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Study on Dairy Production System and Its Constraints in Gimbi District, West Wollega Zone, Oromia, Ethiopia

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Abstract: This cross sectional study was conducted to study dairy production system and to identify its major constraints in Gimbi District, West Wollega Zone. The study area was purposively selected due to high demand for milk and milk products, the socio-economy of the society was highly relay on crop-livestock production and marginality of the district to most technological interventions. Multistage sampling technique was used to determine sample size and District, kebeles and dairy owners were sampled sequentially. Data were collected by formal interview using semi-structured questionnaire and supported by field visits. The collected data were analyzed by SPSS software version 20.0. Crop-livestock production and peri-urban dairy production systems were identified. In the study area, 99.89% of cattle were local breeds while 0.11% was Holstein Friesian crossbreds. Natural pasture, crop residues, stubble grazing and local beverage by-products (atela) were the major feed resources in the study area. However, there was no appropriate utilization of crop residues and hay making practice. The drinking water sources were entirely rivers. Housing system was mainly traditional and unimproved where dairy cows kept during the night in earthen floor housing locally known as "*Dallaa*". The average milk yield/cow/day from local and crossbred were 1.18 ± 0.52 and 5.83 ± 0.18 litters, respectively. The major constraints of dairy production system were poor feed conservation practice and feed shortage, poor access to veterinary services, lack of improved breeds and lack of credit service. Extension intervention should focus on a planned technical and institutional interference on provision of adequate veterinary health services, improvement and expansion of crossbred dairy cattle in the area and grant credit services for dairy producers in collaboration with micro-financial institutions to enhance dairy production and thereby improve the livelihood of the livestock keepers.

Key words: Constraint · Dairy Cattle · Gimbi District · Production

INTRODUCTION

Ethiopia is believed to have the largest livestock population in Africa. Its livestock population is estimated to be 59.5 million cattle, 30.70 million sheep, 30.20 million goats, 2.16 million horses, 8.44 million donkeys, 0.41million mules and about 1.21million camels and 56.53 million poultry [1]. This livestock sector has been contributing considerable portion to the economy of the country and still promising to rally round the economic development of the country. In Ethiopia livestock contribute 30-40% of Agricultural Growth Domestic Product (GDP), 16-20% of national GDP and 14-16% of foreign exchanges [2] however, shortage of feeds, livestock disease and 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 [3].

Livestock performs multiple functions in the Ethiopian household economy by providing export commodities, such as live animals, hides and skins to earn foreign exchanges; cash income and cash saved, provide power for the cultivation of the smallholdings and for crop threshing virtually all over the country and are also essential modes of transport to take holders and their families long-distances, to convey their agricultural

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products to the market places and bring back their domestic necessities. Livestock as well confer a certain degree of security in times of crop failure, as they are a "Near-cash" capital stock [1].

In Ethiopia, dairy production is one of the sub-sectors of livestock production that contributes to the livelihood of the owners through important sources of food and income; even though dairying has not been fully exploited and promoted in the country [4]. PARI [5] reported the average intake of milk of Ethiopia is 19 lt per capita which is below an estimated standard for African 40 lt per capita and well below the world average of 105 liters per capita consumption.

With cattle population of 24, 144, 361 Oromia National Regional state stands first in Ethiopia and West Wollega Zone has 58, 117female cattle used for milking purpose [1]. Hence, West Wollega Zone in general and Gimbi district in particular, is very well suited for dairying because the area is endowed with such enormous cattle resources and climatic situations conducive to cattle production. There is also high demand for dairy and dairy products and there is no a cultural taboo or prejudice toward milk consumption in western Oromia [6].

Even though dairy production is a source of nutritious food, income and job opportunities to the dairy producers' households in the study area, there is low production and productivity owing to poor management practices. Awareness and knowledge of available standards for dairy production and management practices is not well understood; no development activities undertaken in the area to know the current state of art, challenges and opportunities available for research and development endeavors in the dairy production. Hence, the producers may not get reasonable benefit from their dairy activity and utilization efficiency of dairy and dairy products may be low. Therefore, identification of prevailing problems and thoughtful of the existing dairy production system in the area is vital to devise appropriate development interventions. Hence, this study was carried out in Gimbi district to characterize the existing dairy cattle production systems, to assess dairy cattle management systems and feeding practice and to determine and prioritize common dairy production constraints in the study area.

MATERIALS AND METHODS

Study Area: Gimbi district is located at about 441 km away from Addis Ababa, the capital city of the country to the west. Geographically, the district is located 9°10°- 9°17° North latitude and 35°44°- 36°09° East longitudes; covering a land area of 100, 965 hectare (1009.65 km^2). The area has one long rainy season extending from March to mid October with annual rainfall ranging from 1400-1800ml. The mean minimum and maximum annual temperature ranges between 10°C and 30°C and the elevation of the study area ranges from 1200 m-2222 m a.s.l. Mixed crop-livestock agriculture is the main stay in the area. Like to many parts of Ethiopia, the study area is endowed with significant number of domestic animals; 93, 640 cattle, 46, 115 sheep, 7, 207 goats, 131 mules and 80, 370 poultry [7].

Study Population and Study Design: Households owning dairy cattle of any breed and size in the district constituted the study population. This research was prospective and cross-sectional survey based type, focused on the selected area. Before starting the study overall information of the district was assessed. This includes identification of the dairy potential areas and selection of the kebeles. A questionnaire-based survey was also used to collect data needed for assessment of dairy production system and constraints associated with dairy sector in the study area. The study also involved field visits and observation, focus group discussion and key informant interviews.

Sampling Methods and Sample Size: The study district was purposively selected due to the presence of relatively large number of cattle, high smallholders' dairy cattle producer, high demand for milk and milk products. Moreover, the socio-economy of the society was highly relying on crop-livestock production and marketing and marginality of the district to most technological interventions as compared to the neighboring districts. In order to characterize the dairy production systems in the study area, farmers/producers were interviewed using pre-tested semi-structured questionnaires. Multi-stage purposive and simple random sampling procedure was implemented at three stages. In the first stage, potential kebeles were identified and after having livestock population data (Cattle) at each kebele in the district and four kebeles, namely, Chuta Giyorgisi, Lelisa Yesus, Bikiltu Tokuma and Enango Dembali were selected purposively based on high smallholders' dairy cattle producers, potential and viability of dairy production. In the second stage, individual households owning dairy cows of any breed and size were identified and listed in selected kebeles. In the third stage, individual dairy cow owner households were randomly selected from the list for an interview.

By using [8] formula the sample size for collecting quantitative data for this study was determined as follows:

$n= N /1+N (e)^2$

where,
n - Designates the sample size the researcher uses;
N - Designates total number of households owning dairy cows;
e - Level of precision or margin of error 8 % (0.08).
1 - Designates the probability of the event occurring

Thus, $n=770/ (1+770 \times (0.08)^2)$, n=130, which is the determined sample size for the study.

Sources and Methods of Data Collection: Both primary and secondary data from different sources were used. A semi- structured questionnaire on wider variety of issues pertaining to dairy production system and constraints associated with dairy sector were prepared and translated into vernacular language of the study area (*Afan Oromo)* and was used to collect data on socio-economic characteristics of households, major feed sources, cattle breed types and breeding system, productive performance of the local and crossbred cows and related constraints in the study area.

Data Management and Analysis: Collected data were entered into spreadsheet (Excel, 2007) for clearance of data. The nature of the research was cross sectional with survey method and therefore, triangulation methods, i.e., quantitative, qualitative and observation were employed. Qualitative data derived from direct observations and key informants was examined and presented in the form of discussions. Descriptive statistics like mean, frequency distributions and percentage were employed for quantitative analysis. The arranged data was analyzed using SPSS software version 20 and the results were presented using means ± SE, tables, pie charts, graphs and in rank.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Households: In the present study, about 84.6% of the respondents were male and 15.4% female headed households. The present result is coincided with the findings of Zelalem Abera *et al*. [9] who reported 81.3% of the households were males while 18.7% of them were female in Selected Districts of West Wollega Zone, Western Ethiopia. In the study area, the major decisions concerning livestock sales, lending and borrowing of animals and giving animals for bride payment and ownership is the responsibility of the family head (Male) except in the case of widow woman.

The average family size of the respondent was 6.10 which in agreement with the finding of Bereda *et al*. [10] who reported average family size of 6 ± 0.18. The large family size is an opportunity for improving dairy production with respect to labor provision in cattle herding, husbandry, calve rearing and dairy product processing and marketing.

Out of the total household respondents 36.2% were in the age group ranging from 31-45 years, while about 30.76% of the respondent households were in the age group ranging from 46-55 years old (Table 1). The present result agrees with earlier report of Karume Semfuko Chaussa [11]. They indicated that the age of people involved in dairy cattle production ranged from 30 to 60 years old. Whereby the most involved were those aged between 45-60 years which formed the larger group of dairy cattle keepers followed by those aged between 31-45 years old and those above 60 years old. Age can either generate or erode confidence in new technology and learning new things, that is, with more experience or confidence a farmer can become more or less risk- averse. Therefore, the study area had relatively better potential of economically active population who could participate in dairy cattle production practices.

Literacy wise, notably large proportion of 40% and 36.9% of the sample respondents were falls in illiterate and read and write educational status, respectively. However, about 17.7% had primary school education and only 5.4% had high school education (Figure 1). Similar results were reported by Samuel [12] from Gimbi district, West Wollega. These low education levels of the society are the challenges on modernization of dairy production and commercialization of dairy product that requires a continuous training to enable the dairy productivity to move forward; because educated households improve at least some of the livestock related routine managements and alert in accepting new technologies

Herd Structure and Purpose of Livestock Rearing: As indicated in the Tables (2) the average number of cattle (7.93±0.6) is higher than sheep (1.31 ± 0.17), goats (0.93 ± 0.29) and donkey (0.88 ± 0.09) per household in the study area.

The higher proportion of cattle in the study area might be due to the strategy that the households made for drought purpose, manure for soil fertility, due to cultural restriction that other livestock species are not used for milk production.

Table 1: Age categories and average family size of the sampled respondents in the study area

	% respondents in each selected kebeles				
Age category	Chuta Giyorgisi N=26	Lelisa Yesus N=30	Bikiltu Tokuma N=39	Enango Dembali N=35	Over all N=130
≤30	2(7.67)	1(3.31)	0	4(11.43)	7(5.38)
31-45	8 (30.8)	13(43.33)	13(33.33)	13(37.14)	47(36.15)
46-55	12(46.15)	7(23.33)	11(28.21)	10(28.58)	40(30.77)
56-65	4(15.38)	8(26.7)	14(35.9)	5(14.28)	31(23.85)
>66	0	1(3.33)	1(2.56)	3(8.57)	5(3.85)
Total	26(100)	30(100)	39(100)	35(100)	130(100)
Mean ± SD of family size	5.92± 1.85	6.13±2.19	5.90±2.21	6.43±2.53	6.10±2.22

Table 2: Average herd size and composition in the study area

Animal type	Number of HHs own animals	Number of Animals	Mean ± SE
Cattle	130	1031	7.93±0.6
Sheep	52	170	1.31±0.17
Goat	27	121	0.93±0.29
Donkey	70	114	0.88±0.09

HHs=Households SE=Standard Error of the mean

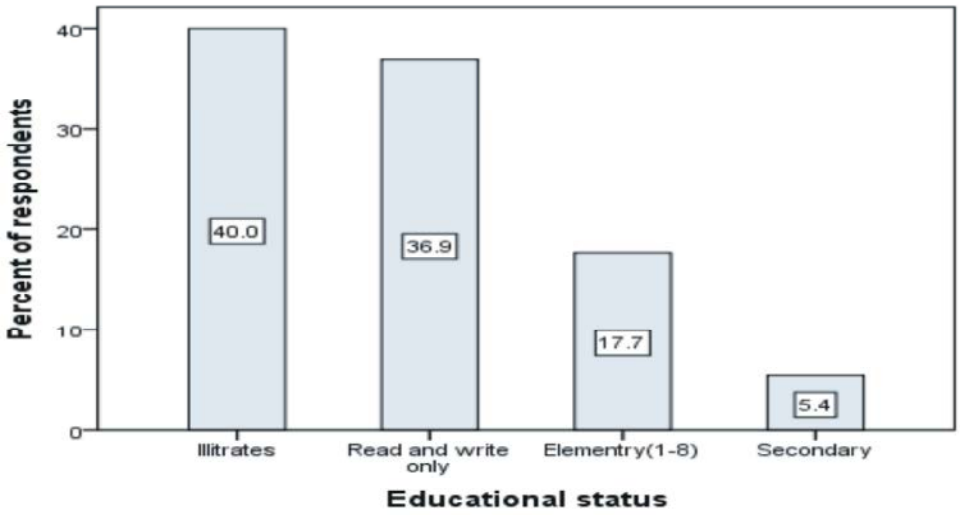

Fig. 1: Educational status of the respondents in the study area

Dairy Production Systems in the Study Area: Based on purpose of production, location, land holdings and integration with crop production as criterion, in the study area, two types of dairy cattle production systems were identified; namely mixed crop/livestock production system and peri-urban dairy production system.

Mixed Crop/Livestock Dairy Production System: This type of production system was observed to be the typical and predominant dairy production system in the study area. In this type of production, crop cultivation and livestock production are complementary, in which, livestock provides power for land preparation and crop transportation after harvest and manure as fertilizer, while crop by-products represent an important source of animal feed. Similar farm inputs were reported in Boditti [13]. This system mainly uses indigenous breed which have lower milk production, grazing of natural pasture and crop residues as major inputs which is undertaken by subsistence farmers owing indigenous breeds in large proportion and very few of crossbred cows. According to key informants interview and focus group discussion in the current study area, apart from a few crossbred dairy heifers distributed for small number of farmers by Bako Agricultural Research Center Project before ten years ago, since then no project was established to enhance milk production and encourage farmers' participation in dairy production. Producers do not practice the use of breeding records so there is the possibility of inbreeding.

In this system, livestock production is an important source of income and means of livelihood and is kept for various purposes including production of replacement stock, source of food for the family, draught power, transport, income generation (Sale of products and live animals). In this system, cows are not specialized for milk production; however, they are reared for the sake of breeding to have draught oxen and other cows. Milking cows are allowed to graze together with the total herd and there was no special feeding regime to these cows. Milk is produced by animals kept for multipurpose use. Dairy products, especially butter are produced and used as source of income to buy farm inputs and family needs while cattle are an asset securing farmers at the time of emergency.

Peri-Urban Dairy Production System: Peri-urban dairy production system in the study area has developed in and around small cities where there is high demand for milk and milk products. Mainly most of the farmers in this peri-urban depends on trade as source of income and most of them grow cash crop especially coffee in rural areas. Dairy production is minimal which is carried out by small numbers of the producers. In this production system, dairy producers had no market orientation depending on the type of products. The feeds were purchased crop residues; conserved hay, local beverage by-product (*Atela*), sugar cane tops and kitchen wastes. Like to mixed crop/livestock production system, dairy producers kept large number of indigenous cattle breed and few numbers of Holsteins crossbred cows for milk production. In both the dairy production systems, there is no cut-and-carry feeding system practiced by dairy producers in the study area. Based on high smallholders' dairy producers, relatively large number of cattle (Dairy) and potentiality, the present study was entirely focused on dairy production in the rural small-scale crop-livestock mixed production system, which is practiced by the dwellers of the district.

Cattle Management

Feed Resources and Feeding Practices: Natural pasture, crop residues, stubble grazing and local beverage by-products (*Atela*) were listed as the major feed resources in the study area, respectively (Figure 2). But the contribution of local beverage by products was minimal. Natural pasture is the major feed resources especially in wet season, whereas crop residues and stubble grazing (Aftermath grazing) were reported to be the major sources of feed during the dry season; which is consistent with previous reports of Kassahun Gurmessa *et al.* [14] for Horro and Guduru districts of Oromia Regional State, Western Ethiopia.

Both wet and dry seasons, animals were allowed to graze entirely on natural pasture on communal grazing land. There were some improved forages such as elephant grass (*Pennsetum Purpureum)* introduced in the crop-livestock production system, but there was no practice of other improved forages production and feeding of animals. Minale Getachew and Yilkal Tadele [15] also reported that 69.17% in Chencha and 82.7% of the respondents Kucha use communal grazing as feed source for their cattle. Other feed resources like hay making and urea treated with crop residues have taken minor place as source of livestock feed and feed supplements. But *atela* (Local brewery by-product), amole /salt and feed leftovers were used as feed and mineral supplements in the study area.

Feed Calendar: Grazing of natural pasture constitutes the main source of animal feed throughout the year with maximum availability during crop growing season (June to December) in the study area. Nevertheless, plenty of crop residues were available from (October to March) at the beginning of the dry season following the harvest and threshing of cereal and pulse crops. In March, additional crop residues are obtained mainly from wetland residual moisture based crop production locally known as*"Bonee"*. However, the abundant crop residues right after harvest and threshing is used wastefully by animals on the farm due to lack of proper conservation, storage and feeding systems.

Water Sources and Watering Practices: The main source of water identified in the present study area was rivers. Similar to this study andualem Tonamo *et al*. [16] reported that in Ginch area there are three water sources and these include rivers, streams and springs and majority of the households (98%) water their animals at river. Regarding the accessibility of the water, about 92.3% of the interviewed dairy producers in present study area reported that they had access to water throughout the year and only (7.7%) reported scarcity of drinking water during the dry season of the year.

Watering frequency to dairy animals varies by seasons (Wet and dry) and from one household to another. During wet season as water is abundant everywhere, more than half (57%) of the households leave their animals to look for water by themselves, while the rest 16.6 % and 26.4% of the households were watering

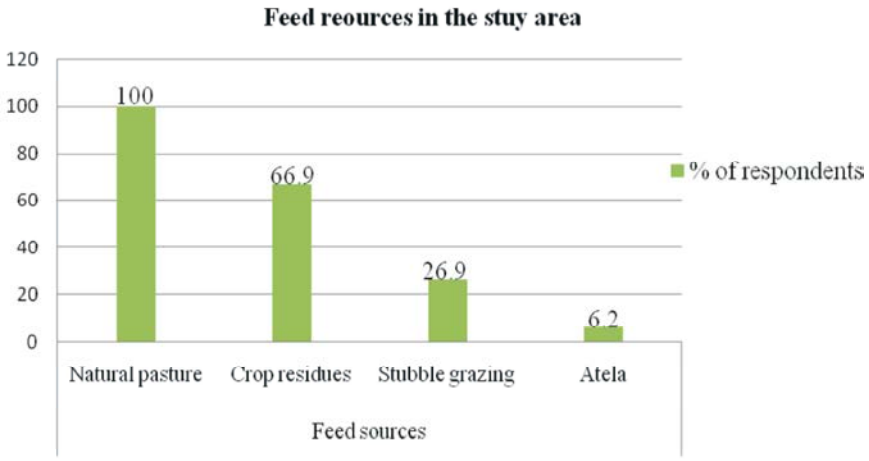

Fig. 2: Feed resources of dairy cattle in the study area

their cows once a day and twice a day, respectively. During dry season, most (84.7%) of the households provides water twice a day, while the rest were watering once a day (11.3%) and a few proportion (4%) allow freely.

Housing Systems and Waste Management: Mature cattle are kept in open enclosures locally known as "*Dallaa*" during the night to prevent them from wandering around and damaging crops or other properties and to protect them from predators. The farmers periodically shift the location of the "*Dallaa*" to adjacent sites. This is important to achieve two objectives simultaneously viz. to maintain cleanliness of the "*Dallaa*" by moving it to an adjacent new site when the "*Dallaa*" becomes dirty and secondly to distribute the manure on the farm land as the "*Dallaa*" is moved to different areas of farmland. This is a very useful indigenous traditional practice that has helped to maintain the resilience and sustainability of the smallholder agricultural system. Small ruminants, young calves and chickens are housed in one corner of the family dwelling and their excreta (Manure and urine) are cleaned from the house daily. Almost all the respondents use dung as manure on their cropland for soil fertility improvement and none of them sell and use dung as fuel in the study area.

Dairy Health Management Practices: From field observation udder injury, teat injury, leg lameness and wound was common in all study kebeles. Animal health services including vaccination and treating diseased animals were given by government employed experts. There was no adequate private sector involved in animal health related services such as clinics, shops or pharmacies participating in providing animal services or drugs except very few veterinarians illegally supply medicine for small areas of the district. Therefore, farmers forced to go to Gimbi town outside the study area, to buy drugs for diseased animals. As group discussion suggested as prescription they also practice ethno veterinary services such as spices mostly ginger, garlic, mustard, hot pepper and butter, salt and feaces of hyena for treatment of stomach ache, internal parasites and mastitis; but the dosage of the treatments and the impact of the drugs are not known. Branding is also used for treatment of blackleg and branding around the shoulder is used for treatment of Anthrax. This report is consistent with the finding of Belay *et al*. [17]. On the other hand, the efficacy and dosage of medicinal herbaceous plants should be studied for possible large-scale production and uses. During group discussion, it was also pointed out that livestock health problem was not fully addressed, because of inadequate veterinary service provided throughout the study area. Government officials in the district also anticipate the problem and attribute it to shortage of veterinary expertise and related facilities; and vaccination is only provided during diseases outbreak. Since disease is one of the major threats of livestock production, Livestock Health Management Stream in Gimbi district as a whole needs due attention.

Cattle Breeds, Seasons O Breeding and Breeding Techniques

Cattle Breed and Types: In the study area, the total number of indigenous and crossbred cattle was 93, 538 (99.89%) and 102 (0.11%), respectively [7]. The indigenous breed of cattle in the study area is nondescript. This study is in close conformity with the report of CSA [1] which states 98.59% of the total cattle

populations in the country are local breeds and the remaining 1.22% and 0.19% accounted for crossbred and the exotic breeds, respectively. Through focus group discussion farmers in the study area reported that crossbred in all the surveyed kebeles was Holstein Frisian crosses. Holstein Friesian crosses are preferred in the study area due to their colour, adaptability to the local environment and high volume of milk production. The majority of the respondents from different kebeles reported that local animals predominantly of Horro breed type. Ulfina Galmessa *et al*. [6] also reported the same result.

Season of Breeding: Even though cattle are non-seasonal breeder, reports from group discussion showed that cattle breeding (Conception, calving) was highly dependent on the season of the year. The month from June to August coincided with wet season during when abundant and nutritious fodder is available in the natural pasture. Whereas, January to May is a dry period, when the natural pasture dries up and become poorly nutritive, particularly deficient in nitrogen content. Thus, the reproductive pattern of cows followed the seasonal pattern of rainfall, which tended to influence nutrition. At the onset of rains, grasses and leaves of plants start to revive and the improved feeding situation initiate heifers and cows to be ready for breeding. As a result, the time June to August marked the months of heightened breeding in the study area followed by September to December, although the intensity of breeding activity was reduced during the latter period.

Breeding Techniques: There are two types of breeding practices: natural mating and artificial insemination in the study area. Out of the total dairy producers interviewed 89% were breeding their cows by natural mating through their own bulls and bulls owned by their neighbor and very few of them (3%) use AI but they perceived as it had no worth; and the rest (8%) use both Natural mating and AI as indicated in (Figure 3). In Abay Choman and Jimma Ganati, Eastern Oromia about 93.3% of the respondent were using natural mating and 3.9% and 2.8% use artificial insemination (AI) and both natural mating and AI, respectively [16] which is agreed with current finding. In the study area there is no structured breeding program and mating control in the herd. The lack of either AI service or selected superior bulls in the area leads to the inadvertently use of bulls with unknown pedigree which eventually poses threats of inbreeding. Therefore, work in areas of AI deserves more attention to reduce the reported low rate of AI uses by synchronizing the peak heat period and the time of insemination with advance services.

Production Performance of Dairy Cattle: Indigenous breed of cows are generally considered low milk producers. However, they are the major source of milk in Ethiopia that account for 98.59% of the total milk production in the country [1] and they contribute 99.89% for milk production in the study area. The mean daily milk yield of cows per head for indigenous and crossbred cow was 1.18±0.52 and 5.83± 0.28, respectively. Similarly, the reported average milk yields for the two genotypes, i.e., cross bred and local cow in this study were lower than the findings of Ulfina Galmessa *et al.* [6] who reported daily milk yield per liter per cow 1.2 and 6 for local and crossbred, respectively from Western Oromia. The reason for low daily milk production in the current study might be due to the effect of poor management practice like lack of proper supplementary feeding for the dairy cattle, poor nutritive value of pastures and forages offered to the animals, health management aspect and genotype.

The average mean lactation length of both local and crossbred cow was found to be 7.15±0.13 and 8.87±0.18 months, respectively. The average lactation length reported in the present study (Table 3) disagreed with the most modern dairy farms; a lactation length of 10 months is commonly accepted as a standard. This resulted from poor conserved forage availability and poor feeding practices for dairy cows.

Major Constraints of Dairy Cattle Production in the Study Area: Sample households reported that productivity and contribution of their animals is low due to several constraints (Table 4). Among those constraints, poor feed conservation and scarcity in quantity and quality, poor veterinary services, lack of improved dairy breeds, lack of credit services and diseases was the major encountered by 100 %, 97.7 %, 78.5%, 68.5% and 49.2% of the households, respectively. About 97.7% of the respondents indicated that meager veterinary service was a serious problem in the entire kebeles. This is due to the distance to veterinary service, irregular visit by the veterinarian, inadequate supply of inputs, due to shortage of experts, veterinary clinics and lack of transport.

As indicated in table 4, although diseases was reported in 5th rank (46.2%), it is a serious or the evading problems for dairy production in the study district; this is

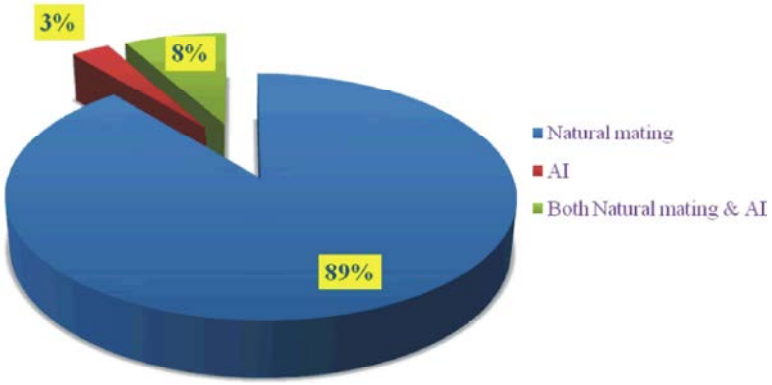

Fig. 3: Dairy breeding techniques in study area

Table 3: Some Production and Productive Performances of Cattle in the study are

	Breed	
Parameter	Local	Crossbred
Daily Milk yield (Litre)	1.18±0.52	5.83±0.28
Lactation length (Months)	7.15±0.13	8.87±0.18

Table 4: Problems encountered in dairy animal production in the study area

Problems	Total HHs (N)	N	% of respondents	Rank
Poor feed conservation practices and feed shortage	130	13	100	1st
Poor Veterinary Services	130	17	97.7	2nd
Disease	130	60	46.2	5th
Lack of credits	130	89	68.5	4nd
Lack of Improved breeds	130	12	78.5	3rd
Poor marketing system/ infrastructure network	130	43	33.1	7th
Land shortage	130	56	43.1	6th

(N) - Total number of the respondents N- number of respondents

due to poor veterinary services practiced in the study area. Similar result was reported as feed shortage and animal health are the common problem in West Shewa [16, 18] in Horro Guduru Wollega Zone, Western Ethiopia.

Poor Housing System: Not all respondents had a separate house for the herds by age and sex category except milking calf. Such un-partitioned housing system could be the source of random mating and infectious diseases. Because mostly estrous heat has been occurred early morning; so, the available bull in the herd might mate cows in heat. Similarly, Bayou *et al*. [19] reported that only calves were normally managed separately from the dams to prevent suckling during the lactation period of the cows. This housing system has negative impact of selective breeding. Therefore, since land and house construction materials are not constraints in most rural areas, they have to partition the house with local materials according the sex and age category of the cattle/ livestock.

Technical Problems: In present study there is a practice of male calves' castration those shows good growth rate. Because the farmers believed that castration reduces aggressiveness so that bull can be docility for ploughing, temperament and fetch better market price. Such kind of practice reverses breed improvement by depriving the best individual cattle from generation and by narrowing bull resource. This result agreed with the report of Bayou *et al.* [19] in Sheko. Furthermore, the entire respondent faced a problem of accuracy of estrus detection for both AI and natural mating. Because of that some of AI users costs for about three successive inseminations per estrus due to lack of technical skill in heat detection. Otherwise, the owner of dam could control and give emphasis only for the first mate during natural mating. However, per day the dam would mate with different bulls. As a result it might lead for unwanted consequence. Similarly, Belay *et al.* [17] stated poor heat detection skills would affect AI efficiency.

CONCLUSION AND RECOMMENDATIONS

It could be concluded from the study that dairy production system was at its infant stage even though there was high demand for dairy and dairy products in the study area. The study showed that most of the respondents had no formal education and the education level of those who were educated fall under elementary education. The low level of educational back ground led the dairy producers to poor animal management and disinclination to accept newly released technologies. Cattle management system in the area was extensive crop livestock production system where grain crop production was the major activity where cattle were reared as an integral sub sector. The housing and feeding systems were not improved where the major housing system used was open fence barn/*Dallaa*/ at back yard and communal grazing land utilization was the most commonly used feeding system especially during summer season. The commonly used feed supplements were crop residue and atela (Local brewery's left over), where improved forage, grass hay and grain left over were rarely supplemented. Poor feed conservation practices and feed shortage, poor veterinary services, lack of improved dairy breeds, lack of credits services and diseases were the major constraints encumber dairy production system in the study area.

Based on the results of the present study the following recommendations are forwarded for improving dairy development in the current study area:

- The shortage of feed supply could be solved through integrating improved forage crops into cropping system and sustainable conservation, proper storage and utilization of hay and crop residues at the end of rainy season through awareness creation, training and experience exchanging between farmers.
- The dairy sector of the study area planned technical and institutional interference on provision of adequate veterinary health services, improvement and expansion of crossbred dairy cattle in the area and grant credit services for dairy producers in collaboration with micro-financial institutions to enhance dairy production and thereby improve the livelihood of the livestock keepers in the study area.

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