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Assessment of Cow's Milk Hygienic Practices Under Small Scale Farmers in West Hararghe Zone, Oromia National Regional State, Ethiopia

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Abstract
Assessment of cow's milk hygienic practice under small scale farmers of West Harege were undertaken to assess the management routines and hygienic practices of cow's milk at small-scale dairy farmers in west Harargae Zone, Oromia National Region State of Ethiopia. From two districts representing highland and mid altitude, proportionally 12 rural kebeles were randomly selected. From each selected rural kebeles, ten farmers were purposely selected. A total of 120 small scale farmers were interviewed by semi-structure questionnaire. The collected data were analyzed by SPSS version 16 software.The study indicated that respondents of Gemechis representing the highland mostly (71.43%) used housed barn type house where as Chiro district respondents representing mid altitude were mostly (63.16%) used fenced barn type house. Teats cleaning before milking practice were reported by 51% of Chiro district farmers and 49% by Gemechis respondents. All 100% respondents of both districts were washed their hands before milking and about 50% of utensils cleaning performed after each usage in both districts. 50% of the respondents of Chiro and Gemechis (50%) used Ejersa for utensil smoking with frequency of prior to milking 47% in Gemchis districts. Respondents of Chiro district were used utensil smoking frequency 73% once a day. 68% of Chiro district respondents mix fresh milk and left over milk and 77% of Gemechis district did not mix them. 80% of respondents in Chiro district were discard milk of drug treated cows and the withdrawal periods (100%) was up to five days. In both districts, Mastitis was the major diseases reported by the respondents. Shortage of grazing land (93%) and disease (75%) were the major challenge/constraints of respondents in Chiro and Gemechis district respectively. 86% access to road and 60% suitable weather condition were the major opportunities for dairy cattle production in Chiro and Gemechis district respectively. Therefore, it suggested that microbiological analysis of milk and its product from the point of critical control Hazard Analysis, practical based trainings and identifying chemical content of utensil smoking plants (Ejersa /*Olea Africana*) in the study areas.
Keywords: Milk, Hygiene, Ejersa /Olea Africana)

1. INTRODUCTION

Ethiopia has the largest livestock population in Africa estimated at about 59.5 million heads of cattle, 1.21 million camels, 30.7 million sheep, 30.20 million goats, 5.53 million chicken, 2.16 million horses, 8.44 million asses and 0.41 million of mules (CSA, 2017). However, despite its huge number, the performance of subsector is less compared to its potential, and the direct contribution it makes to the national economy is limited (Kedija *et al.,* 2008). This low productivity is related the genetic make of the local livestock and environmental effect including management, feed and health problem. According to CSA (2017), the average milk production per cow per day is 1.37 liter.

Given the considerable potential for smallholder farmers, dairy farming provides good opportunity for efficient land, labor and feed resources uses and generates income on regular basis. It also provide highly nutritious food for all age group of human especially for infant and lactating mother that reduce malnutrition and create good job opportunities in the value adding activities that ensure food security. Hence, livestock remains to be the national resource and interconnected with crop production (Gebrewold *et at*, 2000). Cows contribute to about 95% of the total annual milk produced compared to other livestock species and the remaining 5% come from camel and goat from the pastoralist area (CSA, 2010). More than 75% of the product is absorbed locally for consumption (Getachew and Gashaw, 2001) which is true to West harerghe.

However, since it is nearly a perfect food, biologically complex fluid and good medium for many

microorganisms, the biological constituent of milk is easily changed depending on production conditions, the health status of the cattle, hygiene practices during milking, keeping and transportation of milk. Hence, the microbial content of milk is a major feature in determining its quality (Amistu, *et al.* 2015) that need strict hygienic condition of udder, teat, handling and storage equipment to avoid microbial contamination of milk due to microbial load indicate the hygienic level exercised during milking, utensil and individual cow udder cleanliness, condition of storage as well as way of transporting.

Hygienic handling practice of the milk with respect to quality has received a great concern in developing countries, where production of milk and various milk products usually takes place under unsanitary conditions and poor production practices that has greater contribution in improving human nutrition, particularly women and children (Ahmed *et al*., 2004). Production of milk for consumers requires good hygienic practices such as clean milking utensils, washing milker's hands, washing the udder and use of individual towels during milking and handling, before delivery to consumers or processors (Getachew, 2003)

The unsafe handling practice results in the higher bacterial count, which in turn may cause spoilage of the milk and poor yields of its products (Oliver *et al*., 2005). Moreover, unsafe milk not only impairs with public health but also its perishable nature makes it most susceptible to spoilage organism that could result in quantitative loss of milk (Amistu *et al*, 2015). Therefore, this quantitative loss due to spoilage affects both smallholder milk producer farmer and urban dweller who rely on milk consumption from the rural smallholder dairy producer. There are a number of factors that make food unsafe like poor handling of milk, equipment, personnel, water, temperature at which milk is kept, pesticides and drug residue, adulteration, dairy cow's health and hygiene as well as the hygiene of the environment. Such safety problem can have negative impact on the food security of the country in extreme case (FOA, 2011). This mishandling resulted in post-harvest losses of up to 40% of milk and its by product from milking to consumption (Felleke, 2003). Reducing such losses and improving quality are effective ways of making more and safer milk available that benefits both producers and consumers.

Zelalem (2010) stated that, the provision of milk and milk products of good hygienic quality is desirable from consumer health point of view. With respect to this, west harerghe area in general, Chiro and Gemechis districts in particular are known in milk production by smallholder dairy producer where most of the milk produced in the districts sold in chiro town. The raw milk is thus marketed either directly through informal cooperative or producers without any form of pasteurization or quality controlling measure. But, scientific information on its hygienic aspects has not yet documented. Thus, the current study is initiated to investigate the hygienic practices of raw cow's milk produced under small-scale farmers in Chiro and Gemechis districts. And subsequently, this study is expected to answer the following research questions:

I. Is there sufficient management that is given to raw milk hygienic practice in the districts? and
II. To what extent farmers perceived hygienic milk?

Therefore, the objective of this study was:

- To assess the management routines and hygienic practices of cow's milk at small-scale dairy farmers in Chiro and Gemechis

2. MATERIALS AND METHODS

2.1. Description of the study area

The study was conducted in selected district of west Hararghe zone namely; Chiro and Gemechis district representing the zone due to large livestock population and much milk production and discharge to the zonal town of Chiro.

Gemechis district is located at 343 km East of Addis Ababa at longitude of 40°51'0''E- 40°09'29''E and latitude of 8°52'30''N and 8°42'0''N in the attitude range of 1500-2750 m.a.s.l with the mean annual temperature and rain fall 20°C - 23°C and 850- 1000 mm. Climatically, the district has three ecological zones of which 25% is high land, 45% midland and the rest 30% lowland. According to Gemechis district Agricultural statistics information, the district has about 221,711cattle, 120,000 goat, 30,000 sheep, 31779 equine, 98,058 poultry and 12,355 honeybee colonies (GBLF, 2017).

On the other hand, chiro district is located 326km East of Addis Ababa in the map greed of 1,002,072 Northing and 695,703 Easting. The district is bordered by seven districts namely, Meiso to the West, Tulo to the East, Kuni to the South, Doba to the North, Masala to the Northeast, Gamachis to the Southeast, and Guba Qoricha to the Southwest. The altitude of this district is ranging from 970 to 1,410 m.a.s.l with the annual of rainfall of 650mm - 950mm and mean annual temperature of 17.50c- 27^{0}c. Climatically, the district has three ecological zone of which 10% highland, 57% midland and 33% it lowland. According to Chiro district Agricultural statistics information, the district has about 99,517cattle, 76,407 goat, 40,762 sheep, 16632 equine, 643 camel, 122,903 poultry 10652 honey bee colonies (CBLF, 2017).

2.2. Study design and population/Data Collection method Survey

A single-visit-multiple-subject survey method and purposive sampling method was employed using semi-structured questionnaire for interviewing to collected data on sanitary conditions of the barn/milking environment, hygiene of milking cows' udder and milk handlers, hygiene of milking equipment, frequency of cleaning the containers, milking, and milk handling practices, type of utensils used for milking, processing and storage and uses of milk for selling or domestic purposes and methods of milk utilization and marketing and major constraints of milk hygienic practices. The study population were small holder farmer who have lactating cow and involved in milking, processing and marketing milk and milk product; yoghurt and butter.

2.3. Sample size determination and ~~Household~~ sampling procedure

Household milk producers that involved in the study was selected based on potential of milk and milk product production; market orientation and willing to participate in the study, ready to give the required information through questionnaires and group discussion during the study time. Accordingly, from each district, six rural kebeles were selected randomly. From each selected rural kebeles, 10 farmers were selected purposively based on the number of livestock keepers, milk production and accessibility with the help of livestock extension officers. Therefore, a total of 120 farmers were selected from the districts for interview using structured questionnaire.

2.4. Data Analysis

Data collected were analyzed using SPSS software (ver., 2007) package. Descriptive statistics such and mean, frequency distribution and percentage was used to report the result.

3. RESULT AND DISCUSSION

3.1. Socio Demographic Characteristics of the Respondents

A total sample size of smallholder dairy farmers household respondent handled during the survey in cross sectional study in Chiro and Gemechis districts was 120. Out of the total sample respondents, females comprised 59.2% (n=58) in Chiro where as 40.8% (n=40) in Gemechis districts that revealed women's were participated in dairy activities in both districts. In Gemechis district male farmers 91% were participated in dairy activity. This finding agrees with Yitaye *et al*. (2008) that reported in northwest Ethiopia. This might be partly due to traditionally women are not mostly participate on farm activities and due to the nature of activities of dairy done with special attention, which are not convenient for women due to household workloads.

Regarding to level of education, 50.8% and 49.2% of those interviewed respondents had not received any formal or informal education in Chiro and in Gemechis districts respectively. 50% of the interviewed in both district attended Kuran and 9-12 grades equally (Table 1).This result indicated that dairy activity was performed almost by educated farmers in both districts.

Table 1. Socioeconomic profile of the respondents in the study areas

		Districts					
		Chiro		Gemechis		Total(N)	
		N	%	N	%	N	%
Sex	Male	2	9	20	91	22	100
	Female	58	59.2	40	40.8	98	100
Educational Status	1-8grade	20	48.8	21	51.2	41	100
	Illiterate	31	50.8	30	49.2	61	100
	Kuran	7	50	7	50	14	100
	9-12grade	2	50	2	50	4	100
Marital status	Married	59	52	55	48.2	114	100
	Polygamy	1	100	-	-	1	100
	Widowed	-	-	5	100	5	100

N= Number of respondent in districts, % = Percentage

The mean of the age, family size, land size and TLU of the respondents in Chiro and Gemechis districts were 35.37, 5, 1.38 and 2.35 and 35.52,5.35,1.38, and 2.5 respectively (table2). These ages composition implies that the respondents engaged in dairy activity were in potential productive ages. The land size possession of the respondents was very small. In line with this study, the finding carried out by Belay and Geert (2015) showed that most (96.3%) of the respondents owned without land use their residential compound as a place where dairying is in Jimma, Ethiopia. This reveals that the land owned by the respondents is very small and inadequate to produce agricultural products that sustain the livelihoods of farmers of the area. Thus, involvement in dairy activity is one alternative for the farmers so as to increase their income as dairy not compete with agricultural activities and does not need large farm size. In addition to this, the study areas are more of mountainous and not suitable for cropping land.

The average family sizes of the respondents in both districts were five members per household. The mean TLU of the respondents in Chiro and Gemechis districts were 2.35 and 2.5 respectively.

Table 2. Age, family size, land size and TLU of the respondents

Districts	Category	N	Minimum	Maximum	Mean	± SD
Chiro	Age	60	23	56	35.37	8.22
	Family size	60	2	10	5	1.74
	Land size (ha)	60	1	3	1.38	0.52
	TLU	60	0.2	6.1	2.35	1.36
Gemechis	Age	60	20	63	35.52	8.48
	Family size	60	2	10	5.35	1.98
	Land size (ha).	60	1	3	1.38	0.52
	TLU	60	0.7	5.65	2.5	1

N=Number of the districts respondents, SD=Standard Deviation, TLU=Total Live Stock Unit (Cattle=0.7, sheep/ goat= 0.1, poultry= 0.01)

3.2. Dairy Cattle Management

3.2.1. Dairy Cattle Housing and Cleaning Practices

This study indicated that respondents of Gemechis mostly (71.43%) used housed barn type shelter that can make the animal confortable and enhance their health status while Chiro district respondents were mostly (63.16%) used fenced barn type house where the chance of milking cow infected with disease is high. This result almost in line with Saba (2015) report who stated that all (100%) of the respondents were used barn type of house for their cows and milking in the house in Ada'a Berga and Ejerie districts of West Shoa Zone of Ethiopia. This is imply that, it may be due to different weather condition of the study sites. Gemechis district was colder than Chino. Regarding barn cleaning frequency, 58% and 44% of the respondents of Gemechis and Chiro districts clean their barn daily respectively(Table 3).. This revealed that Gemechis district respondents were pay more attention for their dairy cattle health and their products rather than respondents in Chiro district.But, in both district, the respondent (82.3%) did keep the calves in good hygienic condition as well as all interviewed producers allow their calves to suckle before milking and in between milking for few minutes.

Table 3. Dairy cattle house type and cleaning frequency

		District					
		Chiro		Gemechis		Total	
Parameters	Category	N	%	N	%	N	%
Type of house	Housed	20	28.57	50	71.43	70	100
	No barn	28	90.32	3	10	32.3	100
	Fenced	12	63.16	7	36.84	19	100
House cleaning frequency	Daily	44	42	60	58	104	100
	Once in 3 day	11	100	-	-	11	100
	Once in 3a week	5	100	-	-	5	100

N=Number of the districts respondents, %= Percentage

3.2.2. Dairy cattle feeding and watering

According to the respondents in the study areas, grass and crop residue was mostly (81%) used as feed source in Chiro district. This result agrees with Yien (2014) who reported that the main source of cattle feed (100%) was natural pasture in Jikawo Woreda of Nuer Zone, Gambella Region, Ethiopia. Stover and natural grass were the mostly (64 %) used as feed source in Gemechis district. In case of supplementing improve grass with natural grass in dairy cattle feed, Chiro district was good than Gemechis. This may be implies that the respondents of Chiro district were informed about the importance of improved grass as a result of infra structure (like road). There were different source of water used for cattle in the study areas. Surveyed respondent reported that pond water (79%) used as source of water in Gemechis district followed by river and 60% was used river as source of water in Chiro district (Table 4). Similar to this study, Mesfin(2015) reported that 94.2% respondents had access to river water for their dairy cattle followed by dug well water in Sidama High Lands of Southern Ethiopia.

Table4. Feed source, barn cleaning frequency and source of water

		Districts				
		Chiro		Gemechis		Total
Parameters	Category	N	%	N	%	
Feed source	Natural grass and crop residue	29	81	7	19	36
	Stover and natural grass	29	36	52	64	81
	Improved and natural grass	2	67	1	33	3
Source of water	Pond	3	21	11	79	14
	Pipeline and river	10	100	-	-	10
	River	43	60	29	40	72
	Pipeline water	4	67	2	33	6
	Stream	-	-	18	100	18

N=Number of the districts respondents, %= Percentage

3.3. Milk Hygienic Practices

The major pathway to produce safe and quality products for the consumers is hygienic practices that reduce microbial contamination and loss of product. As a result of the study revealed, milking was done and cows were milked twice a day in Chiro (52%) and Gemechis (48%) districts by hand. Teats cleaning before milking practice were 51% in Chiro and 49% in Gemechis district. But, in contrast to this finding, Happy (2014) reported that 94.6% of the respondents did not perform cows' teats cleaning before milking in Kilosa and Mvomero Districts, Tanzania and Amistu, *et. al,* (2015) also revealed that 77.2% of the respondent in Sebeta, Suluta and Holeta around Addis Ababa wash their hand before milking that has a profound effect on the quality of milk. It was reported by Depiazzi and Bell (2002) that pre-milking udder preparation and teat cleaning play important part in the microbial load of milk, infection with mastitis, and environmental contamination of raw milk during milking All of the respondents (100%) practiced washing of their hand with water in both districts before milking. But, it is not efficient since the hand was washed without detergent using water from pond, river and /or stream in Chiro (55.3%) and Gemechis (44.7%) and 30.8% and 69.3% of the respondent in Chiro and Gemechis used cold pipe water respectively. This is due to lack of training for producers on the washing of their hands that mitigate the growth of microorganisms and maintaining the safety of products thereby enhancing the safe product available for consumers and reduce the loss of product that have profound effect on food security since water type and source used for washing hand and utensil have an effect on microbial contamination of the milk.

However, none of the interviewees wash their hands between milking that may contaminate the milk as a result of milker hand in contact with calf during second milking. In contrast to this finding, Mesfin (2015) reported that 64.2% of the respondents across the three districts did not wash their hands before milking in Sidama High Lands of Southern Ethiopia. About 50% of utensils cleaning frequency performed after each usage in both districts. This indicated that half of respondent farmers were know/informed the health importance of utensil cleaning.

Table 5.Milk hygienic practices during milking at study sites

		District		
		Chiro	Gemechis	Total
Parameters		N(%)	N(%)	N(%)
Milking frequency	Twice a day	57(52)	53(48)	110(100)
	Once a day	3(30)	7(70)	10(100)
Teat Cleaning before milking	Yes	53(51)	50(49)	103(100)
	No	7(41)	10(59)	17(100)
Do you wash your hands before milking	Yes	60(100)	60(100)	120(100)
Utensils cleaning frequency	After each usage	59(50)	59(50)	118(100)
	Three times a week	1(100)	-	1(100)
	Not cleaned at all	-	1(100)	1(100)
Source of water	pond, river and /or stream	52(55.3)	42(44.7)	94(100)
	cold pipe water	8(30.8)	18(69.2)	26(100)

N=Number of the districts respondents, %= Percentage

The survey results showed that half (n=25) of the interviewees practices cleaning of milk handling equipment using warm water before using in both districts and the rest 50%(n=35) used cold water without detergents to wash milk handling equipment followed by smoking. In contrast to this, Welearegay *et. al,(*2012) stated that overall 85.6% of the producers used warm water together with detergents to wash milk handling equipment while 12.1% of them cleaned with cold water.

The respondents were smoked their utensil by burning wooden chips of specific trees species for the purposes of having special test and odor and reducing the numbers of micro-organisms and thereby extending the shelf life of raw milk and its products. Accordingly, almost half of the respondents of Chiro and Gemechis (50%) used "*Ejersa"* (*Olea Africana*) for utensil smoking with frequency of prior to milking (59%) in Gemechis districts and the rest used *Suke*. Respondents of Chiro district were used utensil smoking frequency of 73% once a day (Table 6). In Agreement of this study, about 40% of the respondent in Holeta, Sululta and Sebeta uses traditional flavoring agents of "Ejersa/Woira"(22.5%), "Suke/Kosorot"(*Ocimum hardiense*)(20.6%) and Ajakis and anti-microbial effect for cleaning milk transporting equipment (Amistu *et al,* 2015) and low acid production was observed in milk samples stored in smoked containers (Helen and Eyasu, 2007; Gurmessa, 2014) in Kombolcha woreda, Eastern Ethiopia.

Table 6. Milking and storage utensil and smoking material and frequency

		Districts					
		Chiro		Gemechis		Total(N)	
Parameters	Category	N	%	N	%	N	%
smoking material/plant	*Ejersa*	51	49	54	51	105	100
	Suke	9	60	6	40	15	100
Frequency of smoking milk utensils	Prior to milking	38	41	54	59	92	100
	Once a day	16	73	6	27	22	100
	Once in two day	6	100	0	-	6	100

N=Number of the districts respondents, %= Percentage

3.4. Milk handling and selling practice

The result of this study revealed that, 68% of Chiro district respondents mix fresh milk with left over milk and 77% of Gemechis district did not mix them. The experience of Gemechis district was implies that mixing healthy milk with unhealthy milk may disturb the chemical composition of milk i.e. as the time advances the chemical composition of the milk disturbed. The study also revealed that, about 53.7% of the chiro and 46.3% of Gemechis district respondents used local materials of " kabaa/buqe/Kill" for milking and storage and 47.4% and 52.6% of Chiro and Gemechis respondent use plastic material respectively and the remain Gemechis smallholder dairy farmers use clay pot(Table 6). In contrast to this finding, almost all of the participants in Sululta, Holeta and Sebeta use plastic materials for milking, storage and transportation of milk and insignificant number of participants used metal can and stainless steel and 1.1 % used clay pot for storage before transportation (Amistu *et al,* 2015). Similarly, Almaz (2014) reported that 66.7% of producers in the dairy farms used plastic containers for storage in Mekelle, Northern Ethiopia. This is due to the accessibility of milking and storage materials in the study areas.

Table 7. Milking and milk storage materials

		Districts				
		Chiro		Gemechis		
Parameters	Category	N	%	N	%	Total(N)
Do you mix fresh and left over milk for consumption	*Yes*	49	68	23	32	72
	No	11	23	37	77	48
Did you store the milk	Yes	57	59	39	41	96
	No	3	13	21	87.5	24
Milking and milk storage materials	Plastic	9	47.3	10	52.6	19
	Kabaa/kil	51	53.7	44	46.3	100
	Clay pot			6	100	6
Did you sale raw cow milk	Yes	46	48	49	52	95
	No	14	56	11	44	25

N=Number of the districts respondents, %= Percentage

With regards to milking dairy cow, 45% and 55% were performed by the Wife of the respondents of Chiro and Gemechis district respectively. About 90% of the respondents of the Gemechis districts did not consume milk products made from raw milk and 61% respondents of Chiro district boil milk before consumption and 49 % of the Gemechis respondents were did it. Regarding to the selling of raw milk, 52 % respondents in Gemechis district sold raw milk (Table 8).

Table 8.Milking and milk handling practices

Parameters	Category	Districts				Total(N)	
		Chiro		Gemechis			
		N	%	N	%	N	%
Responsible family members for milking dairy cow from	Wife and elder daughter	7	100			7	100
	Wife, elder daughter and husband	2	100			2	100
	Wife	49	45	60	55	109	100
Consumption of milk products made from raw milk	Yes	58	59	41	41	99	100
	No	2	10	19	90	21	100
Boiling of milk before consumption	Yes	31	61	20	49	51	100
	No	24	47	27	53	51	100
Selling of raw cow milk	Yes	46	48	50	52	96	100
	No	14	58	10	42	24	100

N=Number of the districts respondents, %= Percentage

This study reveals that, 52 and 48 % of respondents in Chiro and Gemechis districts were provided milk of sick cow for calves respectively and 80% of respondents in Chiro district were discard milk of drug treated cows and with the withdrawal periods of up to five days (100%) (Table 9).

Table 9.Milk of sick and drug treated cow and discard milk

Parameters	Category	Districts				Total(N)	
		Chiro		Gemechis			
		N	%	N	%	N	%
Milk of sick dairy cow	Do not milk	26	47	29	53	55	100
	Given to calves	34	52	31	48	65	100
Milk of drug treated cow	Do not milk	9	53	8	47	17	100
	Given milk to calves	38	44	49	56	87	100
	Discard the milk	12	80	3	20	15	100
	Consume it in family	1	100	0		1	100
Length to discard the milk (withdrawal periods)	5 days	-	-	1	100	1	100
	1- 5 days	8	100	-	-	8	100
	7days	1	100	-	-	1	100
	Until the cow healthy	2	50	2	50	4	100

N=Number of the districts respondents, %= Percentage

With regard to milk utilization, most of the milk produced in the study area was sold through locally established informal cooperative at the nearby market. The price of milk was vary with season at a range of 12 to 36 with the average of 25.2±7.82ETB in chiro district and 12 to 32 with the average of 20.1±4.95ETB (Table 10). This implies that there is high demand of milk in the area to generate income for the producers. However, the production level of the cow was very low, 1.27±0.67 liter per day per cow that related with national average milk yield per cow per day that stated as 1.37 liter (CSA, 2017) because of the majority of the cow are local breeds.

Table 10. Price of milk per districts

Districts	N	Mean	SD	Minimum	Maximum
Chiro	46	25.2	7.82	12	36
Gemechis	49	20.1	4.95	12	32

N=Number of respondents in both districts, SD= standard Deviation

3.5. Dairy farming Challenge and Opportunities

The major dairy cattle production constraints reported by respondent farmers were; 49% Mastitis, 87% Black leg followed by Bloating and Pasturolosis in Chiro district and 51% Mastitis, 13% Black leg followed by Bloating and Pasturolisis in Gemechis district. In both districts, Mastitis was the major diseases reported by the respondents (table 12). This implies that half of the respondent farmers were informed about the health importance of mastitis.

Table.11. List major dairy cow diseases

Parameters	Category	Districts				Total(N)	
		Chiro		Gemechis			
		N	%	N	%	N	%
Major dairy cow diseases	Mastitis	44	49	45	51	89	100
	Black leg	13	87	2	13	15	100
	Bloating	2	100	0		2	100
	Pasturolosis	1	8	11	92	12	100
	Leech/*Ulaan lulaa*	0		2	100	2	100

N=Number of the districts respondents, %= Percentage

On top of these, shortage of grazing land (93%) and disease (75%) were the major challenge/constraints of respondents in Chiro and Gemechis district respectively. Feed shortage was the second (65%) major dairy cattle production constraint (table.13).

Table.12. Major dairy cattle production challenges percent shares and ranking in the study area

Parameters	Category	Districts					
		Chiro			Gemechis		
		N	%	Rank	N	%	Rank
Challenges/ Constraints	Shortage of grazing land	14	93	1st	1	7	7th
	Disease and grazing land	11	69	3rd	5	31	5th
	Improved dairy breed	5	83	2nd	1	17	6th
	Feed shortage and disease	2	50	5th	2	50	3rd
	Feed shortage	23	35	6th	43	65	2nd
	Disease	2	25	7th	6	75	1st
	Feed and water	3	60	4th	2	40	4th

N=Number of the districts respondents, %= Percentage

Though there were many challenges in the study area, there is still huge potential to increase dairy cattle production to improve the livelihood of the respondents. As indicated in table 14, 86% access to road and 60% suitable weather condition were the major opportunities for dairy cattle production in Chiro and Gemechis district respectively.

Table.13. Major opportunities for dairy cattle production in the study area

Parameters	Category	Districts				Total(N)	
		Chiro		Gemechis			
		N	%	N	%	N	%
Opportunities	Suitable weather condition	22	40	33	60	55	100
	Demand for milk	19	63	11	37	30	100
	Access to road	6	86	1	14	7	100
	Access to market	7	47	8	53	15	100
	Water availability	4	44	5	56	9	100
	Animal health clinics	2	50	2	50	4	100

N=Number of the districts respondents, %= Percentage

4. CONCLUSIONS

The study was carried out in Chiro and Gemechis districts of west Harargae Zone, Oromia Region State of Ethiopia to assess cow milk hygienic practice. Females comprised 59.2% in Chiro where as 40.8% in Gemechis districts. The mean of the age, family size, land size and TLU of the respondents in Chiro and Gemechis districts were 35.37, 5, 1.38 and 2.35 and 35.52, 5.35, 1.38, and 2.5 respectively.

This study indicated that respondents of Gemechis mostly (71.43%) used housed barn type house where as Chiro district respondents were mostly (63.16%) used fenced barn type house. Teats cleaning before milking practice were reported by 51% of Chiro district farmers and 49% by Gemechis respondents. All 100% respondents of both districts were washed their hands before milking. About 50% of utensils cleaning frequency performed after each usage in both districts. 50% of the respondents of Chiro and Gemechis (50%) used *Ejersa* for utensil smoking with frequency of prior to milking 47% in Gemchis districts. Respondents of Chiro district were used utensil smoking frequency 73% once a day. 68% of Chiro district respondents mix fresh milk and left over milk and 77% of Gemechis district did not mix them. In this study, 52 and 48 % of respondents in Chiro and Gemechis districts were respectively given milk of sick cow for calves. 80% of respondents in Chiro district were discard milk of drug treated cows and the withdrawal periods (100%) was up to five days. In this study, 52 and 48 % of respondents in Chiro and Gemechis districts were respectively given milk of sick cow for calves. 80% of respondents in Chiro district were discard milk of drug treated cows and the withdrawal periods (100%) up to

five days.

The major dairy cattle production constraints reported by respondent farmers in Chiro district were; 49% Mastitis, 87% Black leg followed by Bloating and Pasturolisis. In Gemechis district were; 51% Mastitis, 13% Black leg followed by Bloating and Pasturolisis. In both districts Mastitis was the major diseases reported by the respondents. Shortage of grazing land (93%) and disease (75%) were the major challenge/constraints respondents in Chiro and Gemechis district respectively. Feed shortage was the second (65%) major dairy cattle production constraint .86% access to road and 60% suitable weather condition were the major opportunities for dairy cattle production in Chiro and Gemechis district respectively.

5. RECOMMENDATION

Based on the finding, the following recommendations were forwarded to improve milk hygienic practices in the study areas.

To improve cow milk hygienic practices along production chain:

- ✓ practical based trainings should be given for cow milk producers on activities before milking, during milking and after milking by responsible bodies
- ✓ scaling up best practices/activity like washing their hands before milking
- ✓ identifying chemical content of utensil smoking plants(*Ejersa /Olia Africana*)
- ✓ evaluating the microbiological quality of milk at different level from the point of critical Control Hazard Analysis

To improve feed shortage and grazing land problem:

- ✓ List cost feed should be available for producers by respective bodies /organizations

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