Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.5, No.23, 2015

Assessment on Dairy Production, Post-Harvest Handling and Marketing Systems in Hamer Woreda of South Omo Zone

Bizuayehu Ayele Denbela Hidosa
Southern Agricultural Research Institute, Jinka Agricultural Research Center,P. O. Box 96 Jinka, Ethiopia

Abstract
The cross sectional assessment study on dairy production system and its constraints and opportunities was conducted in Hamer woreda of south omo zone with objective of assessing dairy production system, milk and milk products handling, processing and marketing systems. A total of 180 despondence households from six peasant association with 30 respondents per each peasant association were purposely selected and interviewed by using purposive sampling method. The primary data were collected through structured questionnaires form household pastoralists and focus group discussions and secondary data was collected from zonal and woreda pastoral office. In the study area around the 35%, 29 %, 35.5 %, 52 % and 28.4 % of cattle feeding, watering, dairy milking and selling of live animal activities in the study area was accomplished by house head and son whereas 45% and 64.8 % cleaning of the barn and churning of milk was performed by the wife. On the other hand, around 55.56 % and 26% respondents reported selling the milk and milk product carried out by females (wife and daughter). Pertaining to educational status around the 83.88 % of pastoralists were illiterate which unable to read and write, 10.55 % were learned the elementary school (1- 4) and 4.44% grade between 5- 8 and 1.11% learned grade 9 and 10 formal education. On the other hand, around 25 %, 19.44 %, 15.56% and 40 % respondent replied that the main source of income in the study area was generated from the sale of live animals, sale of animal product, live animal, crop and honey, sale of forest and forest products and mixed sale of different commodity. Similarity, around the 30 .55%, 15 %, 4.44%, and 50 % of respondent in the study area reported that they obtained milk from local dairy cow, goats, camel and both local dairy cattle and goat as milk source for human nutrition. In the study area different milking cow management attentions were implemented. Around, 36.4% respondents were replied that they have not provided any supplementary feed for their milking cows in addition to grazing on the natural pasture. However, around 63.6% of the respondents were replied that they allowed supplying feed sources for their milking cows like cutting of green grass, crop residue as supplementary feed source. On the other hand, 45.2% of the respondents were allowed their milking cows grazed with other animals in the grazing area and 32.9% respondents replied that they separately fed the milking cows from the other animals and also followed cut and carry system at home. Traditional hand milking is the only type of milking practiced and proper sanitary milking and handling practices were not followed and *Docha used* for milking, while *Dolla* and *Kill* used for storage and *kill* for milk churning and Shorka for marketing milk and milk products. The majority of the respondents around 88.2%, sell milk and milk products nearby dimeka market which the whereas around 4.2% of the respondents sell milk and milk products at home level to government workers who provide extensional and other service to communities. On the other hand, also around 0.7% sells milk and milk product to hotels at dimeka town and the rest 6.9% of the respondents sell to both at home and nearby market. A total of interviewed respondent around 33.33, 17.77, 16.67, 11.11, 8.33, 7.22, and 5.55% reported that the dairy cattle production in the study area was challenged and constrained by critical feed shortage dairy cattle diseases, recurrent drought, poor veterinary service, the lack of introduction improved dairy breed, lack of knowledge in milk and milk by product processing and lack of market channel respectively.
Keywords: Dairy production, Hamer woreda, Milk processing, Milk marketing and post-harvesting

INTRODUCTION

Ethiopia holds the largest livestock population in Africa, estimated at about 55.0 million heads of cattle, 27.3 million sheep, and 28 million goats, 1.1 million camels , 51.3 million chicken, 1.96 million horses 6.95 million donkey and 0.36 million mules (CSA, 2014). It is an integral component of the agricultural sector and makes an important contribution to the economy of the county (Gelan et al., 2012) with 15-17% of the total Gross Domestic Product and 35-49% of the agricultural share of the GDP (Sintayehu et al., 2010). Dairy production is among the sector of livestock production system has been played a vital role in human nutrition in rural and urban area of the country as being the sources of food (Layne et. al., 1990). The Milk produced from dairy cows plays an important role in feeding the rural and urban population and has high nutrition value. Milk is daily produced, sold for cash or readily processed in to butter, yogurt, cheese, whey etc and they are usually high energy yielding food products (MOA, 1998). According to the research work reported by Azage et al. (2000) indicated that the estimated number of milking cows in Ethiopia is about 9 million and are in the hands of small holder farmers and pastoralists under traditional management system. The milk production potential of the zebu breed in the highlands mixed crop-livestock system of Ethiopia cannot exceed 400-500 kilograms of milk per lactation per cow. The study district, predominantly pastoral production system well known in dairy production

with suited agro-ecology. However, there is lack of information in dairy production system, processing and post-harvest handling, dairy production constraints and opportunities and dairy product marketing system. Therefore it is imperative, identification of prevailing situation and understanding of the existing dairy production system in the area to devise appropriate development interventions. Therefore this study is initiated with objective of assess constraints and opportunities in dairy production system, post-harvest handling and marketing system.

Materials and methods

Description of the study area

The study was conducted in Hamer woreda of South Omo Zone which is located 755 km from Addis Ababa and 100 km from Jinka town. The woreda has a total number of 35 rural and urban 3 kebeles with 68,765 total human populations.The woreda has a total area of 696058 hectare of land and it is astronomically situated between $4^0.50'$-$5^0.47'$ N & $36^0.15'$-$36^0.90$ 'E with altitude ranges from 371–2084 masl. The mean annual temperature ranges between 29ºC–38ºC with mean annual rainfall 764 mm. Agro-ecologically, the Woreda is classified in to 54% lowland (Kolla), 37.5% Semi-Arid, 8% Woyinadega and 0.5% Desert type.

Sampling procedure and methods of data collection

The study was used 180 despondence households from six peasant association of Hamer woreda based on dairy cattle production, milking and milk by product pros sing practice in the study area. From each peasant association 30 respondents were purposely selected and interviewed by using purposive sampling method. Both secondary and primary data were collected. The primary data were collected through structured questionnaires form household pastoralists, key informants and focus group discussions and field observation methods. Secondary data will be collected from zonal and woreda pastoral office. The data were collected by enumerators and researchers with close follow up and monitored by the researcher. For household survey Cross-sectional survey was conducted using structured questionnaire. The data collected through the questionnaires included sex and age of the household head, family size, education level and economic variables such as land holding, livestock population, livestock production system, dairy production, challenges and constraints, and opportunities of dairy production, availability and source of livestock feed, total amount feed produced, feed management options, milk processing practices, source of milk, crop production system, cattle health delivery system, disease and parasites, housing, and livestock market situation, marketing constraints, marketing channel, access to market information and market opportunities, consumer preference and in the study districts. Pertaining to the focus group discussion in each of the interviewed kebele's, a total of three focus group was conducted using a checklist prepared for this purpose. The participants in the focus group discussions comprised of 6 -12 pastoralist of which about 2 – 6 were women. The participants of group discussion were selected by the aid of development agents in the kebele's considering their age and experience dairy production and dairy product processing practices. Specifically, they were drawn from pastoralists and kebele administrators. During the focus group discussion, important point such as agricultural activities practiced, dairy production system exist in the area and dairy product processing methods, feed and feeding management practice, feed source and utilization of communal feed resources and major constraints and opportunities for dairy production system and marketing situations, marketing channel, marketing constraints, and marketing opportunities

Data analysis

Both qualitative and quantitative data was collected on milk and milk products handling and marketing systems at household level were coded and entered in to the computer with statistical package for social science (SPSS version 16.). Descriptive statistics (frequency, percentage, mean, and counts were employed to analyze the data.

Results and Discussions

Table 1. Average grazing land holding in the study district

	privet grazing land		Common grazing land	
	Frequency	Percent	Frequency	Percent
yes	155	86.11	180	100
No	25	13.89	0	0.00
Total	180	100.0	180	100

Out of the total respondents interviewed in the study district, about 86.11% of respondents reported that they have their own private grazing land which they have started to graze when there was critical feed shortage period during dry seasons and whereas, the remaining the 13.89 % of the respondents reported that they have no private grazing land which allowed them to save their animals during critical feed shortage unlikely to former groups and they only forced to utilized communal grazing land only. Pertaining to the common grazing land in the study district, all (100 %) the respondents reported that they have utilized their grazing land commonly according to the rule that set by pastoralists 'communities

Table 2. Percentage of private grazing land utilization system (respondents = 180)

Private grazing land utilization system	Frequency	Percent
Pad docking	147	81.67
Cutting and carry	15	8.33
Shift grazing	28	15.55
Total	180	100.0

According to result the pastoralists in the study districts 81.67% of the respondents replied that they has been used their private grazing land by enclosure around the homestead and allowed their animal feeding through pad docking system and 15.55 % of the pastoralists uses their private grazing land through cut and carry system when there is a critical feed shortage during dry season especially for emaciated and young calves and the remaining around 8.33 % of the pastoralist utilized their private grazing land through shifting grazing system. The result obtained in the current study in agreement with previous research work that reported by Adumasu etal. (2010) and Alemayehu (1998).

Table 4. The grazing land productivity in the study area (respondents =180)

Grazing land status	**Grazing land productivity at presence**		**Grazing land productivity the last 5-10 years**	
	Frequency	Percent	Frequency	Percent
Increase	14	7.78	71	39.44
Decrease	156	86.67	109	60.55
Total	180	100.0	180	100.0

The productivity of the grazing land in the study area in the last 5 to 10 year around 60.55% pastoralist reported that there is consistently decrease in its productivity due to climate change which aggravated high rainfall variability and over grazing beyond the rangeland carrying capacity by the livestock and remaining around 39.44% the respondents reported that in the last 5 to 10 year increment in productivity of grazing land in the district due to the some certain interventions made by the different organization and awareness creation on the grazing land management to the area and some pastoral communities has engaged in grazing land enclosure. However, at the present around 86.67 % of pastoralist in the study area reported that the grazing land became shrinkage and started to decline in its productivity similarly due the climate change and only 7.78 % of respondents replied that there is increase in productivity of grazing land due to increase in practice of establish enclosures and awareness creation of pastoral communities

Table 2. Grazing species status in the study area (respondents = 180)

Species status	**palatable grass species**	
	Frequency	Percent
Increase	6	3.33
Decrease	174	96.67
Total	180	100.0

Conversely, 96.67 % pastoralist reported that palatable grass species decreased followed by the increase unpalatable bush and different acacia species which hinders the palatable(degreasers) productivity and alters production of livestock in the study area. The result in the current study in agreement with previous research work reported by different authors (Oba, G., 1998; Ayana, 1999 and Adumasu et al., 2010) and the remaining 3.33% of the respondents replied that increase of palatable grazing grass and some herbaceous species due to different unpalatable species eradication intervention strategies implemented by different organizations.

Table 3. Dairy herd compositions

Dairy Cows	Mean± SD
No. of dry Cows	4.16±9.24
No. of pregnant Cows	1.94±2.609
No. of milking Cow	3.34±2.99
No. of improved Cows	0.00
No. of Cows per HH	7.85±11.99
No. of cross Breed Cows	0 .04±0.50
No. of local Breed Cows	7.87±12

In the study district, there are different dairy herd compositions per house hold. According to respondent explanation, dry dairy and pregnant dairy cows per household on average mean and stander deviation (4.16±9.24) and (1.94±2.609) in the study area respectively. Conversely, local and milking dairy cow per household on average 7.87±12 and 3.34±2.99 respectively. On the other hand, there are no improved and their cross with local dairy cow in the study area which is need the government and NGO attention to study area.

Gender roles and Education status of HH

According to the result of survey in the study area in the Table 10 illustrated that the major occupation in the study area was work that related to the livestock rearing that based on both sex and age division which is in agreement with research result reported by Solomon *et al*. (1991). Majority of respondent replied that 35% and 29 % cattle feeding and watering was accomplished by Father and Boys respectively which is un likely previous research work reported by Adumasu (2010)which indicated that generally the activity of herding in the study area responsibility of all pastoral household member. Whereas 45% and 64.8 % cleaning of the barn and churning of milk was performed by the Mother and which is similar to what admasu (2010) reported in the study district . On the other hand, 35.5 % and 52 % milking and selling the live animal respectively also performed by Father and 28.4 % cow milking activity was performed by the Boys. Similarly, the interviewed respondent also replied that 13 % and 14 % role in selling of the live animal shared between Father and Boy, and Father and Mother respectively. Conversely, according to the respondent explanation, they reported that 55.56 % and 26% selling the milk and milk by product carried out by Mother and girl. In the study district there was some pastoralist became converted in the agro pastoralist way of living and they have been started to produce different dry tolerant crop varieties such as Maize and Sorghum on the home yard and in the irrigated area. During the crop production, similarly as livestock rearing, there are also work division based on sex and age among the house hold members. The 31 % and 10.3 % respondents replied that the Crop land preparation carried out by the Father and Boys in the house hold and remaining activity such as crop weeding and harvesting 33 % and 31.6 % respectively performed by both Father and Mother in the house hold. The remaining 37 % and 42.86 % of respondent replied that all house hold member participated Crop weeding and harvesting. Majority of the respondents in the study district replied that 83.88 % of pastoralists were illiterate which unable to read and write, 10.55 % were learned the elementary school (1- 4) and 4.44% grade between 5- 8 which means that they able to write and read and between grade 9 &10 formal education with 1.11% and the result obtained in the current study is un likely to the previous research work that reported by Adumasu(2010). Some respondents in the study area replied that why their participation in learning is less they reasoned that the majority their way of life is depends on live stock keeping, more house hold member paid attention in the rearing livestock in the last many decay however, at present, both government and none governmental organization promoted education, most of house hold especially children have being engaged in learning process and astonishing change has been seen around their vicinity .

Table 4. Educational status in the study area (respondents = 180)

Education level	Frequency	Percent
Illiterate	151	83.88
1-4	19	10.55
5-8	8	4.44
8-10	2	1.11
Total	180	100

Source: Owen survey

Table 5: Income source in study area (respondents = 180)

Source of income	Frequency	Percent
Sale of live Animals	45	25.00
Sale of Animal products, crops and honey	35	19.44
Sale of forest and forest products	28	15.56
Sale live Animal, Animal product, Crop and Honey	72	40.00
Total	**180**	**100.00**

The 25 % respondent replied that the main source of income in pastoral communities in the study area was generated from the sale of live animals in the individual base, which was accompanied by the 19.44 % and 15.56% sale of animal product, live animal, crop and honey and sale of forest and forest product . However, the largest source of income for the study area is mixed sale of different commodity (40 %) in line with different copying mechanism and us of different opportunities. The result obtained in the current study corroborated to what had been reported by different authors in different pastoral area in Ethiopia (Alemayehu, 1998; Abule, 2003 and Adumasu *et al*., 20l0)

Table 6: Sources of milk in study area (respondent =180)

Source of milk	Frequency	Percent
Cow	55	30.55
Goat	27	15.00
Cow and goat	90	50.00
Camel	8	4.44
Total	180	100.0

Around the 30 .55% of respondent in the study area reported that they obtained milk from local dairy cow whereas 15 % of respondents replied they used goats as milk source for human nutrition. On the other hand, very few (4.44) pastoralists Started to use camel as milk source that donated to them by the NGO. However, the largest (50%) share in milk contribution to the pastoralist's communities contributed from both local dairy cow and goats. On the other hand, 96.8% of the respondents also replied that they milked their cows twice a day where as the only 3.2% of the respondents milked once a day. Conversely, all respondent replied that the first milk (colustrum) used for the only feeding calves on average 7.98±7.09 days then they had being milking for feeding their family.

Feed resource base and feeding dairy cow

All respondents in the study area the livestock production depends predominately on natural pasture and range forages as basal diet and some pastoral communities were fed their animals with crop residues that obtained from sorghum and maize stover became increase its importance as livestock feed as annual rainfall increases. The most important feed resources available to livestock, is comprises of native grasses, browses and crop aftermath to a lesser extent (in agro-pastoral areas). Grasses are by far, the most important source of feed for livestock and other herbivores in the study area. Conversely, all respondent indicated that they have been followed on communal or private natural grazing and browsing, and cut-and-carry system during animal feeding systems. On the other hand, all respondent also indicated that they have no any practice of supplementing their livestock with agro industrial by product like a concentrate and improved forage species. However, they indicated that they have already a practiced of supplementing new born kids, calves and Sick animal with locally available range forage like acacia pod and different tree leaves as supplementary source especially during the dry seasons. On the other hand, all respondents also replied that they have not started the practice of feed conservation when during the excess feed availability and not yet been followed strategic feeding during the dry seasons. Migration is the foremost solution for pastoralists in the study area to alleviate critical feed shortage. Almost all respondents replied that they started migration during drought or dry seasons to area where feed available area like Omo park to save their animal for their existence

Milking dairy cows feeding system

In the study area different milking cow management attentions were implemented. As exemplary, 36.4% respondents were replied that they have not provided any supplementary feed for their milking cows in addition to grazing on the natural pasture. However, around 63.6% of the respondents were replied that they allowed supplying feed sources for their milking cows like cutting of green grass, crop residue as supplementary feed source. On the other hand, 45.2% of the respondents were allowed their milking cows grazed with other animals in the grazing area and 32.9% respondents replied that they separately fed the milking Cows from the other animals and also followed cut and carry system

Water source and watering frequency of dairy cows

In the study area, around 65 % the respondents replied that their animal gets water from river locally known as 'Chirosh' meaning water get out water from sand. On the other hand, around 13.33% and 21.11% of respondents reported that they get water for their animals from spring, pond and pipe which is constructed by none governmental organizations (NGOs). Pertaining to the frequency of watering of animals , the 56.11% of the respondents replied that their animal have daily access to watering and around 23.88% of the respondents replies that their animal have access to water twice per a day. The remaining around the 14.44% of respondents attested that their animals watered once for every two days. Some pastoralists implied that when animals get water once per two days that is good adaptation behaviors when they faced water shortage that is why they provide water once per two days for their animal

Table 7: Source of Water and watering frequency in the study area

Water source	Frequency	Percent	Watering frequency		
			Frequency	Frequency	Percent
River	117	65.00	Daily	101	56.11
Spring	24	13.33	Twice per day	43	23.88
Pipe and pond	38	21.11	Once per two day	26	14.44
Total	180	100	Total	180	100

Calf management practice and preferences

Calves are managed in a traditional way in the study district. Nursing calves were kept separate from their dams, except when they need to stimulate milk letdown during milking. According to the respondents clarification around the 98.7 % replied that they managed their calves by allowing to suckle before and after milked and allowed them to graze around home yard and the remaining 21.3% the respondents replied that they allowed only their calves to suckle milk letdown and concurrently, they forced to remove from their dams which is attested that poor calve management system in the study area. The average weaning age of calves in the study area is 11 months. However, weaning age is often influenced by different factors like the season of birth, the health status of the dam, breed and milking practice etc. The result obtained in the current study un likely to the finds that reported by Kedija Hussen (2008) who reported on average weaning age is 7.3 months for local animal and started to first calving at age of four year on average. Regarding to the issue of calf preference by the pastoral communities in the study area, around the 34% of respondents replied that they have preferred female calves than male calves why because they are reported that female calves were provide birth and milk which more important dairy production and breed coexistence and whereas around 25.5% of the respondents also preferred male calves for fattening, breeding and ploughing purpose. However, other 40.5% of the respondents replied that they were preferred both female and male calves by the reasoned that the combination effect very imperative to study area.

Milk and milk product handling

Traditional hand milking is the only type of milking practiced in the study area. Milking of cows mainly performed by male this activity is influenced by their local culture which is female did not engaged in cow milking. Generally proper sanitary milking and handling practices were not followed by the majority of the respondents in the study area. Although most of the respondents reported washing their hands and milking materials before milking, Washing of teats before milking is not practiced. Almost all of the households indicated that in case of cow milking, twice milking is a common practice in the wet season. The interviewed households used different materials for milking, storage and processing. All of the respondents reported using *Docha* for milking, while *Dolla* and *Kill* used for storage and *kill* for milk churning and Shorka for marketing milk and milk products. The pastoralists in the study area have been doing a conventional milk processing practices at the household level in order to produce butter, skimmed milk, yoghurt and Ayib. Respondents replied that they have a practice of produce milk products like butter to overcome the quality issue related to the shelf life of milk that obtained from cow; hence the fresh milk will not stay in fresh conditions. On the hand, in the study area, there was no milk and milk processing cooperatives and pastoralist involved milk and milk product processing traditionally at house hold level. They replied that they have not exactly known from what proportion of the skimmed milk produced from the whole milk and yoghurt production is on average how much percent of the total processed whole milk values. However, some respondent around 36% replied that they processed 0.5kg of butter from 7-10 liters of whole milk which is correlated with feed availability, feed type, seasons, dairy cow management and milking potential of dairy cows.

Performance of dairy cattle

The average milk yields /cow /day during the wet and dry season was 1.579± 0.71 and 0.728 ± 0.38 liters. This value is comparable with the national average of 1.54 liter/day per cow (CSA, 2008) and Lemma et al. (2005) also reported that the average milk yield of local Cows was 1liter /cow per day which is similar to the yield obtained during dry season in this study. On the other hand, all respondents replied that the milk obtained from goat was not known in its amount however, it is played important role in human nutrition mainly for babies and goat keepers. When the respondents plane to mate their cows during heat period some of the respondents select good performance of bull based on such criteria body condition, color and body size. Around 42.2% of the respondents replied that they have practices of bull selection during breeding season through natural mating and on the other hand, around 57.80 % respondents reported that they did not followed the practice of bull selection during the breeding of animals. Pertaining to the color preference, all respondents replied that they were preferred all colors except the black color during breeding time is issue related to bull with black color is difficult to search animals during grazing in bush land and during dark and also low preference during marketing and more susptable to the sun and unable to tolerated different disease like trypanosomiasis and other diseases. On the other hand, indigenous zebu breed cows, which is predominantly found in the study area that exhibited with low milk productivity potential with the average lactation length that influenced by the season of feed availability on was 5.62±3.4 months which is comparable to what reported (CSA, 2015) at national level .

Milk consumption trend and marketing

The main milk and milk by products consumption trends in the study area is depends on type of milk and milk products. The respondents that interviewed in the study 23.7 % replied that the main objective of the keeping dairy animal in to their vicinity were to obtain milk and milk product such as Butter, yoghurt, were produced and consumed. However, the cheese (*ayib*) which is in other area of country which is more familiar but not known and produced in the study area due to the pastoralists have not skill and knowledge to process it from the

whole milk and have not trends consume it. Pertaining to the milk and milk consumption trends, 70.5 % respondents reported that they have trends of consumed a daily a whole milk, fermented milk aryugut and other milk products at all house hold level during the wet season when the feed availability became in excess. Conversely, 26.2 % of respondent reported that they have a trend to utilized milk and milk products at all house hold level some time due to they have not enough cows that provide enough milk to the all house hold level and productivity poorness of milking cows. On the other hand, around the 3.4% of the respondents replied that they have a trend of utilized the milk and milk product two times per a week at house hold level. But during dry season mainly for sell rather consume at house level because during dry season there is low production of milk and high cost of milk and milk product on local market.

Table 8: Milk production status per seasons

Milk production status	**Wet season**		**Dry season**	
	Frequency	Percent	Frequency	Percent
Increase	4	2.22	0	0
Decrease	137	76.11	150	83.33
Same with past	39	21.66	30	16.67
Total	180	100.00	180	100

Source: Field survey

Pertaining to the milk production status in the study area revealed that around 76.11 % of interviewed respondent attested that there is highly decrease in milk production potential of dairy cow wet season when they compared with past in same season, the reason pastoralists raised even though season is wet duration of season is become short and availability and access of range forage to livestock is low so that makes low dairy milk production. Conversely, there was a concurrent reduction in milk production during dry season also explained (83.33 %) by the pastoralists when the compared with last decay in due to the dramatically climate change in which aggravated with in decline the rangeland productivity increase contagious diseases and parasitic infections. Meanwhile, around 21.66 % and 16. 67 % respondent replied that there was no change in the milk production when they compared with past yield in the both wet and dry seasons in to the study area.

Milk and milk product marketing

Milk and milk product marketing is primary issued in study area used to fulfill their main basic needs require for their livelihood. All pastoralists secured the issue of food security through selling the milk and milk product and then purchase Crops, clothes and medicine for their livestock. Some are pastoralists also assured that the issue of social need such as payment for marriage when their relative and neighbors are in position of marriage. Regarding to the issue of production and marketing of wholesome milk and milk products, around 85% respondent replied that they not faced the problem of the perish ability since milk and milk product sold near the Dimeka market, which is the terminal market, for the all milk sellers (Milk producers) and is all women and some time girls involved in selling process and the remaining 15% replied that they have faced a problem of a moderate milk and milk product perish ability due long distance journeys to the dimeka market specially during the dry seasons and lack of modern technologies and awareness creation to increase milk and milk product shelf life. On the other hand, there was no intermediary trader in to the area where milk and milk product produced and transported to the terminal market (Dimeka town market). The majority of the respondents around 88.2%, sell milk and milk products nearby dimeka market which the whereas around 4.2% of the respondents sell milk and milk products at home level to government workers who provide extensional and other service to communities. On the other hand, also around 0.7% sells milk and milk product to hotels at dimeka town and the rest 6.9% of the respondents sell to both at home and nearby market. Pertaining other milk product like butter and butter milk around, 65.4% of the respondents replied that they have practiced of selling of the butter milk however, the remaining the 34.6% of the respondents replied that they have no practice of selling the butter milk. On the other hand, conversely, around 98.6% of the respondent believed that butter is more marketable than milk during especially the dry season and holy days to vicinity. The cost of butter is more expensive during the dry season and the cost of butter is depends on the quality that considered during handling and processing systems. Result in the current study similar to what Laval and Assegid(2002) reported. On the other hand 64.3% of the respondents reported that they have trend of exchange butter by goat through argument with between two. The majority of the respondents (71.2%) adapted waiting of holydays to sell their butter at expensive cost however, the 28.8% of the respondents were not practice this trend.

Milk and milk product marketing channel

In the study area, there is no moderate formal market channel and value chain of milk and milk product between producers (pastoralists), traders and consumers. However, the milk and milk product is processed and transported from the village to the dimeka town for selling to utilize for different activities. There is no practice of selling milk and milk product at village level. With regards of marketing channel of milk and milk product, there is involvement of different factors such as pastoralists (producers), traders and consumers. Generally, there are two market channels of milk and milk product in the study area such as milk and milk product transport from

production site (village) to Dimeka market and from Dimeka market to the dimeka town hotels and dimeka town consumers. Conversely, channels from the Dimeka market to the Jinka market which is largest market in zone then to end consumers. Pertaining to milk and milk product value chain analysis in the market channel, all respondents reported that they have no awareness in undertaking market value chain process in milk and milk products which is need the different market channel intervention in market value chain analysis. During milk and milk product market channel, the determination of the price of milk and milk product is commendable issue. Around 43.4% of pastoralists (respondents) reported that the price of the milk and milk products price determination based on decision of the producers(pastoralists) whereas the around 42.6% of milk and milk product price determination mainly undertook the negotiation between producers(pastoralists) and buyers(traders) and the rest of the price is determined by market by itself and other factors **Constraints and opportunities of dairy production**

Table 9: Constraints of dairy production in study area (respondent = 180)

Constraints and challenges	Frequency	Percent	Ranks
Lack of improved dairy breed	13	7.22	6
Feed shortage	60	33.33	1
Livestock diseases and parasites	32	17.77	2
Poor veterinary service delivery	20	11.11	4
Recurrent drought	30	16.67	3
Lack of market channels and value chain	10	5.55	7
Lack of knowledge in milk and milk product processing	15	8.33	5
Total	180	100.0	

The dairy production in the study area driven by both anthropogenic and natural factors which negatively affected the productivity and production performance. According to result obtained from current survey depicted that around 33.33 % of the sampled households in study districts reported that a critical feed shortage is the first bottle neck to the dairy production to the area especially during the dry season that started from mid November to January. The dairy productivity is entirely depends on the feed, the respondents in the area believed that feed scarcity could be resulted due to anthropogenic factors such as less attention given by the pastoral communities in protecting the communal natural pastures and they allowed grazed communal pasture land beyond its carrying capacity (over grazing) that makes the down ward the productivity of natural pasture land this aggravated to low dairy production. The other reasons that issue regarding to the scarcity of feed, in the study area risen by respondents is that scarcity of feed driven by the dramatically change in climate that aggravated by erratic rainfall pattern that put its negative impact in deterioration of in rage forages. The result reported from the interviewed respondent in the current study is similar to what is mentioned by different authors in the country (Mengistu, 2002; Mengistu and Amare, 2003; Zegeye, 2003; Amede et al., 2005; Duguma et al., 2012). Conversely, all respondents followed different mitigation strategies during the occurrence to the critical shortage of feed to solve the problem that are in line with the general situations prevailing across the rangelands in Ethiopia that reported by the Alemayehu (1998) and Abule (2003). On the other hand, around 17.77 % of respondents were reported that animal diseases (Trypanosomiasis, Blackleg, Gastrointestinal tract, Lungworms, Mastitis, Brucellosis, Milk fever, Liver fluke and Udder trouble) and parasites such as internal worms and external parasites such as different Tick species was the most challenging constraints to the dairy production to the study area next to the critical feed shortage. Conversely, the other reaming around 16.67 % respondents replied that the impacts of frequent drought study areas the third important constraints that challenged the dairy production potential by the leading to dairy production yield in decline, decline in the quality of pasture and reduced vegetation cover and placed pastoral communities less benefits from dairy animal and made food insecurity and put their children malnutrition status. Indeed, also the deliver and the governance of veterinary service is the crucial factors in the livestock production especially in dairy industry due to high exposure of dairy animals to diseases and parasites; hence, in the study district, around the 11.11% of pastoralists reported that their dairy animals affected by the due to poor veterinary service that delivered to their vicinity even though, the government and NGO are in the position of constricting and installing veterinary clinics and followed mass animal vaccination programs, the way of sedenterization so being scattered that make unable to get the service easily and they walked the long distance to get veterinary service. Others also around the 7.22, 8.33, and 5.55 % reported that their dairy production challenged by the lack of introduction improved dairy breed, Lack of knowledge in milk and milk by product processing and lack of market channel to sell dairy products due to lack of training and awareness creation.

Opportunities in dairy production

Dairy production in the study district played a pivotal role to the pastoral communities. There are many and diversified agro ecologies, dairy cattle breeds that have ability to resist available environmental condition, increment in Milk and milk product Consumers demand, increment of market price in milk and milk product,

improvement in veterinary input and service, improvement in agricultural extension service, availability of transportation for milk and milk product marketing, availability of terminal markets near to their vicinity, existence of different developmental actors(NGO), indigenous knowledge of pastoral communities in dairy cattle management and mitigation strategies and pastoral police development and strategies were an opportunity for cattle production in the study area.

Conclusion and recommendations

The current study indicated that educational background of pastoralists in the study area less educated which put dairy and other cattle reared low benefits from the sector due to the poor livestock management. The dairy cattle management system is traditional pastoralism system which leads dairy cattle in low producing condition which resulted due poor management system such as feeding, watering, housing, health caring, etc. The availability and quality of feed, disease and parasites, lack of improved dairy breed, recurrent drought due to variability in rainfall, poor veterinary service delivery, lack of milk and milk product market channel and lack of awareness in processing of milk and milk product are most important constraints to the dairy cattle production even if the diversified opportunities for dairy production to the area. There is dramatically decline in rangeland productivity thereby concurrently decline in milk and milk product which put pastoral communities livelihood unsecured in the study area. Similarly, there were no dairy cattle supplements with different supplementary feeds such as different agro industrial by product and other improved forage interventions. Milk and milk products were mainly used for home consumption where butter was the major product sold at local market to secured different issues like purchase food crops, medicine for livestock and human health and other social obligations .There were also no modern milk and milk product processing practice and milk collection centers in the study area. On the other hand, pastoralist communities predominantly depend on the local dairy breed which is poor milk production performance. From the current study it recommended that, the sustainable, participatory and practical trainings shall be provided for pastoral communities and agricultural extension workers should be capacitated. There is poor milk and milk product marketing channel in the study area therefore, government and NGO give in attention in dairy cooperatives establishment, milk collection center, milk processing plants establishment, formal milk and milk product market channel and introduction in milk and milk product value chain system. Introduction of different feed improvement interventions, modern veterinary service delivery system and dry cattle breed improvement through the artificial insemination services, improved breed bulls center establishment and cross heifer distribution need also attention to the study area for better productivity and to improve reproductive performance of locally existing dairy cattle.

References

Abule Ebro, 2003. Rangeland evaluation in relation to pastoralist's perceptions in the Mid-Awash rift valley of Ethiopia. A PhD Dissertation submitted to University of Free State, Bloemfontein, South Africa. 232p.

Admasu Terefe, 2010. Pastoralists perceptions on range-livestock management practices and rangeland assessment in Hamer and Benna-Tsemay Districts of South Omo Zone. An MSc. Thesis Presented to the School of Graduate Studies of Alemaya University, Ethiopia. 159p.

Ahmed Sheik, M., B.P. Hegde and Asefa Asmare, 2005. Reproduction breeding and management of female and male camels in Afder zone of Somalia regional State, Ethiopia. Pp 67-76. In: Participatory Innovation and Research: Lesson for Livestock Development. Proceeding of the 12th Annual Conference of Ethiopian Society of Animal Production (ESAP), 12-14 August, Volume II, Addis Ababa, Ethiopia

Alemayehu Menigistu, 1998. The Borana and the 1991-92 droughts: A Rangeland and Livestock Resource Study. Institute for sustainable development, French Catholic committee against hunger and for development. Addis Ababa, Ethiopia. 90p.

Ayana Angassa, 1999. Range condition and traditional grazing management in Borana Ethiopia. MSc.Thesis, Presented to the School of Graduate Studies of Alemaya University, Alemaya, Ethiopia. 73p.

Azage Tegegne, Tsehay Reda, Alemu Gebrewold and Hizkias Ketema, 2000, Milk Recording and Herd Registration in Ethiopia In: Pastoralism and Agropastoralism: Which way foreward? Proceedings for the 8th annual conference of the Ethiopian Society of Animal Production. (ESAP) held in Addis Ababa 24-26 August 2000, Addis Ababa. P 90.

Belay Duguma, Azage Tegegne and B.P. Hegde (2012) Smallholder Livestock Production System in Dandi District, Oromia Regional State, Central Ethiopia. Global Veterinaria 8 (5): 472-479, 2012 ISSN 1992-6197.IDOSI Publications, 2012.

CSA (Central Statistical Authority) 2008/09. Agricultural Sample Survey of (2008/09). Volume IV. Report On Land Utilization (Private Peasant Holdings, Meher Season) Addis Ababa, FDRE

MOA (Ministry of Agriculture),1998. The role of village dairying co-operative in dairy development: for improving dairy in Ethiopia, Smallholder

Oba, G., 1998. Assessment of Indigenous Range Management Knowledge of the Borana Pastoralists of Southern Ethiopia. Borana Lowland Pastoral Development Program/GTZ Consultancy paper. Negelle/Borana,

May 199 Solomon Bekure, P N. de Leeuw, B. E. Grandin and P. J. H. Neate (eds), 1991. Maasai herding: An analysis of the livestock production system of Maasai pastoralists in eastern Kajiado district, Kenya. ILCA Systems Study 4. ILCA (International Livestock Centre for Africa), Addis Ababa, Ethiopia. p172.

Zegeye Yigezu, 2003. Challenges and opportunities of livestock marketing in Ethiopia. In: Proceeding of the 10th Annual Conference of Ethiopian Society of Animal Production (ESAP) 22-24 August 2002. ESAP, Addis Ababa, Ethiopia. 47-54 pp.