Journal of Genetic and Environmental Resources Conservation, 2017, 5(2):84-95.
www.jgerc.com Print ISSN: 2306-8663, Online ISSN: 2306 – 8280

Review on the status of dairy cattle production in Ethiopia

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Abstract

In Ethiopia the dairy industry plays an enormous role in ensuring food security and creating rural employment in the highlands and lowland areas. In 2013 the annual milk production was estimated to be 3.8 billion liters from cattle and 165 million liters from camel. From this, the total production of cow milk holds 4.06 billion liters and the average daily milk production/cow of 1.86 litres/day. However, Milk yield per day per cow remains to be low for indigenous dairy cattle compared to cross bred in different part of the country. According to different studies, there was 1.0. l, 2.07, 1.5 l, 1.5, 1.5, 2, 3.3, 2.2, 2, 1.9, 2.8, 2.2 in Gambela, Sidama, Mekele, Bahir Dar, Diredawa and Harar, Ambo, Bedele, Jimma, Metu, Nakemte, Dembi Dolo, respectively. On the other hand, cross bred dairy cows provided considerable amount of milk in different areas. According to the studies conducted by different researchers, there was 11.6, 10.8, 7.1, 15, 7.5, 7.8, 4, and 9.3 in Bishoftu, Akaki, Bahir Dar, Diredawa, Harar, Ambo, Bedele and Jimma, respectively. Cross breeding program had significantly improved the genetic level of an overwhelming majority of indegiounous dairy cattle. Aside from the genetics, the milk yield is constrained by shortage of feed availability, water and lack of improved herd management. Therefore, improvement on the genetic makeup of dairy cattle should be complemented with provision of improved forage crops, supplementation of concentrate, adequate veterinary services and improved herd management.

Keywords: Indigenous, Crossbred, Dairy cattle, Milk yield.

Introduction

Ethiopia has the largest livestock production in Africa comprising about 55.03 million in 2013. Out of this total cattle population, the female cattle constitute about 55.38% and the remaining 44.62% were male cattle, from this 6,675,466 and 10,731,656 were dairy and milking cows, respectively (CSA, 2014). The sector holds its share from 15 to 17% of gross domestic product (GDP) and 35 to 49% of agricultural GDP and 37 to 87% of household incomes (Behnke and Metaferia, 2011). Livestock remains to be a major national resource and form an interconnected chain in the mixed crop-livestock production system (Gebrewold *et al.*, 2000). Cows contribute to about 95% of the total annual milk produced compared to other livestock species and the remaining 5 % comes from camels from the pastoralist areas (CSA, 2010). Around 99.19 percent are indigenous breeds while the hybrids and pure exotic breeds accounted 0.72 and 0.09 percent, respectively. From the total cattle population, 45.13 percent are males and 54.87 percent females. Livestock production is an integral part of Ethiopian agricultural system and the sub-sector contributes about 12-16% of the total GDP and 30-35% of total agricultural GDP (Halderman, 2004). Of this, the dairy industry is highly significant and it plays a great role in creating rural employment in highlands and pastoral/agro-pastoral areas (livestock Cooperative Agreement, 2010). Livestock provides an enormous service in the Ethiopian household economy by providing food, input for crop production and soil fertility management, cash income as well as in promoting savings, fuel, social functions, and employments. With this wide array of functions, livestock can be considered as a vehicle for improving food security and better livelihood of the rural population. (Land O'Lakes, Inc., 2010).The huge and diverse cattle population, varied and favorable agro-ecology for dairying, increasing demand for dairy products in urban and peri-urban areas, long-standing culture of dairy products consumption, and favorable policies are indicators of the importance and potential of dairying in the country (Tegegne *et al.,* 2013). Indigenous breed of cows are very poor in terms of milk production. However, they are the major source of milk in Ethiopia that account for

97% of the total milk production in the country (CSA, 2008). Ruminant animals are major segments of the agricultural systems in the tropics. In smallholder systems, livestock play a significant role in terms of bringing direct cash income, capital assets, produce manure which is used as fertilizer and fuel; source of power for transport and cultivation (Tsehay, 2002). Despite its large number, the livestock sub-sector in Ethiopia is not as productive as developed world. Compared to its size and potential, the direct contribution to the national economy is limited. Low productivity of indigenous livestock is attributed to poor genetic potential for productive traits, poor quality and quantity of feeding, health care and management (Zegeye, 2003). Dairy production is a physiological system that converts large quantities of roughage to milk and then to most nutritious food for man (De Leeuw*et al.,* 1999). According to (Yitaye *et al.,* 2007) and (Staal, 2002), as dairying play significant role in the life's of all stage, proper policy frame work implementation of the dairy sector can contribute significantly to poverty alleviation as well as, availability of food, income generation and employment generation.

Taking into account the ever rising human population growth rate of about 2.9% per annum and the likely hood of increasing demand for dairy products especially in the urban areas, milk production should be growing in Ethiopia at a rate of 3.8-4% annually until 2020 (Holloway *et al.*, 2000).It is obvious that Milk is one of the most important diet items of many people meeting the nutritional requirement of wide range of people. Milk has been defined as the most nearly ''perfect food". It is a compensatory and an integral part of daily diet especially for the expectant mothers as well as growing children (Javaid *et al.,* 2009; Olatunji *et al.,* 2012).The annual milk production in Ethiopia is estimated to be 3.8 billion liters from cattle and 165 million liters from camel (CSA, 2013). From this, the total production of cow milk holds about 4.06 billion liters and the average daily milk production/cow of 1.86 litres/day (CSA, 2010/11). However, the per capita milk consumption was estimated to be 19.2 kg total (MoA, 2012). Further, the annual rate of increase in milk yield estimated to be 1.2% for indigenous stock and 3.5% for improved stock which lags behind the increment of human population (estimated to be about 2.7% perannum) (CSA, 2008; Tsehay 2002).

Average milk production per herd is considered as one important measure of dairy performance which is influenced by many factors including genetics, nutrition, environment and management. In Ethiopia, Large segment of livestock production sub-sector except few dairy farmshave been managed under extensive traditional grazing system (Yilma et al., 2011). Small scale farmers in rural area keep indigenous animals which are genetically low milk and meatproducers while few dairy farms in urban and peri urban area have been keeping cross breeds. Review of (Winter LM, 2002).

Crossbreeding with European dairy breeds has been undertaken since long time to improve milk production potential in tropical cattle. The first crossbred generation (F1), derived from indigenous (usually Bosindicus) females mated with exotic (Bostaurus) bulls proved to be performing very well in almost all cases. However, further upgrading by repeated backcrossing to the exotic breed didn't bring improvement (SYRSTAD, 1996). REGE (1998).

Crossbreeding experiments involving European and indigenous breeds in the tropics and estimated high heterotic contributions to milk production traits in the F1 cows, and a significant deterioration in the performance of the F2 generations in all traits compared with the F1 generation. The objective of this review is to uncover the existing information related to the current status of dairy cattle production in Ethiopia.

Dairy cattle distribution in Ethiopia: The distribution of different milk producing livestock species differs from one region to another. The total cattle population as well as milking cows is highest in the Oromia Region, estimated to be about 22.5 million (45.6 percent), of the total national population and the three regions (Oromia, Amhara and SNNP) put together accounting for 89.94 percent of the total cattle population and 89.55 percent of the total number of milking cows in the country (Yilma*et* al., 2011).

Milk production system in Ethiopia: Different species of livestock have been reared in all of the production systems of Ethiopia by pastoralists, agro pastoralists, and crop/livestock farmers (Ahmed *et al.,* 2003). Based on climate, land holdings and integration with crop as criterion, dairy production systems are classified into three main systems :(1) rural, (2) peri-urban and urban and (3) commercial dairy systems. The rural dairy small-holder system produces the largest share of total milk produced, contributing 98% of the milk supply (SNVNDO, 2008, Land O'Lakes Inc, 2010).

Table (1): Dairy cattle population and distribution in 2010

Region	Total Cattle in "000"	Milking cows in "000"	% of Milking cows
Oromia	22 475	4 395	19.6
Harari	45.4	11	24.2
Dire Dawa	46.7	10.7	22.9
Somali	591	139	23.5
Afar	500	128	25.6
Amhara	12 747	2 151	16.9
Gambela	221	38	17.2
Benishangul-Gumuz	422	86	20.4
SNNP	10 543	2076	19.7
Tigray	3 243	593	18.3
Total	50 884	9628	20.83

Source: Yilma *et al.,* 2011. NB: A CSA annual report on livestock production doesn't include urban, peri-urban areas and regional capitals.

Rural dairy production system: Majority of livestock keepers rely on rural dairy system which is part of the subsistence farming system that contribute up to 98% of the total milk production of in Ethiopia and includes pastoralists, agro-pastoralists, and mixed crop–livestock producers (Ketema, 2000; Tsehay, 2002; Yosephe*t al*., 2003; Zegeye, 2003; Derejee*t al*., 2005).The system is not commercial based and most of the milk produced in this system is left for home consumption (Ahmed *et al.,* 2003).

In the highlands of Ethiopia, small scale farmers keep mostly zebu cattle which have lower milk production ranging from 400 to 600 lit for a two hundred day lactation period (2 – 3 lit/day/head) and well suited to the existing environment(Land O'Lakes, Inc.2010). Livestock are subjected to graze on communal pastures although a considerable amount of fodder production for both on-farm use and sale is increasing using bulls as common for breeding purposes except near to national artificial insemination center. Subsequently, due to crossbreeding program has been underway in the country the government is delivering semen for AI services at subsidized cost for milk production increment.

Pastoral milk production system: Pastoral milk production system is one of the major systems of milk production; being given less attention has been practiced in the lowland region of Ethiopia where the livelihood security of the semi-nomadic transhumance population relies on their stock. Milk production in this system is very low and seasonal variable due to environmental factors (Zegeye, 2003). Pastoralism is the major system of milk production and plays a great role in the livelihoods of pastoralist community in the lowland part of Ethiopia. It is estimated that about 30% of the livestock population are found in the pastoral areas contributing its fair share to the total livestock population of Ethiopia.Nevertheless, because of limited rainfall that leads to shortage of feed availability, milk production becomes low and highly seasonal. (SNVNDO, 2008)

Natural pasture is the sole source of feed obtained from non-arable rain fed lands to ensure Livestock and milk production in pastoral areas. Due to seasonal change, a majority of the stock is moved to follow water and pasture resources. When animals are back to home, crop residues (sorghum and maize thinning and Stover), and household waste are an important feed resources for livestock (Land O'Lakes, Inc.2010).

The highland mixed farming milk production system: The highland mixed farming milk production is an integrated crop-livestock husbandry system from which the milk produced accounts for the major part of the 97% out of the total milk the country produces. The highland livestock, as does in the lowland, dominated by cattle constituting 72.4% of the total TLU. From this only 28% are cows of which 40-45% is milked each year (Felekeand Geda, 2001).The highland smallholder milk production is found in the central part of Ethiopia, where dairying is nearly always part of the subsistence, smallholder mixed crop and livestock farming (Zegeye, 2003).

Peri-urban and urban milk production system: Peri-urban milk productionhas been performed in areas where the population becomes high and the agricultural land is scarse due to urbanization around major cities like Addis Ababa and other regional

towns (Tsehay, 2001).This production system is now becoming prominent in the highlands among mixed crop-livestock farmers (Gebrewold*et al*., 2000). Dairy farmers and cooperatives involved in milk production in the peri-urban and urban areas are selling milk to consumer in the nearby town and city. Dairy Producers in this production system have a better understanding of dairy management, processing facilities, better genetics (50 – 62.5% crosses) with experience of receiving AI services.(Land O'Lakes, Inc.2010).

Urban dairy farmingis a highly specialized dairy farming owned by state or businessmen and is mainly concentrated in major cities of the country. Pure exotic and cross bred cows have been used in this production system comprising 40,000 pure exotic and crossbred cows in urban and peri urban areas of the country. In Addis Ababa alone, there are about 5200 dairy farms with some 58,500 cattle (almost 50 percent crossbred). Total annual milk production from 5200 dairy farms is estimated to be 44 million liters from which 83% is marketed, while the rest is used for household consumption (Azage, 2004). However, the number of smallholder and commercial dairy farms are limited to be emerging mainly in the urban and peri-urban areas of the capital (Felleke and Geda, 2001; Azage, 2003) and most regional towns and districts (Nigussie, 2006).

Commercial Milk Production: A majority of the pure exotic animals are limited to commercial or government farms; within the Greater Addis milk shed (there are 269 commercial dairy farms with 10 or more mature cows)(Land O'Lakes, Inc.2010).

Dairy Producers would rely almost exclusively on AI for good semen and keep breeding records with paying for the more expensive imported genetics and breeding supplies (SNV, 2008). In around Addis Ababa there are an estimated 5,000 dairy producers with pure and cross-bred cows producing 34 million lit per year (Azage, 2002).

Table (2): Dairy production potential in relation to production system around Gondar

Dairy production system	Lactation length (days) Mean+S.E	Lactation milk yield (litres) Mean S.E	Peak yield (litres) Mean S.E
Mixed farming	274.22+79.43	1403.44+65.87 ^{c}	6.92+0.36^{c}
Peri-urban	271.58+60.32	1352.12+69.87^{b}	6.54+0.44^{b}
Urban	281.61+68.22	1464.65+78.34 ^{a}	7.34+0.35^{a}

Source: Kumar Niraj*et al*., 2014

According to Kumar Niraj.*et al*., 2014, the production system influenced the production potential of dairy cattle in the study area. There was a significant difference in terms of total milk yield and peak milk yield being produced in the three production system having the highest milk yield of 1403.44, 1464.65 and 1352.12l/lactation lengths with peak milk yield of 7.34, 692 and 6.54 liters in urban followed by mixed farming and Peri-urban respectively.However, the lactation lengths between farming system were not affected by production system which might be attributed to genetic factor of the animal.

Reproductive performance of dairy cattle in Ethiopia: Reproductive performance traits like age at first service (AFS), Age at first calving, number of services per conception (NSC), days open (DO) and calving interval (CI) are the basis for commercial profitable dairy farming (MukasaMugerewa, 1989). However, the environmental factors, including management conditions, play an enormous role in the expression of traits due low heritability nature of the traits (Olori et al., 2002). The reproductive performance of the breeding female is probably the single most important factor that is a prerequisite for sustainable dairy production system and herd replacement (Kiwuwa et al., 1983).

According to different authors indifferent parts of the countries, the reproductive performance of both indigenous and crossbred cow were affected by genetic and environmental factors (managements). However, number of service per conception was affected mostly by management factors including the skills of inseminator and availability of equipment's. The longest age at first service for female Indigenous cattle was recorded in Haramaya and Sidama with about 34.4±2.28 and 44.1±5.9 month, respectively and with a shortest for HF crossbred animal with the record of 18.7±3.5 and 24.9± 3.9 month around Akaki and Asella town, respectively. Similarly, AFC and CI were also affected by genetic and non-genetic factors.

Table (3): Reproductive performance of dairy cattle in different parts of the country

Location /place	Breed	Performance parameters				
		AFS in month	AFC in month	CI in month	NSPC	Reference
Sidama	Indigenous	44.1±5.9 (F) 42.2±4.4 (M)	51.9±5.9	23.6±4.4	2.4	DebirLegesse Belay(2016)
	Crossbred	30.3± 4.4 (F) 27.3± 3.98 (M)	39.3±3.2	17.1±4.5	1.8	
Asella town	HF×Zebu	24.9± 3.9 (F)	34.8±4			Hunduma(2012)
Jimma Town	HF×Zebu	24.3± 8 (F)	36.5± 1.64	21.36±3.84	1.56±0.57	Belay et al.(2012)
Gondar Town	HF×Zebu	23.2± 0.8 (F)	32.4±0.7	21.5 ±8.5	2±1	Nuraddis et al.(2011),nibret(2012)
Mid –rift valley	HF×Zebu	20.6± 3.8(F)				Chalchisa et al.(2014)
Bishoftu	Cross bred	18.7±3.7	26.9±5.4	13.0±2.1		DessalegnGenzebu et al, 2016
Akaki	Cross bred	18.7±3.5	27.0±3.7	13.8±1.9		
Haramaya university	Ogaden (Zebu)	34.4±2.28	49.2±4.43	492.86±13.23 (days)		GetinetMekuriaw, et al. 2009

Note: AFS=age at first service, AFC= age at first calving, CI= calving interval and NSPC= number of service per conception, M= male and F= female.

Utilization of exotic blood level reduced age at first calving ranging from 26.9±5.4 to 39.3±3.25 in month for crossbred animal in Bishoftu and Sidama, respectively. Concomitantly, the CI has been reduced for crossbred animal ranging from 13.0±2.1to 21.5 ±8.5 in Bishoftu and Jimma Town, respectively.

Dairy cattle milk production trends: The number of milking cows at national level varied during the 15 years reference period (1996 to 2010). Fortunately, this number continued to increase from about 8.8 million in 1996 to 11 million in 2001 and roughly decreased to 7.9 million in 2003 then increased again to 9.6 million in 2010. Milk production, however, increased steadily from about 927 million liters in 1996 to 2.9 billion liters in 2010 (31.5 percent increase as reviewed by Yilma et al., 2011 and FAO (2010).

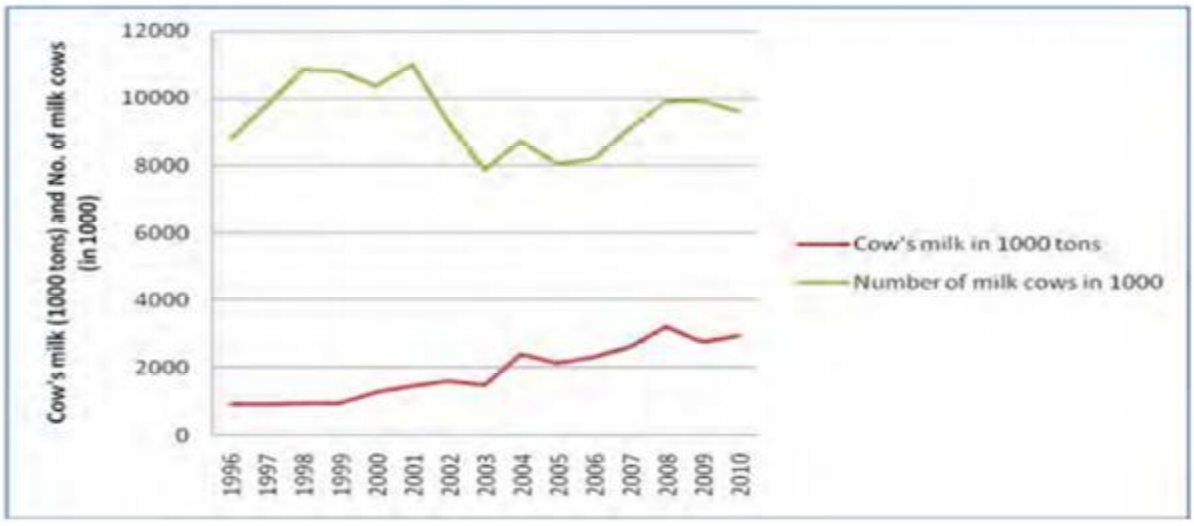

Figure1. Milk production trend over fifteen years
Source: Review of Yilma et al., (2011)

Milk yield and lactation length in parts of the countries: According to the study conducted by Mulugeta and Belayneh (2013) in North Shewa, the difference in milk production between indigenous and their 50% cross breeds had steep slope that indicates 50% cross breeds produce more amount of milk(1511.5 L) than local breeds (457.89 L) per lactation. Similarly, Kumar Nirajet al., 2014 in their study conducted in Gondar area revealed that the overall least squares means for total milk yield per head in HF crossbred and indigenous cows were 2123.43±65.67 and403.21±90.34, respectively. The high level of milk production obtained from HF crossbred cows could be due to complementary or heterotic effect accompanied with management. On contrary, Mohamed et al., 2001 suggested that as blood level increased, reduction in the performance of milk production would decrease which is attributed to reduction of epistasis effect. However, 50 % of HF cross bred animal is more preferred under extensive production system. For instance, 50% HF crossbred cows had significantly higher average length of milk yield (2123.43 +65.67 liters) than that of indigenous cows (403.21+ 90.34 liters) in Gondar (Kumar Nirajet al., 2014).

In the study performed by UrgesaYohannes. 2015, the overall average daily milk yield per cow was 2.08 litre/day in around Borana and the milking operation in the study area is undertaken within a week after calving (94.4%) and the remaining 5.6% of farmers start milking after a month. The low milk production could also be due to a number of factor including lack of proper supplementary feeding of the dairy cattle, poor nutritive value of pastures and forages offered to the animals and lack of dairy husbandry training to boost productivity.

Similarly, according to the study conducted by Gatwech tang dup., 2012 in Gambella region, the estimated average milk yield per head per day in the surveyed areas was 1.62± 0.07 liters and the lactation yield was 355 liters over an average lactation period of about seven and half months (7.30± 0.06 months). Belay Duguma. 2012, in his study revealed that Milk Yield/ Lactation and Lactation Length for Holstein- Friesian x Zebu crossbred animals were 2333.63l and 9.13±1.99 months, respectively in Jimma town. Concomitantly, Tsegay., 2015 reported an average 1.5 liter milk per day was obtained from each dairy cows in Sidama Zone compared to 1.85 liters as far as Ethiopia is concerned(CSA, 2011). In Bishoftu there were 3208.56±108.81 of total milk yield per head and 276.6±35.1lactation length per one lactation period while in Akaki, there was 3031.56±46.3 of total milk yield and 280.7±19.3 lactation length per one lactation period(DessalegnGenzebu et al, 2016). Milk yield per day per cow remains to be low for indigenous dairy cattle compared to cross bred animals. According to different studies, there was 1.0. l in Arsi as reported byLemma (2005), 2.07 l in Gambela as reported by(CSA, 2008), 1.5 l in Sidama as reported by Tsegay, 2015, 1.5 in Mekele, 1.5 in Bahir Dar, 2 in Diredawa and Harar as reported by FAO(2011), 3.3 in Ambo, 2.2 in Bedele, 2 in Jimma, 1.9 in Metu, 2.8 in Nakemte, 2.2 in DembiDolo as reported by UlfinaGalmessa et al,2013 for indigenous dairy cows. The low productivity of indigenous dairy cow is associated to genetic and environmental factors in the studied areas. On the other hand, cross bred dairy cows provided considerable amount of milk compared to indigenous dairy cow in different areas of Ethiopia. In the studies performed by different researchers, there were 11.6 and 10.8 in Bishoftu and Akaki, respectively as reported by DessalegnGenzebu et al, 2016, 7.1, 15 and 7.5 in Bahir Dar, Diredawa and Harar, respectively as reported by FAO (2011), 7.8, 4 and 9.3 in Ambo, Bedele and Jimma, respectively as reported byUlfinaGalmessa et al, 2013.

Milk production opportunities in Ethiopia: The dairy industry contributes to the rural livelihood of Ethiopia and it is potentially the largest rural employer in the Ethiopian highlands and pastoral/ agro-pastoral areas. Due to expansion of urbanization, growing population size, there is huge demand for milk by the children and younger generation relying on dairy industry to narrow down the gap between demand for milk and supply. Moreover, the dairy industry has further potential to contribute significantly towards increased income and employment. The ultimate goal of the intervention in the dairy industry in general and Milk Value Chain in particular is to increase rural incomes by increasing the number of rural households deriving their livelihood from dairy business through managing high productivity enterprises, while delivering quality and affordable dairy products to the market (SNV, 2008).

Table (4): Dairy cattle productivity in different areas of the country

Place/Location	Breed/class	Herd size	MY/day/Cow	TMY l/head	LL in day/month	Reference
Arsi	Arsi breed		1.0. l			Lemma (2005)
Gondar	HF crossbred			2123.43± 65.67	325.12+61.28	Kumar Niraj.*et al*.,2014
	Indigenous			403.21± 90.34	204.33+70.35	Kumar Niraj.*et al*.,2014
Gambella	Indigenous		2.07 l		210	(CSA, 2008)
Bishoftu	HF crossbred		11.6±3.1	3208.56±108 .81	276.6±35.1	DessalegnGenzebu et al, 2016
Akaki	HF crossbred		10.8±2.4	3031.56±46. 3	280.7±19.3	
Bahr dar	Indigenous	1172	1.5	348000		
	Crossbred	803	7.1	2081000		
Dire dawa	Indigenous	37129	2	8911000		
	Crossbred	730	15	1643000		
Harar	Indigenous	11833	2	4261000		
	Crossbred	365	7.5	575000		
Ambo	Local	2.9±1.1	3.3± 0.51		8.7 ± 1.0	UlfinaGalmessa et al,2013
	Crossbred	2.2± 1.4	7.8 ±1.0		9.9 ± 1.0	
Beddelle	Local	12.1± 1.3	2.2± 0.5		7.5± 0.9	
	Crossbred	4.1 ± 1.6	4.0 ±1.5		9.8 ±1.8	
Jimma	Local	1.8 ±1.3	2± 0.6		9.5± 1.2	
	Crossbred	13.4± 1.3	9.3 ± 0.9		10. ±21.0	
Mattu	Local	5.9±1.1	1.9 ± 0.4		7.5 ± 0.7	
	Crossbred	0.4 ±1.4	5.0± 2.3		13.0± 3.6	
Naqamte	Local	4.8 ±0.9	2.8 ± 0.3		8.8 0.7	
	Crossbred	3.3 ±1.1	6.9 0.8		10. ± 6 0.9	
DambiDollo	Local	6.6 ±1	2.2± 0.4		9.6 ±1.0	
	Crossbred	2.0 ±1.3	6.8 ± 0.7		11.1±1.4	

Note: AFS=age at first service, AFC= age at first calving, CI= calving interval and NSPC= number of service per conception, M= male and F= female.

Existing opportunities: At production level, there are various opportunities in Ethiopian dairy sector including the need to organize farmers for better land utilization and fodder production, enhance feed access and distribution, planting perennial drought resistant fodders and promoting home-grown feeds. At the production stage, private sector partnerships and strategic alliances offer opportunities to grow sustainable dairy enterprises. Other emerging investment opportunities at the production level include equipment supply and leasing, farm input supplies via organized check-off systems for groups of large farmers, milk testing and recording services, transport services and private extension services. At the farm level, investment potential lies in medium and large dairy farming but also there is potential in food processing and provision of advisory services including breeding technologies. There is opportunities to invest in dairy feed processing and feed technologies (SNV, 2008).

Availability commercialization areas in Ethiopia: The milk shed districts in the different zonal and regional states of the country are suitable for market-oriented milk-production systems (MoARD, 2005). The major milk shed areas to a very large extent fall within the central highlands of the country where the milk consumption and demand is higher due to higher population density and size compared to other ecological zones. In the highland zones, milk production is given priority over other livestock production systems due to ecological conditions and the population pressure that favors dairy production and the existence of neighboring arid areas with a comparative advantage for specialization in beef-production.

Table (5): Milk shed region of Ethiopia

Oromia	Semen, West, South West and East Shoa, East Wollega, East and West Hararghe, Arsi, Bale and Jimma	Reference
Amhara	Eastern Zone, West, South and North Gondar, South and North Wollo	SNV,2008
SNNP	Sidamawolayta, Hadiya, kembata, Timb, Guraghe, Gedeo, Kefa and Bench majj	
Tigray	Central, Eastern, Southern and Western	

Opportunity in New products: The dairy industry has a number of specific features that distinguish it from the other agricultural industries (Bulkiness and perishability) Therefore, milk requires timely management and implies high transportation and transaction costs. This makes milk a very valuable but at the same time extremely expensive raw material. In many developing countries manufacturers have foundstrong incentives to diversify and extend products' shelf-life (UHT milk is the most successful example), so as to promote consumption across all the highly variegated segments of the society (Euro Monitor International, 2004).Development of successful and sustainable dairy industry will be realized by strategic interventions of the investors in to all parts of possible entry points along the milk value chain especially on the innovation of new products. Accordingly, several entry points to produce new products are identified as intervention opportunity in the dairy industry value chain with varied degree of resource requirement and level of competitions. (SNV, 2008)

New technologies: Introduction of new technologies into dairy industry create opportunities that offer attractive potential benefits to prospective investors. With the exception of powder milk, which is widely popular in theurban areas, all industrial products (i.e. products that cannot be made using traditional technology, require mechanization), such as standardized, homogenized, sanitized (undergone some type of heat treatment) and packed milk, butter, cheese (cottage cheese excluded) and yogurt requires new technologies and are potential entry points mainly to major urban markets. (SNV, 2008).

CONSTRAINTS OF DAIRY PRODUCTION: According to study of Niraj Kumar[1]et al, 2014 around Mekelle,Constraints are the circumstances or the causes which prohibit the

dairy farmers from adoption of the improved management practices and categorized as Feeds and Feeding, Breeding, Veterinary / Health care service, financial problem and Marketing problems were identified with varying degrees. Consequently, according to Mekuria S (2016), Constraint like lack of plot for forage development in household, poor feeding, housing and health management was observed in Hawasa and Derw-Brahan cities.According to study of (UrgesaYohannes, 2015)in borana, the low production could be due to a number of factor including lack of proper supplementary feeding of the dairy cattle, poor nutritive value of pastures and forages offered to the animals and lack of dairy husbandry training to boost productivity.

The principal constraints of dairy industries in Ethiopia were categorized to technical, institutional, and socio-economic in nature.

Technical Constraints: Genetic limitation for Milk Production, Inadequate Feed-Resources which is poor pasture development,Absence of Effective Breeding Programsand Animal Disease

Institutional Constraints: Lack of Breeding Policy, Weak Linkage between Research, Extension, and Technology Users, Inadequate Extension and Training Service, Unreliable Milk Market &Unavailability of Credit to the Dairy Farmer

Socio-economic Constraints: Unavailability of Land for growing of forages, the land policy to assist the development of the dairy sector, Poor infrastructure and lack of proper milk transport facilities

CONCLUSIONAND RECOMMENDATION: Dairy production was found to be an important enterprise and have the potential to be economically viable and greatly contribute to poverty alleviation, food security, improved family nutrition and income and employment generation. However, shortage as well as high cost of feed, occurrence of disease, expensive veterinary services, lack of timely AI, financial and marketing problems were the main constraints limiting dairy production in the Ethiopia. More milk was produced per household day by urban than by mixed crop-livestock producers.

The low production of milk could be due to a number of factor including lack of proper supplementary feeding of the dairy cattle, poor nutritive value of pastures and forages offered to the animals and lack of dairy husbandry training to boost productivity. Consequently, Poor management was the most probable factors affecting the reproductive and production performance of cross breed cattle in the different parts the countries.

Because of differences between the production systems, including climatic factors and feed supply, the performance of the animals resulting from cross-breeding programs being substantially behind expected in different parts of the country. Raising the genetic potential of local breeds to achieve significantly higher milk production through crossbreeding with exotic dairy breeds and synchronization are recommended in areas of suitable environmental condition (feed availability and climate condition). Level of management achievable in Ethiopia is unfavorable to higher exotic inheritance levels than 50% Holstein Friesian inheritance. So that, management practice should be strictly considered while increasing of local breed's blood level for milk production. Feed and feed related challenges in dairy production should be addressed through establishment of forage seed industry, forage development strategies and policy intervention for land availability and forage seed disseminations.

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