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Review Article

Review on Opportunities and Constraints of Dairy Production in Ethiopia

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ABSTRACT

The objective of this paper was to review on opportunities and constraints of dairy production in Ethiopia. Ethiopia is believed to have the largest livestock population in Africa. The total livestock population for the country is estimated to be about70.29 a million cattle population. Despite the huge number of cattle and their dairy industry, the productivity is low due to the constraints of disease, scarcity of feed, inefficient and insufficient AI, veterinary services, infectious diseases, environmental, shortage of feed, and shortage of land. The findings of different authors conducted in different regions indicated that the existence of a large population of dairy cattle and diverse dairy animals' genetic resources, the country's diverse topography, and climatic condition as favorable for dairying. The high potential of smallholder income employment generation is also the key opportunity to dairy production. Therefore, necessary measures have to be taken to reduce identified constraints that hinder the dairy sector's development.

Keywords: Dairy cattle production, constraints, opportunity, Ethiopia

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INTRODUCTION

Ethiopia is known for its highest livestock population in Africa. The estimated domestic livestock population is 70.29 million cattle, 42.9 million sheep, 52.46 million goats, 8.14 million camels, 57 million poultry, 2.14 million horses, 0.38 million mules, and 10.79 million donkeys (CSA,2020/2021). Despite the largest cattle population in Ethiopia, dairy cows' production performance was low. According to Ulfina *et al.*, 2013, Given the considerable potential for smallholder income and employment generation from high-value dairy products in Ethiopia can contribute significantly to poverty alleviation and nutrition in the country. The large cattle population, the suitable climate, and the relatively animal disease-free environment make Ethiopia hold substantial potential for dairy sector development (Zelalem, 2012). Regardless of its potential for dairy development, the productive and reproductive performance of dairy cattle is low due to inadequate and low-quality feed resources, poor nutrition, genotype, and health care management, poor marketing system, insufficient training and extension services (Azage *et al*., 2013). In Ethiopia, such a lower milk production performance is due to reduced lactation length, extended calving interval, late age at first calving, and poor genetic makeup (Azage *et al*., 2010). Zewdie (2010) stated the constraint of dairy production in the country is the lack of both quantity and quality of animal feed, especially during dry season. According to Belay *et al*., (2015) shortage of feeds, livestock disease, poor management practice, poor genetic improvement and lack of organized marketing system are the major constraints that hinder the profitable production of livestock in Ethiopia. There are a lot of constraints hindering dairy production in Ethiopia. Therefore, this paper was aimed to review the opportunities and constraints of dairy production in Ethiopia.

REVIEW

Opportunities of dairy production in Ethiopia

Ethiopia has huge potential for dairy development. According to Tsegay *et al*., (2015) the major opportunity to suitable conditions to improve dairy production and productivity for the future such as marketing accessibility, veterinary and artificial insemination service (AI), and infrastructure. The market opportunity is a key instrument for the dairy industry because all dairy farm items are connected with a market channel for example to rent land for a farm, purchase equipment for housing, labor and to sell milk and milk products, to purchase improved breeds, feeds, AI and drugs (Tsegay *et al*., 2015). According to Eyassu and Reiner (2014), there are high demands for milk, milk consumption tradition of the society, presence of people with different cultural and religious backgrounds in Ethiopia. Asrat *et al*. (2013) reported rapid urbanization, substantial population growth, and change in the living standard of

the dwellers, increasing demand for milk and milk products as major opportunities of the dairy industry in Ethiopia.

Constraints of Dairy Production

Most of the researchers illustrated major constraints of dairy production at a different time in different parts of Ethiopia: inadequate supply of quality feed and its high cost, access to credit, seasonality of demand, particularly in fasting time, and lack of the processing industry (Ahmed *et al*., 2003; Sintayehu *et al*., 2008; Assaminew and Eyassu, 2009; Adebabay, 2009). Shortage of land was reported as the most limiting factor in urban dairy production systems (Belay *et al*., 2011; Azage *et al*., 2013). In Boditti town, South Ethiopia, the dairy production system was challenged by factors like a land shortage, availability and costs of feeds, shortage of genetically improved dairy animals, discouraging seasonal marketing systems, poor animal health services, problems related to waste disposal (for urban producers), poor extension services and knowledge gap regarding improved dairying (Asrat *et al*., 2013). In Mekelle city, the major constraints for dairy development were the shortage of feed, high cost of feed, inadequate land for dairy expansion and preparation of feeds, seasonality of milk demand occurred due to fasting season, lack of improved breed animals with affordable price, less access to credit, AI problem, shortage of water and knowledge gap in identifying quality cross breed cattle (Solomon, 2014). Cattle productivity in Gondar town, North West Ethiopia was affected by various factors and the most important constraints associated with dairy production were a land shortage, feed shortage, disease prevalence, poor government attention, poor veterinary service, lack of improved dairy breed, high cost of feed, water shortage, lack of improved forage pasture and poor transportation (Malede *et al*., 2015).

Feed shortage

Feed shortage in terms of quality and quantity is the major constraint of dairy production in Ethiopia. Feed constraints could be seen from a different dimension in terms of quality and quantity and seasonal feed supply to meet the nutritional requirements of dairy animals. As reported by Azage *et al*. (2013), both roughage and concentrate feeds are either too expensive or unavailable in sufficient quantity and quality to improve dairy production according to Ulfina *et al*., (2013). According to Derese (2008), unavailability of feed probably limits the milk production potential of cows with good milk-producing ability more than any other single factor and is the most serious constraint to improve dairying. According to Tsegay *et al*., (2015), both quantity and quality of feed were the major constraints that accounted for a large proportion in dairy cattle production in the Sidama Zone of Southern Ethiopia. According to Friat and Haben, (2020) low supply and quality of animal feed is one of

the major constraints for livestock development in Welkayt District of Southern Ethiopia.

Shortage of land

According to Azage *et al*. (2013), shortage of land for dairy farming and feed production is a major problem in urban and peri-urban dairy farming system of Shashemene–Dilla milk shed. Dairy farms under this system are under tremendous pressure to expand dairying mainly due to rapid urbanization and population growth. Most urban producers (97%) keep their cattle within their residential compound. Although urban expansion creates a great opportunity for the commercialization of dairy production, it has to be supported with an appropriate policy framework to promote dairy development. Shortage of land is also the major constraint in the rural highland dairy production system. According to Abebe *et al*. (2014), most of the dairy producers were constrained primarily by a shortage of land for grazing and the cultivation of improved forage crops. The problem of feed shortage was associated with small landholdings to produce sufficient quantities and limited knowledge on the conservation of seasonally available feed. MOARD (2007) reported that **g**razing land has declined markedly particularly in the highlands of Ethiopia due to the expansion of crop cultivation. Findings of a study by Friat and Haben, (2020) reported that there was a shortage of grazing land in Welkayt district due to expansion of crop cultivation and urbanization, and to a lesser extent through land degradation.

Genotype related constraints and reproductive wastage

In Ethiopia, indigenous cattle breeds are the dominant source of milk and milk products. The number of crossbred cows is very low and is mainly concentrated in and around major urban and peri-urban centers. Indigenous cattle breeds are generally characterized as multi-purpose animals and managed in a low input production system. These animals have been naturally selected for adaptive and not for functional traits, and they are low milk producers (Azage *et al*., 2013). The genetic make-up of dairy cattle covers about 99% of indigenous cattle populations in Ethiopia that are adapted to feed and water shortages, diseases challenges, and harsh climates. The productivity of indigenous cattle is believed to be poor even if no practical recording scheme has been used to judge their merit (Ahimed *et al*., 2003). The main problem of milk production in the country is that of the poor genetic potential of the indigenous cattle, which gives to low milk output. Crossbreeding has been practiced with encouraging results. However, a strictly controlled breeding program has not been practiced. Milk production is as low as 0.5 to 2 liters per day over a lactation period of 160 to 200 days (Tesfaye, 1990). Improving the feeding, watering, and health care of indigenous cattle did not increase the quantity of milk per day to allow the animals to be used for commercial market milk production (Belachew *et al*., 2003). If

improvement of the local Ethiopian breeds for milk production is targeted, then it is important to have a designed selection program in place for a few selected promising breeds (Ketema, 2000). Most of the smallholder producers rear local breed and this leads them to produce low milk production. Findings of a study by Woldemichael (2008) and Nardos (2010) indicated that low breed performance remains a dominant constraint to small and medium enterprises in Mekelle city.

Poor access to inputs and services

Access to inputs and services include extension, animal health, credit, market information, AI, and dairy inputs. As reported by Sinishaw (2005), AI service in Ethiopia has not been successful to improve the reproductive performance of the country's dairy industry due to the lack of sufficient facilities and trained AI technicians. According to Azage *et al*., (2013), AI service delivery is not as effective and not up to the satisfaction of dairy farmers because the services rendered are very limited, untimely, and irregular.

CONCLUSION

Ethiopia has a huge potential for increasing livestock production for both local use and export purposes. The livestock production is mainly of a smallholder farming system with an animal having multipurpose use. The major constraints that cause to decline in dairy production were: feed shortage**,** land shortage, genotype-related constraints, reproductive wastage**,** insufficient infrastructure, and inadequate artificial insemination services. With the existing constraints, there are many opportunities such as a large number of livestock, the favorable climate, and emerging market opportunity for livestock that assist for dairy development. Thus, this review recommended:

- To mitigate feed shortage through planting improved forage through irrigation and feed storage systems for dry seasons.
- To use AI service to increase milk production by improving the genetic potential of local dairy cattle.
- Either to use modern production system with improved technology or
- To improve the traditional system through feed supplementation and better health care.

CONFLICT OF INTEREST

The Author(s) declare(s) that there is no conflict of interest."

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