect milk from the countryside.

Abakaaro is a dairy co-operative that operates as a milk collector even though they do not have the equipment needed for milk collection.(Debre Zeit 2013) made simaliar observation in Ethiopia The major sources of milk and milk products in the woreda were producers, supermarkets, Genesis farm, open markets and cooperatives. The daily access pattern of milk supply in the market 68% of the participants considered it normal, while 32% of them believed it was not very easy to get milk every day. Moreover, the most popular milk availability season on the market was spring (96%), which is a prosperous season, which is said by marketers and pastoralists to be the highest in the milk market, and instead, winter is the low milk season. Milk changes during delivery were highly common, with 86 percent of participants claiming that milk changes as a result of the extended driving time and the lack of suitable equipment for milk preservation when milk comes out of the udder. Because these districts are located in peri-urban areas with poorly developed infrastructure and marketing organisations, the time it takes to supply milk is substantially longer than in other developing countries.

Milk was provided to collectors, processors, cooperatives, and consumers on average 30 minutes after milking (Melesse, Kassahun, Agza, Bilatu Melesse, and Adey 2014). According to the study's overall number of cattle owners and milk traders, there was no test for milk quality or quantity. This means that not all dairy products on the market are subject to standard market quality standards. According to a report by Tolosa, T., and El (2016), in Ethiopia, milk was sold to shops (71%) and straight to customers (25%) without any quality control, with only 4% consumed by the producer. Melesse, on the other hand, was founded by Kassahun in 2014. In two Ethiopian areas, nearly similar amounts (5%) of producers sold raw milk directly to consumers at their farm gate without undertaking rigorous quality testing, while 95% did.

After the collapse of the central government, there was no improvement in the milk markets and milk collection points. However, dairy traders face many of the same challenges in developing countries, such as a lack of good roads that impede milk supply (17%), and a 72% lack of market (remaining milk) was another challenge for marketers. Similar to what was seen in Ethiopia, there was no transportation service that met camel herders' requirement to transport their milk great distances to markets; thus, they were compelled to sell their produce at the farm gate. Women in the Somali region were compelled to sell their milk by the side of the road due to a lack of marketing facilities. In addition, due to a lack of infrastructure, traditional milk value addition was not possible (Gebremichael Belets et al., 2019).

Meanwhile, camel herders and informal cooperatives have been seen selling milk on the side of the road in plastic containers that are highly likely to be polluted and destroy the milk. Similarly, in Somalia, inadequate milk storage and processing facilities resulted in milk loss (Kebede et al., 2015). The lack of marketable milk has been a major challenge for farmers and pastoralists. Most people who took part in the study said they dumped the remaining milk on the grounds as they did not have enough space and equipment to store the milk.

The country also lacks many dairy factories and milk collectors' ready-to-store. As a result, about 15% of the people that were interviewed said that they process milk using traditional methods as dairy products are not available or expensive. Camel milk is frequently used to boil because it cannot be processed into butter, whereas un-marketed cow milk is converted to fermented milk and butter. In a comparable study (Alamz 2001) on a field survey of Ethiopian traditional fermented milk products, the most similar traditional product was yoghurt. Traditional fermented curd or ititu, traditional butter or kibe, neter kibe or traditional ghee, ayib (cottage cheese), arrera (defatted buttermilk), and augat (traditional whey) are among the other products. According to (Redda2022), Butter is the most valuable value-added product produced in Ethiopia. To prevent direct sunlight, 21% of those participated indicated they would boil the milk and store it on the market's side in a tiny covered space.

Camel milk is heated before being stored, and if the containers are not contaminated, it can be kept for one to two days without needing to be changed.In Ethiopia, a similar procedure was practiced For the majority of homes in Ada'a woreda, smoking milk and milk-related equipment was a common habit. Except for high-income households in urban regions, practically all peri-urban and rural homes smoked milk and milk-processing equipment to add taste and/or extend the shelf life of milk products. However, 13.3% of rural high-income households utilized refrigerators to preserve milk. Raw milk is preserved in the majority of peri-urban and rural households either at room temperature without pre-treatment or after boiling (Melesse, Kassahun, 2013).

Both pastoralists and traders in Somalia confront considerable hurdles when it comes to processing milk: 50. percent lack of equipment, 26 percent expensive electricity, and 18 percent lack of knowledge of industrial science are the three largest issues facing the dairy business.Poor milk quality and low market demand

(5 percent and 1 percent, respectively) were additional factors, as some consumers were unfamiliar with dairy products. In contrast, a research conducted in Ethiopia found that milk supply through the informal market accounted for 95.24 percent of the issues in the country's milk processing sectors. Approximately 81.62 percent of the issues in the milk processing industry were shortages of milk in both quality and quantity due to a lack of understanding among milk producers and collectors about quality milk production, collection, and quality control.

In comparable to Ethiopia's problems, About 63.48 percent of milk processing companies lack cold truck vehicles to collect milk from producers or collecting centers and deliver finished goods to markets or customers, and another difficulty was power outages and unpredictable current flows. In about 36.29 percent of milk processing industries, there is an electric power outage that prevents the machine from running and has an erratic current flow that can distract some components of the machine (Tesfaye, Mulugeta at el, 2019). In this study, the consumption level of milk and milk products was very low, with 98 percent of participants saying they did not eat milk by products, while butter was the most consumed milk by product. A similar result was obtained in Ethiopia, where the consumption level of milk and milk products was very low, with some households having zero consumption of milk products.

V. Conclusion and recommendation

At the processing and marketing levels, the study supplied baseline data on the dairy cattle value chain. In Somalia, dairy traders mostly derive their milk from Abakaaroyo, while others import it directly from smallholders. Cow and camel milk were the most abundant on the market, although daily availability of milk was difficult at summer, while spring was a torrent.as market challenges were high yet remaining milk, poor road infrastructure and Closing the roads for Security reasons are a major problem for Mogadishu businesses. While the lack of equipment needed, expensive electricity and lack of milk processing skills were the main barriers to manufacturing of milk.

As a result, the following recommendations are made in order to better understand the situation of the dairy market as well as concerns related to milk marketing and processing.

a. Dairies must diversify their products through value addition by employing simple and cost-effective milk processing processes in order to remain competitive.

b. Providing pastoralists with ongoing training would transform the customary practice of selling milk, hence increasing household income.

c. To avoid problems in the dairy market Priority should be given to road development in the same way that refrigeration equipment is made available to eliminate dumping milk in street.

d. A major solution must be found to the electricity crisis (expensive and in most areas there is no electricity) to make it easier for pastoralists to process milk.

e. The state government should call privately investors to operate the dairy market and establish milk collecting center and market comparative chains in line with international standards by testing their quality and quantity.

Acknowledgments

Primarily, I would like to convey my heartfelt gratitude to the Somali institute of agriculture and livestock studies for study grant, my thanks also extended to the management of the dairies and milk traders for their assistance during the survey, also Somali National University which offered the necessary space and resources to complete this research.

References

[1]. Agza, B, Melesse, K., Funga, A & Melesse, K. (2013). Assessment of knowledge gap and factors affecting consumption of dairy products in Ada'a and Lume districts of East Showa Zone, Ethiopia. African Journal of Food Science and Technology, 4(9), 201-210.
[2]. Balikowa, D. (2011). Dairy Development in Uganda: A Review of Uganda's Dairy Industry. Dairy Dev. Authority Uganda. 3202, 1.
[3]. FAO. (2019). dairy-production-products/production.
[4]. Gebremichael, B, Girmay, S, & Gebru, M. u. (2019). Camel milk production and marketing: Pastoral areas of Afar, Ethiopia. Pastoralism, 9(1), 1-11.
[5]. Gonfa, A, & Foster, H. (2001). Field survey and literature review on traditional fermented milk products of Ethiopia. International Journal of Food Microbiology, 68, 173-186. doi:10.1016/S0168-1605(01)00492-5
[6]. Hassan, H. M., Dubad, A, Muse, M, Ali, A, & Ali, B. (2020). Assessment of Reproductive Efficiency and Herd Dynamics of Local Cattle Breeds in Benadir Region, Somalia. Advances in Animal and Veterinary Sciences, 8.
[7]. Hussen, K, Tegegne, A, Yousuf, M., & Gebremedhin, B. (2008). Cow and camel milk production and marketing in agro-pastoral and mixed crop-livestock systems in Ethiopia.
[8]. International, R. (2021) Somalia-camel-milk-value-chain-analysis.pdf>.
[9]. International, R. (2021). Camel Milk Rapid Value Chain Analysis.
[10]. Keshamo, M. G. (2019). Cow Milk Production, Practices and Marketing System of Milk and Milk Products in Sodo Zuria District, Wolaita Zone, Southern Ethiopia.
[11]. Knoema. (2019). Somalia Production of milk, 1961-2020.

[12]. Melesse, K. (2013). Sources of milk products, milk and milk products handling preservation and spices added to the milk products in ada'a woreda, Ethiopia. International Journal of Agriculture, 3(1), 6.
[13]. Melesse, K., Agza, B., & Melesse, A. (2014). Milk marketing and post-harvest loss problem in Ada'a and Lume districts of east Shoa Zone, Central Ethiopia. Sky J Food Sci, 3(4), 27-33.
[14]. Misganaw, G., Hailemariam, F., Mamo, D., Tajebe, S., & Nigussie, Y. (2017). Production Potential, Challenges and Prospects of Dairy Cooperatives in Aksum and Adwa Towns, Ethiopia. Journal of Dairy, Veterinary & Animal Research, 5.
[15]. Ndambi, O. A., Hemme, T., & Latacz Lohmann, U. (2007). Dairying in Africa - Status and recent developments. Livestock research for rural development, 19.
[16]. Ndambi, O. A., Hemme, T., & Latacz Lohmann, U. (2007). Dairying in Africa - Status and recent developments. Livestock research for rural development, 19.
[17]. Njarui, D., Gatheru, M., Wambua, J., Nguluu, S., Mwangi, D., & Keya, G. A. (2010). Challenges in milk processing and marketing among dairies in the semi-arid tropical Kenya. 22.
[18]. Nori, M. (2010). Along the Milky Way: Marketing Camel Milk in Puntland, Somalia.The European Journal of Development Research, 22(5), 696-714. doi:10.1057/ejdr.2010.40
[19]. Nori, M., Kenyanjui, M. B., Yusuf, M. A., & Mohammed, F. H. (2006). Milking drylands: the marketing of camel milk in north-east Somalia. Nomadic Peoples, 10(1), 9-28. Retrieved from http://www.jstor.org/stable/43124131
[20]. Redda, T. (2002). Small-scale milk marketing and processing in Ethiopia. Paper presented at the Smallholder dairy production and market opportunity and constraints. Proceeding of a South–South workshop held at NDDB, Anand, India, and 13–16 March 2001.
[21]. Sisay Kebede, G. A. a. L. Z. (2015). The contribution of camel milk to pastoralist livelihoods in Ethiopia: An economic assessment in Somali Regional State.
[22]. Tesfaye, M., Beze, A., & Degema, K. (2019). Dairy plant processing capacity and challenges in milk processing industry of Ethiopia. European Journal of Biological Sciences, 11(3), 106-113.
[23]. Tolosa, T., Verbeke, J., Piepers, S., Tefera, M., Getachew, Y., Supré, K., & DeVliegher, S. (2016). Milk production, quality, and consumption in Jimma (Ethiopia): Facts and producers', retailers', and consumers' perspectives. Preventive veterinary medicine, 124, 9-14.
[24]. Wattiaux, M. A. (2006). Milk Composition and Nutritional Value. Dairy Essentials-Lactation and Milking. Babcock Institute for International Dairy Research and Development, Babcock Institute. USA.