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Lidetu Gebreselassie
Department of Animal Science, Raya University, P.O.Box 42, Maichew, Ethiopia

Review on Dairy Production System, Constraints and Opportunities in Ethiopia

Lidetu Gebreselassie

Abstract

The objective of this paper was aimed to compile dairy cattle production system, main constraints and existing opportunities in Ethiopia. Based on their location the main milk production systems are namely as rural milk production, peri-urban and urban milk productions. Ethiopia has potential for dairy cattle production mainly to the reason of suitable environment and high cattle number that contains 59.5 million cattle populations. Even though Ethiopia has large dairy cattle population and favorable climatic conditions, self-sufficiency in milk production is low. The main constraints that affect milk production capacity of dairy cattle in Ethiopia includes feed shortage in terms of quality and quantity, high feed cost, land shortage and space limitation for farming of improved forage, insufficient veterinary services, diseases, water shortage, lack of market information, absence of improved breed in most parts of the country, poor artificial insemination service, lack of milk processing facilities, poor milk production potentials of local dairy cows, poor management of animals, adulteration, waste disposal, lack of market-oriented production. So, to solve the above-mentioned problems, it is very important to introduce improved forage, increase AI utilization efficiency, and improve the current condition of veterinary services. The finding of different authors conducted in different parts of the country indicated that the existence of large population of milk cows and diverse dairy animal's genetic resources, fast growing population, change in living standard and income growth of people, rabid urbanization, growing demand and indigenous knowledge in the preservation of milk and milk products, availability of trained manpower, existence of research institutions and technologies, existence of service providers such as veterinary health and artificial insemination centers, development of infrastructural sector like road access, water supply, communication activities were the key opportunities to dairy production. Generally, the review highlighted that even dairy sector constrained by many factors there are still ample opportunities for dairying. Therefore, coordinated activities must be done by respective bodies to minimize the identified constraints which hinder dairy development.

Keywords: Constraints, Dairy cattle, Production system, Opportunity, Ethiopia.

INTRODUCTION

Ethiopia has the biggest livestock number that estimated 59.5 million cattle, 30.7 million sheep, 30.2 million goats, 8.43 million donkeys, 2.158 million horses, 0.409 million mules, 1.2 million camels, 59.49 million chicken and 5.90 million beehives [1]. Despite of the huge numbers of livestock resource and great potential for increased livestock production, productivity and commercialization of livestock is low [2]. The major constraint for livestock production in Ethiopia is mainly feed availability both in terms of quantity and quality [3]. Other factors are due to constraints of disease, poor management, inadequate animal health services, and poor performance of indigenous breeds [4].

Among livestock production system dairy production is one of the prevalent production systems in Ethiopia [5]. Ethiopia holds large potential for dairy development mainly due to suitable environment [6] and its large cattle population, which comprises 59.5 million cattle populations [1]. Even though there is large dairy cattle population and favorable climatic conditions, self-sufficiency in milk production is low [2, 7]. Accordingly, they contribute an average of 1. 37 liters milk yield per cow per day and annually about 3.1 billion litters with the average lactation period of six months [1].

Crossbred cows produce more milk than local cows due to their genetic potential [8]. However, out of the total dairy cattle keepers in the country 98.2 percent keep on local breed types which are poor genetic potential for milk production. The remaining 1.62 and 0.18 percent are crossbreed and exotic cattle breeds respectively [1]. In addition, obtaining quality feeds is difficult which results low in quantity of milk [2].

Correspondence:
Lidetu Gebreselassie
Department of Animal Science, Raya University, P.O.Box 42, Maichew, Ethiopia
Email: lidetu2001@gmail.com

Cattle are the main source of milk production in Ethiopia [8] and they have their own contribution for family nutrition and income generation [7]. Additionally, less amount of milk also got from goat and camel in pastoralist part of the country [8]. Total annual camel and goat milk production is 997 million liters and 152 million liters respectively [9]. In the lowland pastoral areas, prestige and social security are the predominant factors [10].

Milk and its products market have changed significantly with strong global growth stemming in from the presence of evermore consumers in developing countries [11]. Milk is commonly known as complete nutritional diet owing to its nutritional components such as 87.2 % water, 3.7% fats, 3.5% protein, 4.9% lactose and 0.7% Ash. It is a valuable source of protein, fat, carbohydrates, vitamins and minerals required by humans, especially young ones, for growth and development [12]. However, milk consumption rate in Ethiopia is low level which is 19 lt/capital [13] compared to other countries such as Kenya=90lt/capital and Uganda=50lt/capita l [8]. According to CSA [1] reported that 42.38% used for domestic consumption, 6.12% traded, 0.33% used for wages and the remaining 51.17% used for butter and cheese production from the total annual milk production. Demand is continuously overhead the supply during non-fasting period [14]. According to [15] and [16] reported, there is no well-organized milk marketing system in Nekemte and Bako milk shed, and Dire Dawa.

Dairy production in Ethiopia is facing many difficulties such as shortage of feed at the end of dry, land shortage for establish improved forage, high price of dairy cattle, lack of accurate breeding strategy and regulation, insufficient health related service provision, poor linkage among research, technology users and extension service providers, insufficient training service, milk and milk product marketplace connected problems, genetic limitation or poor fertility rate of some dairy cattle, absence of research, shortage of information conversation organization, lack of education and consultation, socio-economic problems and inadequate access of credit to the dairy cattle keeper [11]. Though there are constraints which hinder the sector there are also many opportunities for its improvement and continuous research are required to challenge problems and sustain dairy development. Therefore, this paper was aimed to review dairy production system, constraints and opportunities in Ethiopia.

Dairy production system in Ethiopia

Dairy production is essentially practiced as an important share of agrarian duty in Ethiopia since ancient period [17]. Based on their location rural milk production, puri-urban and urban milk productions are the three main milk production system classifications in Ethiopia [18].

Rural dairy cattle production

The highest source of milk in Ethiopia is traditional dairy cattle production while cattle are kept for drought power without giving any focus to improve the milk production potential of the dairy cattle and focuses on butter production rather than fluid milk [19]. From the total national milk production, 97 percent comes from rural milk production system which is produced by smallholders. The rural milk production system is highly reliant on the low productivity of the indigenous zebu cattle breeds that can produce 400–680 liters of milk per cow per lactation period [20]. Pastoralists, agro-pastoralists and mixed crop-livestock producers are grouped under the rural dairy cattle production system [21]. The main feed resources for dairy cattle in rural areas are natural pasture, cop residues, crop aftermath or stubble grazing, improved forages with their minimal contribution and beverage by-products that are produced locally such as Diqi or atela [22].

Peri-urban dairy cattle production

The peri-urban dairy cattle production systems are mainly located at the edge of the town areas which have comparatively better access to urban centers in which dairy cattle products are extremely wanted [5]. This production system is categorized as semi-intensive crop-livestock farming system. Most of the dairy cattle producers depend on hybrid cows and they practiced supplementary concentrate feeding. As related to the rural dairy cattle production system, peri-urban dairy cattle production systems is typically located along roads within reasonable distance to urban centers and keepers are involved in fluid milk market [23].

Urban dairy cattle production

In most towns of Ethiopia, the urban dairy cattle production systems are practiced with little or no land resources for the production and sale of milk [5]. It is the most market oriented dairy cattle production system compared to other production systems [24]. Urban areas producers use crossbred, as well as high grade, dairy animals. However, only 1% of the dairy cattle from the total population of dairy cattle of the country are kept under urban dairy cattle production system [11]. Cattle are housed in improved shelters made of locally available materials [25]. Concentrates, roughages and non-conventional feeds are the main feed resources which are used in urban dairy cattle production system. Moreover, road side grazing, fruits of plants and wastes also used in urban dairy cattle production system [24]. Similarly, the study conducted by [26] showed the main feed resources in Dawa chefa districts were grazing land, sun dried hay, agro-industrial oil seed cakes, crop residues and concentrates.

Under the use of intensive management system urban dairy cattle production systems has better access to inputs and services providing by the public and private sectors as compared to other dairy cattle production systems [5, 11]. They have also access to animal health services, use more intensive systems. Milk is sold to consumers and processing plants through informal market. But milk supply is low due small number of dairy cattle population kept under this system [11].

Generally, the urban and peri-urban dairy cattle production systems use improved dairy cattle or hybrid cows with relatively better management, purchased and conserved feed and stall-feeding As a result cows shows the better performance and highly profitable as compared to other systems [19]. According to [27], the average number of hybrid dairy cattle were greater in urban than that of peri-urban dairy cattle production system [28]. Grass hay, crop residues and concentrates were regularly used dairy cattle feeds in both urban and peri-urban areas [29].

It is known that in big towns there is high demand for dairy cattle products consumption and the urban and peri-urban dairy cattle production systems have their own role in filling demand-supply gap for milk and milk products in towns [20]. In addition to this, dairying practice in urban and peri-urban areas increased income [28]. Butter milk, butter and cottage cheese are dairy products which are produced and used as source of income to buy farm inputs [30].

Constraints of milk production in Ethiopia

The constraints of dairy cattle production differ with in the three production systems and among different locations [8]. As indicated by [28] high feed cost, land shortage and space limitation, feed quality, availability and cost problems as well as inadequate extension and veterinary services were the major dairy production system constraints in the Urban and Peri-Urban areas of central Highlands of Ethiopia. This

result was consistent with the finding of [31] who found out feed shortage perceived as the first constraints to dairy farming followed by diseases. Comparable to this result, [6] reported that land shortage, feed shortage, water shortage and poor artificial insemination efficiency (AI) service as the most important dairy production constraints. Similarly, feed shortage and land scarcity, diseases, poor access to market place, restricted market information, lack of improved breed, inadequate artificial insemination (AI) and infrastructure were reported as the primary constraints of dairy cattle production by [32].

The major production problems listed by [14] includes absence of milk processing plants and equipment's, lack of skills, inadequate manufacture space, changeable marketing scheme, shortage of water, poor genetic potential of dairy cows for milk production. Comparable to this, feed shortage, inappropriate heat detection activity, poor management of animals, high service charge for artificial insemination and long distance from artificial insemination center are mentioned as main problems of artificial insemination services [33].

Feed and water scarcity, shortage of land, high feed cost, contamination and waste disposal are listed as the most challenges for dairy production in and around Wolaita Sodo town, southern Ethiopia [24]. According to [34] study showed that high cost of shortage of cattle feed inadequate water supply, space limitations and diseases were identified as the main constraints of dairy cattle production in Bishoftu and Akaki. Moreover, [8] identified lack of market-oriented production, non-existence of transport, insufficient infrastructure facility and institutional arrangements, disease; illegal trade and poor market data were the major reasons for the poor performance of dairy sector. A recent study by [35] described that dystocia, repeat breeder, retained fetal membrane, abortion; metritis, anestrous and uterine and vaginal prolapse are major responsible factors for the low reproductive performance of dairy cows.

Opportunities of milk production in Ethiopia

The large population of milk cows, diverse genetic resource of dairy cattle adapted to the varied environment, and different agro-ecological zone, presence of potential land for manufacturing of quality feeds under rain season and irrigated environments are opportunities for milk producers to increase milk production [5, 8].

The existence of fast growing population and urbanization with an extended utilization of milk and its products are the main opportunities of milk production in Ethiopia [8]. This is agreed with the result of [36] indicated that fast urbanization, increase population number and modification in economic standard of the individuals, dairying gives an opportunity to the dairy producers to generate income as it is highly demanded product. The growing demand for milk and its products like fermented milk (Yogurt), butter, cottage cheese, butter milk, ghee and whey offers a good opportunity for dairy producers [24]. Hence a potentially large domestic market is the main opportunities of milk production in Ethiopia [8]. The existence of diverse agro ecologies coupled with diverse flora species rendered in the different parts of the country to have native knowledge in the conservation of milk and its products in the dairy farming system using various sources of herbs [37].

There are plenty of opportunities for dairy development listed by [17] and [29].were high demand for milk and its products consumption, enormous humanoid population with long lasting custom of utilization of milk and its products, fast rate of migration from rural to urban areas and revenue growing, accessibility of skilled manpower, the existence of research center organizations and technologies, existence of service providers such as veterinary health and artificial insemination (AI) centers, and employment creation. On the other hand, development of infrastructural sector, such road access or road construction to connect towns with kebeles, water supply, electrification, communication activities would favor modern dairying [32].

CONCLUSION

The objective of the current paper was to reviewed milk production system, major constraints and opportunities for dairy production in Ethiopia. Generally, from the current review feed shortage in terms of quality and quantity, high feed cost, land shortage and space limitation, inadequate extension and veterinary services, diseases, water shortage, convenience to marketing place, poor market data (internal and external), absence of better quality breed, insufficient infrastructure and inadequate artificial insemination (AI) services, poor management of animals, lack of market-oriented production were the primary as constraints of dairy production. With the existing bottleneck problems there are many opportunities for dairy development in Ethiopia. Therefore, coordinated efforts are necessary to address the identified constraints across the different dairy production systems.

Recommendations

- Feed availability is low both in quality and quantity hence strong extension work on use of concentrate feed, grazing land management system, and development and utilization of improved forage is very important.
- Disease are among the major constraints; therefore, dairy owners should be trained with hygienic procedures of milking and milk processing as well as equipment's used to reduce the risk of disease occurrence is due to poor hygiene.

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