Food Science and Quality Management
ISSN 2224-6088 (Paper) ISSN 2225-0557 (Online)
Vol.73, 2018

Indigenous Dairy Cattle Husbandry Practice and Major Production Constraints: The Case of Alefa and Quara Districts in Northern Ethiopia

Bernabas Ayeneshet[1] Zewdu Wondifraw[2] Michael Abera[2]
1.University of Gondar, Faculty of Veterinary Medicine, Department of Animal Production and Extension, P.O.Box: 196, Gondar, Ethiopia
2.Department of Animal Science, College of Agriculture and Natural Resources, Debre Markos University, Debre Markos, Ethiopia

Abstract
This study was carried out to evaluate the dairy husbandry practices and major production constraints faced to the smallholder dairy farmers of Alefa and Quara districts in Ethiopia. 376 households who had at least one lactating cow were selected through systematic random sampling procedure. Data were collected by using structured questionnaire and the collected data were analyzed by using statistical package for social science (SPSS Version 20). The main source of feed for Alefa district was, crop residue and private grazing land (36.7%), crop residue, communal and private grazing land (41.4%), while for Quara district, communal grazing land (49.8%) and crop residue, private and communal grazing land (39.6%). In respective order, about 70.8 and 81.3% of respondents for Alefa and Quara districts were confirmed that river water was the main source to water thier dairy cows. Housing system in Alefa district was simple shed constructed adjacent to farmer's house (97.6%), but in Quara district, it was barn system (95.2%). Trypanosomiasis (58.7%), Lumpy skin disease (18.8%) and Babesiosis (8.7%) was the most challenging livestock disease in Quara district, while in Alefa district Blackleg (30.5%), Lumpy skin disease (21%) and Trypanosomiasis (20.4%) was the challenging disease. Regarding to the overall major production constraints of the study areas, in general shortage of quality feed supply was reported by the respondents as the most important constraints of dairy production and followed by prevalence of diseases.
Keywords: Crop residue, districts, feed shortage, prevalence of diseases

INTRODUCTION

The national economies and the livelihood of rural communities in Sub-Saharan African countries are largely depending on livestock production (Tilahun and Gebregiorgis, 2016). Dairy production is an important component of livestock farming in Ethiopia. The huge and diverse livestock population, varied and favourable agro-ecology for dairying, increasing demand for dairy products in urban and peri-urban areas, long-standing culture of dairy products consumption, and favourable policy are indicators of the importance and potential of dairying in the country. Despite the country's potential for dairy development, productivity of indigenous livestock genetic resources in general is low, and the direct contribution it makes to the national economy is limited. This results in shortage of supply of dairy products and requires the country to spend hard currency to import dairy products from abroad (Tegegne *et,al*., 2013).

In the country dairy production depends mainly on indigenous livestock genetic resources; more specifically on cattle, goats, camels and sheep. Cattle has the largest contribution (81.2%) of the total national annual milk output, followed by goats (7.9%), camels (6.3%) and sheep (4.6%) (CSA 2009). Challenges, like disease and parasites occurrence, shortage of feed and water availability, absence of proper housing and breeding management, lack of trained manpower and poor marketing practice are some of the major reasons for poor performance of dairy cattle production and cause a huge loss of production and productivity of dairy cattle in the country (Tadesse and Mengistie, 2016).

To put in place appropriate remedial interventions that would lead to enhanced productivity of the dairy subsector, understanding the prevailing overall dairy husbandry practices and understanding the major constraints of dairy production is very vital. This necessitates the need for generating site specific database under specific production scenarios. In this regard, little research has been done so far to identity the overall smallholder dairy cattle husbandry practices and its major production constraints in Alefa and Quara districts. In this research, it is endeavoured to fill this existing information gap. Hence, the objective of this study was to investigate the smallholder dairy husbandry practice, production constraints and to suggest possible solutions for the identified constraints at their production environment.

MATERIALS AND METHODS

The study was conducted in two sites namely Alefa and Quara districts in North Gondar Zone of Amhara National Regional State, Ethiopia. The two districts were selected among the many districts due to their high

potential for indigenous dairy production.

Alefa district: is located 80 km far from Bahir Dar and 144 Km from Gondar town. The area is located at 11^0N latitude and 37^0E longitude at an altitude of 750-2250 masl with annual rain fall of 950-1500 mm it has long rainy season from May to early November with diverse agro ecology. The annual average temperature ranges from 15^0C to 38^0C with an average of 26.5^0C. The soil type and climate are similar to those in many mid altitude areas in Ethiopia. Cattle, small ruminant, poultry and equines are the major livestock species kept in the district (unpublished report of Alefa District Agricultural office, 2016).

Quara District: is located 360 km far from Bahir Dar and 284 Km from Gondar town. The area is located at 12^0N latitude and 36^0E longitude at an altitude of 530-1900 masl with annual rain fall of 950-1500 mm. The annual average temperature ranges from 26^0C to 42^0C with an average of 32^0C. Cattle, small ruminant, poultry and equines are the major livestock species kept in the district (unpublished report of Quara District Agricultural office, 2016).

Sampling Procedure

Initially, discussion was held with zonal, district agricultural experts and development agents about the potential of dairy production in the area. Based on this information two districts (Quara and Alefa) were selected. Data was collected from both primary and secondary sources. The primary sources were obtained through a semi-structured questionnaire; it was pre-tested before the actual data collection was carried out. Three kebeles from each district, a total of six kebeles were selected through purposive sampling procedure. Farmers who had at least one lactating dairy cow were selected for interview through systematic random sampling procedure.

The total household heads included in the study were determined by the formula given by (Yamane, 1967) with 95% confidence level.

$$n = \frac{N}{1 + N(e)^2}$$

Were n= sample size
N= population size
e = the desired level of precision

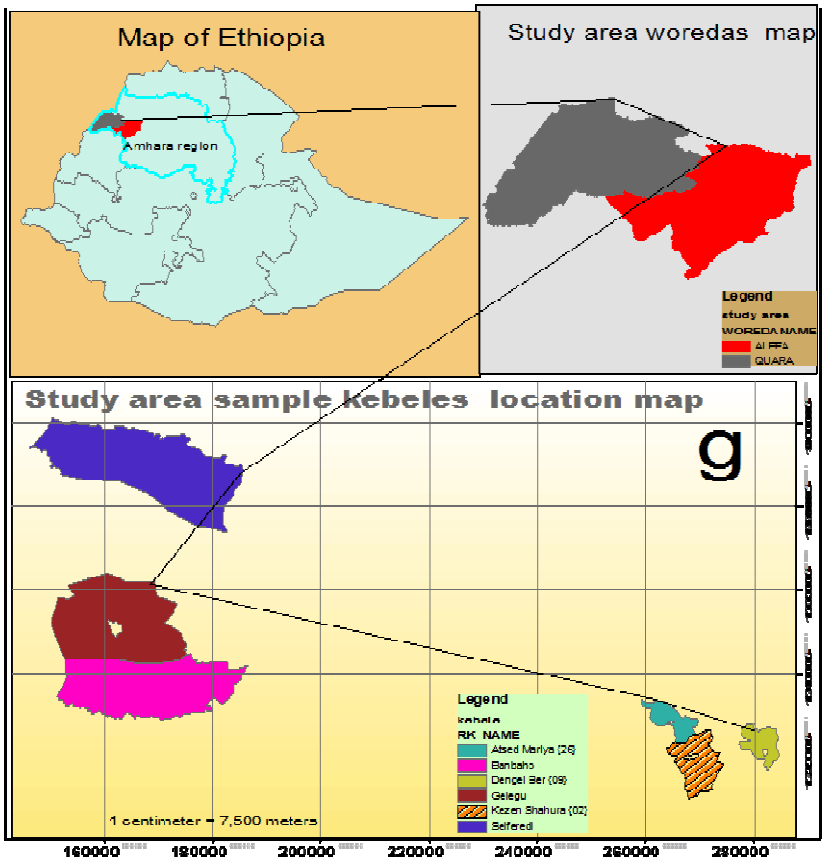


Fig1. Map of the study areas

Accordingly, from a total of 6750 population size which has lactating dairy cows of six representative kebeles, 376 households were selected.

Data Collection and Procedure

Questionnaires was designed, translated to local language, pre-tested and administered to address the description of socio-economic condition of the community, family size and major sources of income, type of livestock reared and their composition and number in the study area. Moreover, information regarding feed as well as water sources, housing system and disease prevalence was gathered.

Focus group discussion was held in two districts with the recommended group size of 8-10 households that were encompassed from different social segments. As shown in (Table 1) below, the participant consisted of district experts, developmental agents (DA's), model farmers, village leaders, elderly female and male members of the society who are known to have better knowledge on the present and past social and economic status of the area to strength the reliability of the survey.

Table 1. Summary of sampling procedure

Districts	Kebeles	Representative Sample size	Number of groups Discussion held
Quara	Gelegu	69	1
	Banbaho	70	1
	Selferedi	69	1
Alefa	Kezenshahura	56	1
	Astedemarim	56	1
	Dengelber	56	1
Total	**6**	**376**	**1**

Statistical Data Analysis

A cross-sectional study design was used to carry out the study to collect data on all relevant information from the existing indigenous cattle management condition using well structured questionnaire on dairy cattle practices and its major production constraint. The core data collected using questionnaires were analyzed by using descriptive statistics of SPSS version 20 (SPSS, 2001).

RESULTS AND DISCUSSION

Socio- Economic Characteristics of the Respondents

As illustrated in (Table 2), the household (HH) headed were reported as (95.8% and 98.6% male headed HH) and (4.2% and 1.4% female headed HH) in Alefa and Quara districts, respectively. This result is in line with the findings of (Tsegay *et al.,* 2015) in Sidama Zone and (Haftu, 2015) in Hossana Town.

Table 2. Socio- economic characteristics of the respondents by district (N = 376)

Household Characteristics	Districts				Overall	
	Quara		Alefa			
Sex of Respondents	N	Percent	N	Percent	N	Percent
Male	205	98.6	161	95.8	366	97.3
Female	3	1.4	7	4.2	10	2.7
Marital status						
Married	203	97.6	163	97.0	366	97.4
Unmarried	2	1.0	3	1.8	5	1.3
Divorced	3	1.4	2	1.2	5	1.3

N=Number of respondents

Regarding to educational status, about (83.3% and 86%) were not educated; while (13.7% and 10.1%), (1.8% and 2.9%) as well as (1.2% and 1%) were can read and write, educated elementary and secondary school, respectively in Alefa and Quara districts (Table 3). This result revealed that, most household respondents in both districts were not educated; therefore, farmers might be resistant to adopt modern dairy production system and new technologies.

Source of Income

Regarding to the source of income about (92.5% and 93.3%), (4.8% and 3.4%), (1.8% and 1.4%) as well as (0.6% and 1.9%) of the household respondents were generating their income from mixed crop-livestock production, livestock and trading, crop production, trading and livestock rearing, crop production and trading, respectively in Alefa and Quara districts (Table 3).

Table 3. Socio- economic characteristics of the respondents by district (N = 376)

House Hold Characteristics	Quara		Alefa		Overall	
Educational status	**N**	**Percent**	**N**	**Percent**	**N**	**Percent**
Illiterate	179	86.0	140	83.3	319	84.8
Read and write	21	10.1	23	13.7	44	11.7
Primary	6	2.9	3	1.8	9	2.4
Secondary	2	1.0	2	1.2	4	1.1
Source of income						
Livestock and crop production	194	93.3	156	92.5	350	93.1
Livestock and Trading	7	3.4	8	4.8	15	4.0
Crop production and Trading	3	1.4	3	1.8	6	1.6
Livestock, crop production and Trading	4	1.9	1	0.6	5	1.3

N=Number of respondents

This study is in contrast to Girma *et al*., (2014) as they reported 53.3 and 40% of farmers were generating income from selling of milk and milk products in and around Mekele city.

Family Size and Land Holding Pattern

The family size and land holding pattern in the study districts are given in Table 4. The mean of the family size was 7.36±0.15 and 6.02±0.13 heads/household in Alefa and Quara districts, respectively and there is a significant ($p<0.001$) difference between districts. The overall mean family size was 6.62±0.10 heads/household. The average family sizes obtained in this study were comparable with the result 6.62 heads/household for Mieso (Azage *et a*l., 2013). However, it was more than the result (5.10±0.27 heads/household) obtained around Dire Dawa (Tesfu, 2006).

Land is one of the important resources for dairy farming. However, due to population pressure and urbanization land size per household and communal grazing land has been decreasing. The average land holding of the respondents between districts was significantly different ($p<0.001$). It was 1.65±0.07 and 10.83±1.86 hectares in Alfa and Quara districts per household, respectively. Land holding per household in Alfa is much smaller than Quara district. The current data of overall land holding per household (6.24±0.97) is greater than the findings (1.6 ha) of Azage *et al*., (2009) in North Gondar zone, Amhara National Regional State of Ethiopia.

Table 4. Number of families and land holding pattern per households

Descriptives	Quara	Alefa	Overall	
Number of families	**Mean ±SE (N=208)**	**Mean ±SE (N=168)**	**Mean ±SE (N=376)**	**P-value**
Male	3.10±0.09	3.63±0.11	3.33±0.07	0.000***
Female	2.97±0.01	3.71±0.11	3.30±0.76	0.000***
Total	6.02±0.13	7.36±0.15	6.62±0.10	0.000***
Landholding (ha)				
Total land	10.83±1.86	1.65±0.07	6.24±0.97	0.000***
Cultivated land	9.27±1.80	1.43±0.63	5.35±1.22	0.000***
Private Grazing land	1.56±0.19	0.22±0.14	0.89±0.13	0.000***

N=Number of respondents, SE=Standard Error, ***= shows significant difference ($p <0.001$)

Livestock Composition

Table 5 shows the livestock species and number per household in the study area. The cattle, sheep and goat holding per household in Quara district is significantly larger ($P<0.001$) than Alefa district. This means, there was higher herd number in the lowland (Quara) than mid land (Alefa) district. Availability of huge open grazing lands in Quara district than Alefa district might be the probable reason for significant herd number differences. The preference to a specific species of animals is aimed at matching with the prevailing environmental conditions, purpose, and as a means to judiciously use natural resources (Tegegne *et al*., 2013).

Table 5. Livestock composition per household's level

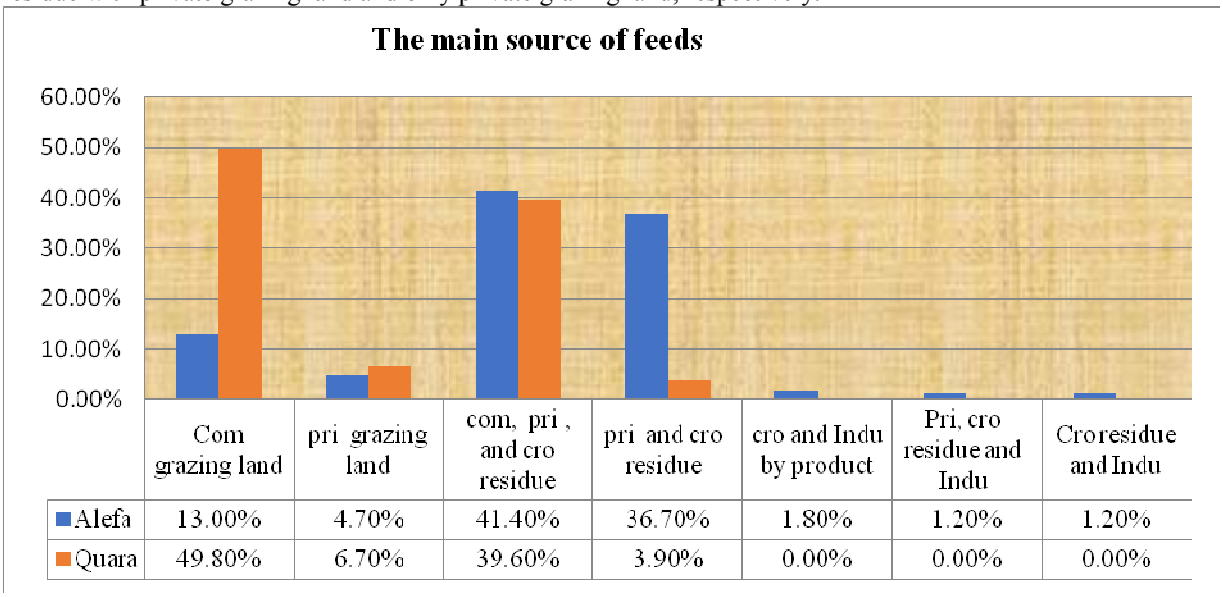
Livestock Composition(Mean ±SE)	Quara(N=208)	Alefa(N=168)	Overall N=376	P-value
Oxen	4.69±0.39	2.33±0.08	3.64±0.22	0.000***
Bull	4.32±0.31	1.58±0.08	3.10±0.19	0.000***
Cows	9.77±0.83	2.14±0.10	3.36±0.501	0.000***
Lactating cows	7.36±0.57	1.51±0.06	4.74±0.348	0.000***
Calves	8.71±0.99	1.85±0.99	5.64±0.575	0.000***
Heifers	5.84±0.42	1.70±0.11	3.98±0.261	0.000***
Average cattle population	**6.78±0.59**	**1.85±0.24**	**4.32±0.42**	**0.000*** **
Goats	9.69±0.92	2.90±0.38	6.66±0.56	0.000***
Sheep	7.37±0.86	3.38±0.36	5.59±0.51	0.000***
Average shoat population	**8.53±0.89**	**3.14±0.37**	**5.84±0.63**	**0.000*** **
Donkey	1.77±0.12	0.65±0.09	1.01±0.08	0.000***
Camel	0.08±0.01	0	0.03±0.002	0.000***
Mule	0.10±0.02	0.14±0.03	0.11±0.02	0.23 NS
Poultry	8.38±0.49	7.63±0.57	8.04±0.37	0.321NS
Heaves	0.26±0.49	0.76±0.18	0.48±0.09	0.004**

N=Number of Respondent, SE= Standard Error, **= shows significant difference (p <0.01),
***= shows significant difference (p <0.001), NS= Not significant

The overall mean of cattle ownership per household were 4.32±0.42 heads, and there is a significant difference (P<0.001) between the two districts. This result is lower than Tegegne *et al*., (2013) as they report 9.02 in Bure district west Gojjam zone and 15.53 cattle ownership per household in Metema district of North Gondar zone. The average cattle ownership per household in Quara district (6.78±0.59) was higher than Tegegne *et al*., (2013) as they reported as 3.34 and 1.51 for peri-urban area of Shashemene and Dila districts in Ethiopia.

Feeds and Feeding Management

The availability of feed resources varied depends on season and agro ecologies. The main source of feed in Alefa district were, crop residue, communal and private grazing land (41.1%), private grazing land plus crop residue (36.7%) and communal grazing land (13%), respectively (Fig 2). However, few (4.2%) of respondents were supplemented industrial by products. On the contrary industrial by products were not used in Quara district. Respondents in Quara district revealed that, the absence of infrastructure and high transport cost were limiting factors to use industrial by products in the area. The majority (49.8%) of respondents in Quara district were used communal grazing land. The rest 39.6, 3.9 and 6.7% were used communal grazing land with crop residue, crop residue with private grazing land and only private grazing land, respectively.



Com = Communal Grazing Land, Pri = Private Grazing Land, Cro = Crop Residue, Indu = Industrial by Products

Fig 2. The main source of feed for livestock production in the study areas

Feeding System

The major roughage feed resources for dairy animals across the districts included natural pasture/grasslands, crop residues, crop thinning and crop aftermath. The contribution of these feed resources, however, depends up on the agro-ecology, the types of crop produced and accessibility. In all wet and dry season, animals were allowed to graze entirely on natural pasture on communal and private grazing land. Though there is critical feed

shortage in the study area, the use of improved forages was not often and use of supplementary feeds is almost none. The dependence on natural pasture feed source is likely to continue along with increasing human population densities and corresponding extension of crop land into traditional grassland.

In the study area, overall cattle feeding system is based on natural pastures under continuous free grazing system. About 77.9% of the respondents in Quara and 20.2% in Alefa district practiced free grazing system and the rest of the respondents practiced controlled grazing and cut and carry system.

Majority (57.1%) of respondents in Alefa district were grazed their pasture by controlled grazing using fencing system. Farmers were fenced the pastures until it reaches the maturity stage, while the remaining 7.1, 24.4 and 11.3% of farmers were grazed their pasture land by using cut and carry system, free and rotational grazing system, respectively. On the contrary farmers in Quara district was not used cut and carrying as well as fencing grazing system, but almost all (95.7%) of farmers were used free grazing system with minimum (4.3%) of rotational grazing system, because most respondents were used communal grazing land and they were not managing the grazing land properly which afterwards it will create overgrazing of the pasture land. In general, land allocated for pasture/grazing is either small or is degraded with low biomass production, which cannot meet the nutritional requirements of animals across the districts.

Table 6. Feed storage system, feeding trough and feeding system

Feeding Management	**Quara**		**Alefa**		**Over all**	
	N	Percent	N	Percent	N	Percent
Feeding System						
Only grazing	162	77.9	34	20.2	196	52.1
Cut and carry	9	4.3	46	27.4	55	14.6
Both	37	17.8	88	52.4	125	33.3
Feeding Trough						
Yes	4	1.9	71	42.3	75	20.0
No	204	98.1	97	57.7	301	80.0
Feed Storage System						
On Perch Or Tree	197	94.7	18	10.7	215	57.2
Bar Land	5	2.4	42	25	47	12.5
Plastic/woody flooring	6	2.9	108	64.3	114	30.3
Grazing Management						
Zero grazing	-	-	12	7.1	12	3.2
Continuous Grazing	199	95.7	41	24.4	240	63.8
Rotational grazing	9	4.3	19	11.3	28	7.5
Fencing system	-	-	96	57.1	96	25.5
Hay Harvesting Stage						
Early flowering stage	-	-	27	16.1	27	7.2
Middle (moderate stage	28	13.5	91	54.2	119	31.6
At extend (lignin) stage	180	86.5	50	29.8	230	61.2

N=number of respondents

Water Resources, Distance and Watering Frequencies

Farmers had diverse methods of collecting water to provide their dairy cattle from different sources. The different water sources were; rivers, stream, borehole, lake and piped water (Fig 3). In the current study majority (70.8%) of respondents in Alefa district was used river water for their animals in both dry and wet season. The rest 15.5, 4.8, 3.8, and 2.8% of respondents were used lake, ground water and river, river and pipe water as well as stream water, respectively (Fig 3). Similarly, about 83.3% of respondents in Quara district were reported that the main sources of water for dairy cows were river water. The current research result was in agreement with Seid and Berhan **(**2012) reported that, river was the main source of water for livestock production. However, it wasn't similar with Zinash (2015) as reported in Sekota district; borehole water was the main source of water followed by stream. Likewise, this research result was similar with Azage *et al* (2013), whom reported that river was the main source of water in Metema district.

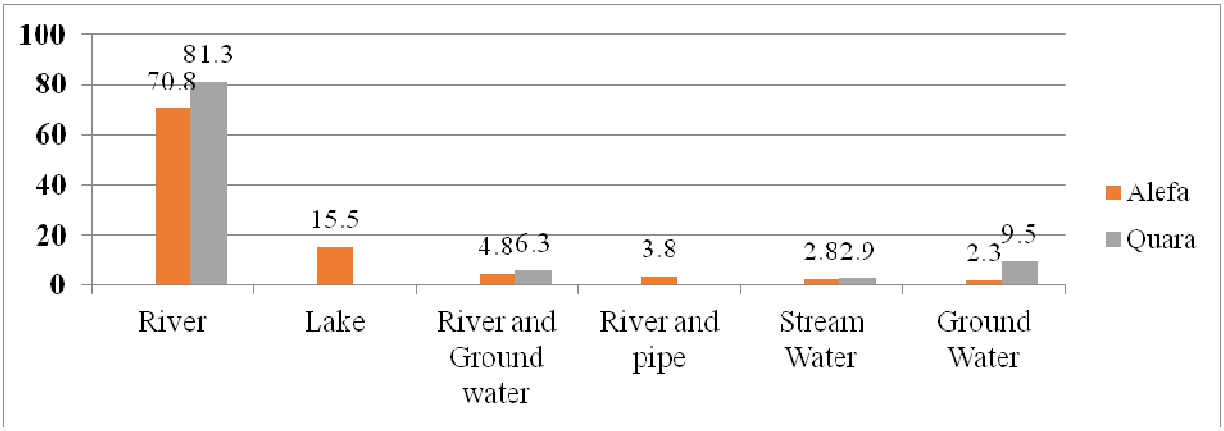


Fig 3. Percent of respondents with Source of water for their animals

There was variation between districts that, shortage of water in Quara district was more challenging than Alefa district. As respondents were mentioned, there was serious shortage of water in season of March-May in Alefa district and from December to May in Quara district. Similarly, Azage *et al*., (2013) reported that, shortage of water in Metema and Mieso districts was severed in the season of summer, since well and rivers were dry out. Watering frequency of dairy cattle depends on access to water sources, the age structure of the herd, physiological stage of animals and season (Tegegne *et,al*., 2013).

Table 7. Watering trough, watering frequency and season of water shortage

	Districts					
Descriptive	**Quara**		**Alefa**		**Over all**	
Watering Trough	**N**	**Percent**	**N**	**Percent**	**N**	**Percent**
Yes	41	19.7	66	39.3	107	28.5
No	167	80.3	102	60.7	269	71.5
Watering Frequencies						
One times/day	79	38	40	23.8	119	31.6
Two times/day	124	59.6	112	66.7	236	62.8
three times	5	2.4	16	9.5	21	5.60
Season of Water Shortage						
No shortage of water	3	1.4	53	31.5	56	15.9
Sep- May	3	1.4	2	1.2	5	1.3
Mar-May	109	52.4	108	64.3	217	57.7
Dec –May	93	44.7	5	3.0	98	26.1

SEP- MAY =September-May, MAR-MAY=March -May, DEC-MAY=December-May, N= number of respondents

Majority of the respondents (69.9%) in Alefa district reported that to provide water for their cattle it needs traveling of their cattle to water point with less than 1km. On the contrary, majority of the respondents (46.6%) in Quara district necessitate traveling their cattle to water point more than 1km. Thus, water distance in Quara district is more challenging than Alefa district as indicated in Table 8. In general Alefa district is characterized by better availability of surface water than Quara district. The current result for both districts were lower than the maximum distance 14 km reported in a study of Semi-Arid Tropics of Zimbabwe in dry season (Masikati, 2010).

Table 8. Distance of water sources

	Districts					
Descriptive	**Quara**		**Alefa**		**Over all**	
Distance of Water Sources	**N**	**Percent**	**N**	**Percent**	**N**	**Percent**
<1km	55	26.4	117	69.6	172	45.7
1-2km	97	46.6	50	29.8	147	39.1
2-3km	23	11.1	-	-	23	6.1
3-4km	27	13.0	1	0.6	28	7.5
>5km	6	2.9	-	-	6	1.6

Km=kilo meter, N= Number of respondents

Cattle Housing

Dairy animals are often housed at night and the type of housing provided varied depending upon the classes of dairy animals, agro-ecology, production system, physiological stage of dairy animals. The types of houses provided, in general, varied from roofed to simple corral with no roof (Tegegne *et,al*., 2013). Almost all 97.6% of respondents in Alefa district were used simple shed housing system which was constructed permanently with

adjacent to farmers house to protect animals from predators, theft and from adverse weather conditions. The rest 2.4% of respondents were used barn system. Hence it was not consistent with finding of Bainesagn (2016), in West Shewa Zone of Oromia Regional State, as he reported that; open barn was the main housing system for dairy cows. However, it was nearly similar with finding of Desalegn *et al.* (2016) at Bishoftu and Akaki noted that, 88.5 and 87% of respondents were use permanent enclosure house in Bishoftu and Akaki, respectively.

Table 9. Housing and flooring system for dairy cows in two districts

	Alefa		Quara		Overall	
	N	Percent	N	Percent	N	Percent
Housing system for dairy cows						
Simple shed (adjacent to the main house)	164	97.6	10	4.8	174	46.3
Separated housing	-	-	-	-	-	-
Barn	4	2.4	198	95.2	202	53.7
What is your Flooring Type						
Bare floor	89	53.0	198	95.2	287	76.3
Cemented Floor	4	2.4	0	0	4	1.1
Slated Stones	75	44.6	10	4.8	85	22.6

On the contrary, about 95.2% and 4.8% of respondents in Quara district were used barn and simple shed housing system, respectively. It was in line with Seid and Berhan (2012) reported that, 85% of small holders in lowland areas of Buraju district, Segen zuria zone were used barn for their herds. In the study areas, farmers give especial attention for pregnant animals, young calves and weak/sick animals.

Disease Prevalence and Control

Diseases in dairy animals affect reproduction, milk production, milk quality and cause mortality and morbidity. As illustrated in Table 10, the major diseases that affect dairy production and productivity in Alefa district includes Blackleg (30.5%), Lump skin disease (21%), Trypanosomiasis (20.4%), Mastities (9.6%), Babesiosis (4.2%) and FMD (1.2%) under farmers management system. The disease prevalence occurred in Quara district as reported by the farmers were Trypanosomiasis (58.7%), Lumpy Skin Disease (18.8%, Babesiosis (8.7%) and FMD (1%). Trypanomiasis were more common in Quara district than other diseases, this is because of high spread of tsetse fly in this area. Moreover, as reported by the respondents tick infestation was the most limiting factor for dairy animal production in the study area.

Table 10. Common livestock disease, season of disease occurrence and bloating frequency

	Districts					
Descriptives	**Quara**		**Alefa**		**Overall**	
Common livestock diseases	**N**	**Percent**	**N**	**Percent**	N	Percent
Never sick	24	11.5	23	13.8	47	12.5
Blackleg	1	0.5	51	30.5	52	13.8
Babesiosis	18	8.7	7	4.2	25	6.6
Mastitis	2	1.0	16	9.6	18	4.8
Lumpy Skin Disease	39	18.8	35	21.0	74	19.7
Trypanosomiasis	122	58.7	34	20.4	156	41.5
Foot and Mouth Disease	2	1.0	2	1.2	4	1.1
Internal parasite						
Faciolosis	10	4.8	126	75	136	68.7
Ascariosis	15	7.2	20	12	35	17.7
Dyctocaulosis	5	2.4	22	13.0	27	13.6
External parasite						
Thick infestation	79	38.0	36	21.6	115	30.6
Mangemit	6	2.9	17	10.0	23	6.1
Both	123	59.1	115	68.4	238	63.3
Bloating						
Yes	43	20.7	110	65.5	153	40.7
NO	165	79.3	58	34.5	223	59.3

N=Number of Respondents

Regarding the treatment place and sources of medicine respondents reported that about (70.7 % and 42.9 % use Government clinic centres), (18.3 % and 50 % use Government and private clinic centres) as well as (11 % and 7.1 % use Government, private clinic centers and traditional medicines), respectively in Quara and Alefa districts (Table 11).

Table 11. Parasite Prevention Methods and Disease Treatment Center

Descriptives		Quara		Alefa		Overall
Season of Disease Occurrence	**N**	**Percent**	**N**	**Percent**	**N**	**Percent**
June-August	92	44.2	40	23.8	132	35.1
September-November	79	38.0	14	8.3	93	24.7
December-January	8	3.8	36	21.4	44	11.7
March-May	29	14.0	78	46.4	107	28.5
Parasite prevention						
Regular hand control	7	3.4	4	2.4	11	3.0
Spraying	193	92.8	132	78.6	325	86.4
Both	8	3.8	32	19.0	40	10.6
Treatment place						
Government clinic center	147	70.7	72	42.9	219	58.2
Government and Private clinic center	38	18.3	84	50.0	122	32.4
Government, private clinic center and traditional methods	23	11.0	12	7.1	35	9.3

N=Number of Respondents

Major Constraints of Dairy Cattle Production

The main production constraints as revealed by the farmers include shortage of quality feed supply, inadequate water supply, prevalence of diseases, marketing problem, poor Infrastructure of their locality and inadequate extension service (Table 13). Each respondents involved in the study was requested to prioritize the constraints of dairy husbandry practice. Shortage of quality feed supply was mentioned as the most important constraint by most of the dairy cattle owners in Quara and Alefa districts with overall index of 0.41. The present result is in agreement with the finding of Fayo (2006) who reported feed shortage as the major problem that contributed to the low production and productivity of cattle in and around Dire-Dawa town. Prevalence of diseases was the second important constraint in both districts. It is also similar with Zemenu *et al*., (2014), Haile *et al*., (2012) and Ketema (2014) who reported on feed shortage lack of space and water shortage of dairy production in different areas of Ethiopia.

Marketing problem, poor Infrastructure of their locality and inadequate extension service were reported as production constraints in both areas. Access to inputs and services includes extension, animal health, credit, market information, AI and dairy inputs. However, service delivery in Ethiopia is not as effective and not up to the satisfaction of dairy farmers because the services rendered are very limited, untimely and irregular. The extension service has not satisfied the needs of farmers in terms of providing need-based service, hands on training and subject matter coverage tailored to different dairy production systems and market orientation (Tegegne *et,al*., 2013). Improving market access to dairy products creates an opportunity for enhanced dairy production. However, marketing and access to market have been reported to be the major problems in both districts.

Table 13. Major livestock production constraints in the study areas

Constraints	Quara				Alefa				Overall
	1st	**2nd**	**3rd**	Index	**1st**	**2nd**	**3rd**	Index	
Shortage of quality feed supply	120	-	11	0.32	163	-	-	0.5	0.41
Inadequate water supply	20	66	87	0.20	-	75	44	0.19	0.20
Prevalence of diseases	33	107	68	0.32	5	61	75	0.2	0.26
Marketing problem	-	35	0	0.06	-	32	14	0.08	0.07
Poor Infrastructure	35	-	-	0.06	-	-	28	0.03	0.05
Inadequate extension service	-	-	42	0.04	-	-	7	0.007	0.02
Total	**208**	**208**	**208**	**1.00**	**168**	**168**	**168**	**1.00**	**1.00**

Index = Σ of [3 for rank 1 + 2 for rank 2 + 1 for rank 3] given for particular qualitative variables divided by Σ of [3 for rank 1 + 2 for rank 2 + 1 for rank 3] for all qualitative variable considered, R1, R2 and R3= Rank1, Rank 2

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that smallholder dairy farming in Alefa and Quara districts contribute a great deal to the household welfare in terms of income generation. Feed availability in quantity and quality was reported by the respondent households as the most important constraints of dairy production followed by prevalence of diseases. The other main constraints of dairy production were inadequate water supply, marketing problem, poor infrastructure and inadequate extension service. Moreover, trypanosomosis, lumpy skin disease, black leg and Babesiosis were the most prevalent diseases occurred in the study areas. Based on the results of this study, the following recommendations are forwarded for improving indigenous dairy cattle farming activities in the study areas.

Recommendations

- To alleviate feed shortage particularly in Alefa district it needs attention to rehabilitate degraded pasture land, planting of perennial forage around back yards. Moreover, smallholder dairy farmers should be trained up with the concept of feeding intervention; this includes feed conservation practices, such as making of silage and hay, as well as improving the quality of crop residues by using urea treatment, especially during the dry season to solve the feed shortage.
- To solve shortage of water, particularly in dry season, developing alternative water sources such as ground water and rain water harvesting shall be in place.
- To solve problem of disease prevalence, periodic vaccination program, accessibility of veterinary clinics and good husbandry practices shall be practiced.

Acknowledgement

We would like to express my sincere appreciation to all staff of Alefa and Quara district Administration Office and Livestock Development, Health and Marketing Agency for providing the necessary baseline data for this study. Similarly, we would like to appreciate and acknowledge the farmers who participated in the survey and focus group discussions, Development Agents working in the study areas for their critical support in data collection.

REFERENCES

Alefa District Agricultural Office, Extension Beuro (2016). Socio-Economic Data of Alefa District for Kebeles.

Azage Tegegne, Berhanu Gebremedhin, Dirk Hoekstra, Berhanu Belay and Yoseph Mekasha (2013). Smallholder Dairy Production and Marketing Systems in Ethiopia: IPMS Experiences and Opportunities for Market-Oriented Development, *International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia.*

Azage T, Tesfaye M, Tesfaye D, Worku T and Eshete D (2009). Transhumance cattle production system in North Gondar, Amhara Region, Ethiopia: Is it sustainable*?* IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project. Working Paper No. 14. ILRI (International Livestock Research Institute), Nairobi, Kenya. 73 pp.

Bainesagn Worku (2016). Smallholder Cattle Production Systems and Husbandry Management in West Shewa Zone of Oromia Regional State, Central Ethiopia, Institute of Agricultural Research, Pawe Research Center, *WSN 53(3):178-188.*

CSA (Central Statistics Authority) (2009). Agricultural sample survey 2008/09. Report on livestock and livestock characteristics. Statistical bulletin 446. Addis Ababa, Ethiopia: CSA.

Dessalegn Genzebu, Berhan Tamir and Gebreyohannes Berhane (2016). Dairy Cattle Husbandry Practice and Constraints Associated with Milk Production in Bishoftu and Akaki Town of Oromia Region, Department of Animal Science, College of Agriculture and Natural Resources, Mizan-Tepi University, Mizan-Teferi, Ethiopia.

Fayo D (2006). Assessment of Milk Production, Marketing, Feeds and Feeding System of Dairy Cows in and Around Dire Dawa Town. M.Sc. Thesis. Harmaya University, Ethiopia.

Girma Chalchissa, Yoseph Mekasha and Mengstu Urge (2014). Reproductive Performance of Cross Breed Dairy Cattle in Selected Urban and Peri Urban Farm of Mid Rift Valley, Ethiopia, Adama Tulu Agricultural Research Center Ziway, Ethiopia, *African Journal Agriculture Research.9(22):1668-1693.*

Haftu Kebede (2015). Productive and Reproductive Performance of Holstein-Friesian Cows Under Farmers Management in Hossana Town, Ethiopia, Department of Animal Sciences, Faculty of Agricultural Sciences, Wachemo University, and Hossana, Ethiopia.

Haile W, Zelalem Y and Yosef T (2012). Challenges and opportunities of milk production under different urban dairy farm sizes in Hawassa City, Southern Ethiopia.

Ketema Worku (2014). Assessment of Dairy Cattle Feed Resource and Milk Yields Under Smallholder Farmers in Kersa Malima Woreda. Msc. Thesis Submitted to Department of Animal Production Studies, Msc Program in Tropical Animal Production and Health, Bishoftu, Ethiopia.33p.

Masikati P (2010). Improving the Water Productivity of Integrated Crop-Livestock Systems in the Semi-Arid Tropics of Zimbabwe: An Ex-Ante Analysis Using Simulation Modeling. Retrieved January17, 2012.

Quara District Agricultural Office, Extension Beuro, 2016. Socio-Economic Data of Quara District for Kebeles.

Seid Guyoguje and Berhan Tamir **(**2012). Assessment of Cattle Husbandry and Marketing Practice in Buraju Woreda, Segen Zuria Zone, SNNPRS, Ethiopia, Madawalabu University, School of Agriculture, Department of Animal and Range Science.

SPSS (Statistical Procedures for Social Sciences) (2001). SPSS User's guide version 20.0. SPSS Institute Inc., Cary NC.

Tadesse Guadu and Mengistie Abebaw (2016). Challenges, Opportunities and Prospects of Dairy Farming in Ethiopia: A Review, Department of Veterinary Epidemiology and Public Health, Faculty of Veterinary Medicine, University of Gondar, *World Journal of Dairy & Food Sciences. 11 (1): 01-09.*

Tegegne A, Gebremedhin B, Hoekstra D, Belay B and Mekasha Y (2013). Smallholder dairy production and marketing systems in Ethiopia: IPMS experiences and opportunities for market-oriented development. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 31. Nairobi: ILRI.

Tesfu T (2006). Chicken production systems and monitoring around the villages of Dire Dawa town, M.Sc. Thesis, Haramaya University, Ethiopia.

Tilahun Regasa and Gebregiorgis Ashebir (2016). Major Factors Influencing the Reproductive Performance of Dairy Farms in Mekelle City, Tigray, Ethiopia. *J Dairy Vet Anim Res 3(4): 00088.*

Tsegay Lijalem, Agegnew Asefa and Ashenafi Sharo (2015). Challenges and Opportunities of Dairy Cattle Production in Selected Districts of Sidama Zone, Southern Ethiopia, Department of Animal and Range Sciences, College of Agriculture, Wolaita Soddo University, Ethiopia. *Food Science and Quality Management*, *Vol.44*.

Yamane (1967). Simplified Formulas to Calculate Sample Size, Importance of the Size of Sample and its Determination in the Context of Data Related to The Schools of Gauhati University *Mathematics Association Vol. 12, 2012.*

Zemenu Y, Mekonen H, Kelay B and Bimrew A (2014). Characterization of dairy cattle production systems in Debre Markos district, Amhara Regional State, Ethiopia, Pacesetters Journal of Agricultural Science Research, 2(4): 42-51.

Zinash Worku (2015). Assessment of Livestock Production Practice and Feeding Resource in Peri Urban and Rural Areas of Sekota District in Waghimra Zone Ethiopia. An M.Sc. Thesis presented to the School of Graduate Studies Haramaya University.