

Trend of raw milk collection, milk processing constraints and opportunities in Ethiopia

Ararsa Gutema

Dairy input technology development desk, Livestock Development Institute, Addis Ababa, Ethiopia

*Corresponding author: Ararsa Gutema, Dairy input technology development desk, Livestock Development Institute, Addis Ababa, Ethiopia.

Received date: December 28, 2023; Accepted date: January 23, 2024; Published date: February 12, 2024

Citation: Ararsa Gutema, (2024), Trend of raw milk collection, milk processing constraints and opportunities in Ethiopia, *J. Nutrition and Food Processing*, 7(2); DOI:10.31579/2637-8914/156

Copyright: © 2024, Ararsa Gutema. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract:

Ethiopia is awarded from nature with cattle resource that brings it to the first stage from Africa and fifth from the world. Dairy production in Ethiopia is mainly rural small farming system with low productive indigenous cattle breed and an animal having multipurpose usage. Modern dairy product processing industries still infant and mostly dominated by traditional milk and milk products processing, due to regardless attention is given for dairy processing sector in the Ethiopia. Although modern dairy processing industries emerged in different part of the country, there is no constant in number of dairy processing industries which is up and down throughout different years due to disintegrated milk supply chain, poor milk quality, informal marketing, limit milk product processing technology, limited infrastructure and sociocultural impacts etc. are some of the limitation factors. Traditional milk product produced in Ethiopia are fermented yoghurt, traditional butter and butter milk, ghee and Cottage cheese. Whereas, modern milk and milk products are pasteurized milk, different type of yogurt and different kind of cheeses. Although, there are milk collection and milk product processing development constraints in Ethiopia, unexploited livestock resources in the country will an opportunities of milk and milk products processing investment. There for, this review paper is attempt to indicate the available dairy products processing investments opportunities and technical and non- technical constraints of milk collection and milk products processing in Ethiopia.

Key words: cattle population; multi-purpose; opportunity; dairy sector; limited technology

Introduction

Ethiopia is home for about 70 million head of cattle and 8.1 million camels. Out of the total cattle population, female cattle were about 56% and the remaining 44% were male (CSA, 2021) and 97.4% of the total cattle were local breed while the remaining % cattle hybrid and exotic breed that accounts for about 2.3% and 0.31% and milking-cows were about 15.04 million (CSA, 2021), total cow milk production from rural areas of Ethiopia was about 4.96 billion liters/year with an average lactation period seven months, and average yield 1.482 liters/day/cow. The estimated camel milk production for the same areas about 2.43 billion liters with the average lactation length nine months and the average milk yield 2.791 per liters/day (CSA, 2021).

Livestock production in Ethiopia mainly smallholder farming system with an animal having multipurpose use and it contributes about 16.5% of national gross domestic product (GDP) and 35.6% of the agricultural GDP (Metaferia et al. 2011). Also it contributes 15% of export earnings and 30% of agricultural employment (Behnke, 2010). However, the total national milk production is very low and unable to meet the domestic demand which force the country to import thousands tons of dairy products to overcome increasing milk and milk product demand of the country. Even though, Ethiopian cattle resource huge in number and

ranked from Africa as well as World, the community of Ethiopia milk consumption is 19kg per capita/ year (FAO2018). This is indicate low to the average per capita consumption of 27 L/year for African and very much below consumption levels of world health organization recommendation which is 230L per capita/year (FAO, 2014).

Milk processing in Ethiopia is affected with different factors such as; low-quality milk supply, low productivity of indigenous breed, limited and fragmented raw milk supply to processing factories, limited infrastructure, illegal milk and milk products marketing, socio-cultural and religious (fastening) factors, lack of quality milk based payment, etc. However; there are attractive opportunities of milk product processing which as immersing of dairy processing companies in different parts of Ethiopia, increasing of milk and milk products consumption demand, increasing human population and urbanization, Ethiopian government attention for dairy sector development, financial and technical intervention of different NGOs and private sectors willingness for dairy investment, etc.

Current milk processing status in Ethiopia

There are two milk processing systems practiced in Ethiopia which are traditional (cottage) and modern milk product processing. Traditional milk processing is widely practiced in Ethiopia, in which milk is processed to various traditional milk products such as; butter, cottage cheese, whey and fermented milk Haile Mikael M (2019). However, modern milk processing recently emerged with consists of small, medium and large scale in which milk is processed in to pasteurized milk, yogurt and different kind of cheeses and it not well developed in countries (Japaro AM, 2021).

Milk collection and milk processing in Ethiopia

Dairy production, processing and utilization in Ethiopia mostly traditional. Milk collection is one of primary activities of milk product processing and also it is done by following different procedures and techniques. The Milk collection and milk products processing still more tradition practice in Ethiopia (Belay D, 2021). The fresh milk collected from different dairy actors involves, small scale milk producers, large scale milk producers, milk cooperatives, milk collectors, etc.

Apart from consumption of raw milk, dairy products are widely used and considered as traditional recipe in the form of Butter/ghee, cottage cheese and traditional yoghurts to name the few (Bereda, A, 2014). Modern milk product processing involves, pasteurized milk, ultra-heat-treated milk (UHT), fermented milk, fruit flavored (UHT) milk cream, butter (i.e. used to make bread, cosmetics, table, and cooking butter), cheese (e.g. gouda,

mozzarella, cottage cheese, provolone, smoked, ricotta, fontina, feta, and cream cheese), and yoghurt (Japaro AM, 2021).

Milk and milk products marketing channels in Ethiopia

There are two milk marketing channels through smallholder dairy farmers sell their milk and milk products which commonly known as formal and informal milk marketing channels. Informal milk marketing channel is characterized by no license requirement to operate, low cost of operations, high producer price compared to formal milk marketing channel and no regulation of operations (Van der Valk and Tessama 2010). Most of the dairy farmers are prefer to sell milk through informal chain where they get high price per liter of milk (Girma D and Marco V, 2014). About 98% of milk produced in rural area was sold through informal chain, whereas; only 2% of the milk produced reached the final consumers through formal value chain (Van der Valk and Tessama 2010)

Milk collected and processed in the last 6 years in Ethiopia.

Milk collection, processing plan and numbers of milk processing companies of the last 6 years in Ethiopia is presented in (Table: 1). In Ethiopia most of the milk collection and processing follows traditional method with poor quality management practice; however, recently the country has been planned to collect raw milk and process to different milk products using modern technology annually, (EMDIDI, 2017-2022) unpublished of annual report.

| Year | Planned | Achieved | Achieved% | Nº. Companies |
|---------|--------------|--------------|-----------|---------------|
| 2016/17 | 110,040,000L | 81,428,750L | 74% | 26 |
| 2017/18 | 109,790,000L | 72,391,290L | 66% | 34 |
| 2018/19 | 114,600,000L | 96,276,000L | 84% | 33 |
| 2019/20 | 121,000,000L | 97,590,000L | 87% | 38 |
| 2020/21 | 102,000,000L | 90,800,000L | 90% | 28 |
| 2021/22 | 174,000,000L | 149,000,000L | 86% | 38 |

Table 1: Milk collection, processing plan and numbers of milk processing companies of the 6 years in Ethiopia
Ethiopia Meat and Dairy Industry development institute (EMDIDI) 2016/17 to 2021/22

The former Ethiopia Meat and Dairy Development Institute (EMDIDI) annual report indicated that, raw milk has been planned to collect and supply to modern dairy factories of the Ethiopia; in 2016/17 (110,040,000L), in 2017/18 (109,790,000L), in 2018/19 (114,000,000L),

in 2019/20 (210,000,000L), in 2020/21 (102,000,000L) and in 2021/22 (174,000,000L), respectively EMDIDI (2017-2022). (Fig.1) shows raw milk has been planned to collect and processed in Ethiopia in the past 6 years.

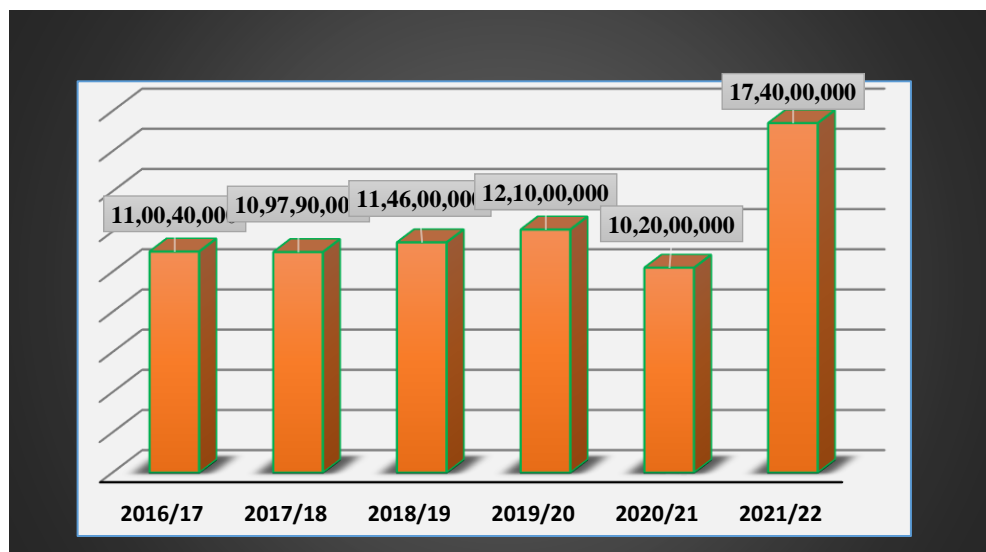


Figure 1: Fresh milk has been planned to collect and process in Ethiopia (EMDIDI, 2017 to 2022) reports

The status of milk collection and processing in the past 6 years using modern technology

According to the former Ethiopia Meat and Dairy Development Institute (EMDIDI) annual work report, the plan for raw milk collection and processing into different milk and milk products. In 2016/17 raw milk collection plan was (110,040,000L) with the annual achievement of 81,428,750L or (74%), in 2017/18 also there was raw milk collection plan (109,790,000L) with the annual achievement of 72,391,290L that was (66%), in 2018/19 it was (114,000,000L), from which about 92,276,000L

raw milk is collected and processed to different milk products with the annual achievement of (84%), in 2019/20 the raw milk collection plan was (210,000,000L) from which 97,590,000L raw milk collected and processed with annual achievement of (87%) , in 2020/21 it was (102,000,000L) and 90,800,000L raw milk was collected with the annual achievement of (90%) and in 2021/22 also it was raw milk collection plan (174,000,000L) from which 149,000,000L raw milk collected with the annual achievement of (86%) reports of EMDIDI (2017 to 2022). Milk collection and processing in past 6 year using modern technology in Ethiopia is indicated in (Figure 2)

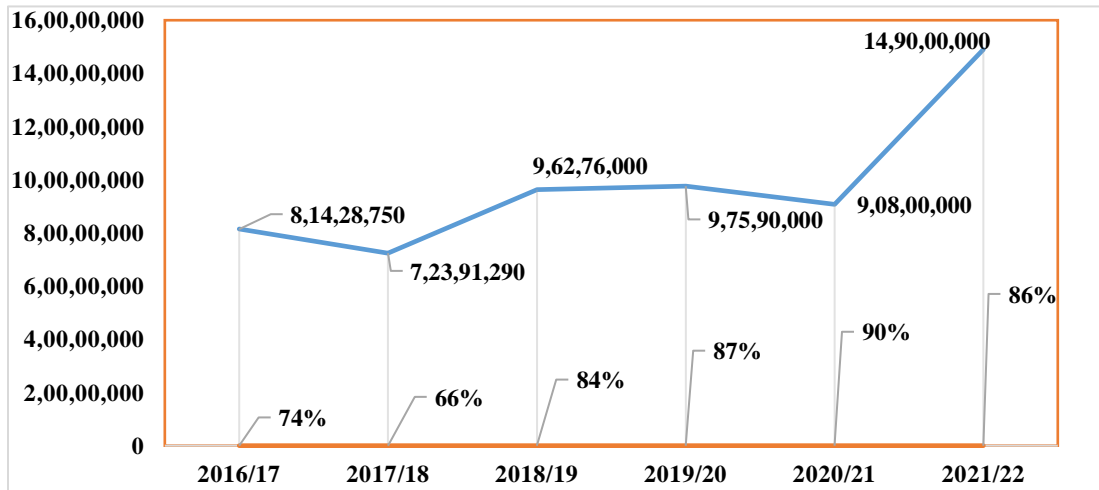


Figure 2: Annual report of Milk collection and processing in Ethiopia. Source (EMDIDI, 2017 to 2022)

Numbers of modern milk processing companies in Ethiopia

Milk and milk products processing systems are grouped in to two in categories Ethiopia which can mentioned as traditional and modern milk processing systems. However, in Ethiopia both traditional and modern milk processing systems are practiced, traditional milk processing system dominant over modern system due to modern dairy technology is yet infant in the country (O’Mahony F. and Peters J. 2004.) Traditional milk processing practice to produce natural fermented milk, traditional butter, buttermilk, cottage cheese, whey and ghee (Japaro A. M, 2021). Traditional milk processing is characterized with low quality of milk processing since unhygienic and non-food grade equipment used for milk handling and product processing which causes for high contamination of milk and milk products with microorganisms.

Although traditional milk and milk product processing is dominate though out the country, there are some modern milk and milk products processing companies in Ethiopia which are using sophisticate milk processing machineries either small or high scale machineries. In modern milk processing, there is less/ or no contamination of milk due to food grade equipment and machineries are used for milk product processing. Milk

and milk product safety and quality issues more concern in modern milk processing comparing to traditional milk processing system.

The number of dairy processing factories in Ethiopia in the past 6 years is presented in (Figure 3). The number of modern milk and milk products processing factories in Ethiopia has been showing up and down in the past 6 years. This variation number of milk processing factories of Ethiopia in different years due to different factors which could be low supportive of stakeholders, low quality milk supplied, shortage of working capital, illegal practices of milk processor, informal raw milk marketing are some examples and unstable supply of power Gebreselassie (2020) and EMDIDI (2016-2022).

According to former Ethiopia Meat and Dairy Industry Development Institute (EMDIDI) report shows in 2016/17 there were (26) dairy processing factories in the country which increased to (34) in 2017/18, which in 2018/19 was it decreased to (33) milk processing factories but it has showed increment again to (38) dairy processing factories in 2019/20. The number of milk processing factories has decreased to (28) in 2020/21, however; it was immediately raised up again to the previous position of (38) dairy processing factories in 2021/22, EMDIDI (2016/17 to 2021/22) annual work reports

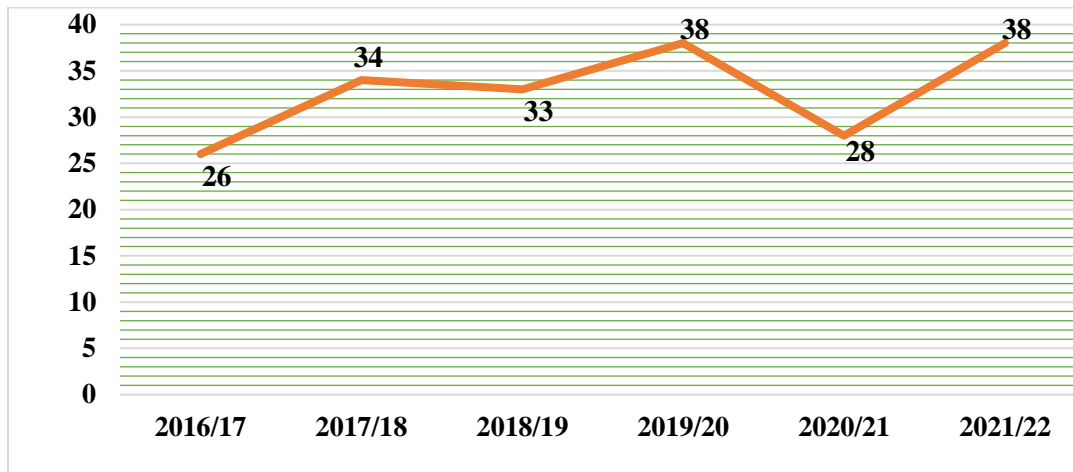


Figure 3: Numbers of milk and milk product processing companies. Source (EMDIDI, 2016/17 to 2021/22)

Types of milk products produced using modern technologies in Ethiopia

Ethiopia expend millions of dollar annually to import milk and milk products from different countries to buffer increasing milk products demand in the country. However, according to former Ethiopia Meat and Dairy Industry development Institute (FMDIDI) 10 years' strategic plan Ethiopia working to substitute imported milk and milk products with home country milk and milk products. Based on this facts, Ethiopia modern dairy processing industries concerned to produce different kind of milk products, as pasteurized milk with high temperature short time and low temperature long time, UHT milk (ultra-heat treatment milk), normal yoghurts, flavored yoghurts, cottage cheese, mozzarella cheese, provolone cheese, cream, table butter, food butter, etc. (EMDIDI, 2020) annual report.

Opportunities of milk and milk products processing in Ethiopia

Yet unexploited abundant resource of cattle in Ethiopia is an opportunities for milk and milk products processing investment. Also there are other opportunities of dairy products processing investment in the country which, huge number of local cattle breed for genetic improvement of milk production, convenient environment for dairy production, recently infrastructural development, increasing of urbanization, increasing of population, better supportive of governmental and non-governmental organization, better awareness creation for quality milk production, recent construction development of milk collection centers, sufficient man power, emerging of milk and milk product processing industries in the country etc.

Constraints of milk and milk products processing in Ethiopia

Although different opportunities of dairy product processing in Ethiopia, however; several constraints contribute for poor quality milk and milk products as well as for low milk product yield. These constraints are, poor raw milk supply chain to dairy processing industries, limited milk collection center, poor hygienic milk production (pre harvesting and post harvesting handling), informal milk marketing, inefficient skilled man power, limited technology, sociocultural factors, lack of coordination of stake holders, limited infrastructure to collect more fresh raw milk on time, milk adulteration, lack of sufficient milk chilling or cooling center etc. Therefore, such factors forced the country to import different milk and milk products from various countries through incurring foreign exchange in millions of dollar annually to satisfy the increasing demands for milk and milk products in the country.

Conclusion

Dairy farming in Ethiopia dependent of indigenous cattle breed with animal having multipurpose which are mostly occupied around rural areas. Dairy products processing in Ethiopia grouped in two as traditional and modern milk processing. Although there is recently emerged dairy and dairy product processing industries in Ethiopia, it is remain under infant development. Modern dairy industries are categorized into three level which are small scale, medium scale and large scale dairy processing industry.

Throughout the country traditional milk processing practice to produce naturally fermented milk, such as traditional butter, butter milk, cottage cheese, whey and ghee. Modern milk and milk products are pasteurized milk with (high temperature short time and low temperature long time), UHT milk, normal yoghurts, flavored yoghurts, cottage cheese, mozzarella cheese, provolone cheese, cream, table butter, food butter, etc.

Urbanization, increasing of population, increasing for dairy products demand, recent attention of government to dairy sector, large population of indigenous cattle resource are opportunity for future milk industry development in Ethiopia. However, poor quality of milk production, low production and productivity of local cattle, informal milk marketing, limited number of dairy processing industries and socio-cultural factors are among dairy industries development constraints in Ethiopia.

Recommendation

- Modern dairy product processing industries should be supported to transforming traditional milk processing techniques Ethiopia.
- Foreign dairy processing investors should be attracted to utilize unexploited cattle resource of Ethiopia wisely.
- Dairy products quality and safety Challenges should be identified and solved through assessment and research.

References

1. [Behnke R., 2010. The Contribution of Livestock to the Economies of IGAD Member States: Study Findings, Application of the Methodology in Ethiopia and Recommendations for Further Work. UK: Odessa Centre, IGAD Livestock Policy Initiative, Great Wolford; 2010. IGAD LPI Working Paper 0210.](#)
2. [Belay Duguma \(2021\). Milk composition, traditional processing, marketing, and consumption among smallholder dairy farmers in selected towns of Jimma Zone, Oromia Regional State, Ethiopia. 10.1002/f sn3 .28 84](#)

3. [Bereda, A. Yilma, Z. and Nurfeta, A. \(2014\) Dairy Production System and Constraints in Ezha Districts of the Gurage Zone, Southern Ethiopia. Global Veterinarian, 12, 181-186.](#)
4. [CSA \(2021\). Central Statistical Agency of the Federal Democratic Republic of Ethiopia Agricultural Sample Survey: Report on Livestock and Livestock Characteristics \(Private Peasant Holdings\). Statistical Bulletin 587 \(II\).](#)
5. [EMDIDI \(2016-2022\). Ethiopia Meat and Dairy industry development Institute annual plan and work achievement report](#)
6. [EMDIDI \(2020\). Ethiopia Meat and Dairy industry development Institute annual plan and work achievement report](#)
7. [FAO \(2014\). Meat Science, Sustainability & Innovation: '60th International Congress of Meat Science and Technology, 98\(3\): 321-568.](#)
8. [FAO \(2018\).ASL2050: Livestock Production System Spotlight Ethiopia Cattle Sector. Rome, Italy: World Food and Agriculture Statistical Pocketbook Forward. J Vet Med Animal Sci. 2021; 4\(2\): 1090.](#)
9. [Girma and Verschuur M \(2014\). Analysis of milk value chain: the case of Ada'a dairy cooperative in Ada'a district, East Shawa zone of Oromia regional state, Ethiopia. Wudpecker Journal of Agricultural Research 3\(1\): 016 – 025](#)
10. [Girma D and Marco V \(2014\) Assessment of factors and factors affecting milk value chain in smallholder dairy farmers: A case study of Ada'a District, East Shawa Zone of Oromia regional State, Ethiopia Vol. 9\(3\), pp. 345-352](#)
11. [Japaro AM \(2021\). Dairy Product Processing and it's marketing in Ethiopia: Current Scenario and Way Forward. J Vet Med Animal Sic; 4\(2\): 1090.](#)
12. [Metaferia, F. Cherenet, T. Gelan, A. Abnet, F. Tesfeye, A. Ali, J.A., Gulilat, W. \(2011\). A Review to Improve Estimation of Livestock Contribution to the National GDP. Ministry of Finance and Economic Development and Ministry of Agriculture. Addia Ababa, Ethiopia.](#)
13. [Van der Valk O, Tessama A \(2010\). The formal dairy chain of Addis Ababa, an analysis of the integration of small -scale dairy farmers in Ethiopian, Addis Ababa. 978-90-86-15436-4](#)
14. [Hailemikael Mossie \(2019\). Review on Traditional Handling, Processing and Marketing of Milk and it's Derivative in Ethiopia. Dairy and Vet Sci J. 13\(5\): 555874](#)



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

[Submit Manuscript](#)

DOI:10.31579/2637-8914/156

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/nutrition-and-food-processing>