

Constraints and Opportunities of Dairy Cattle Production in Chench and Kucha Districts, Southern Ethiopia

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Abstract

This study was conducted in eighteen kebeles of Chench and Kucha districts of Southern Ethiopia with the objective to assess the challenges and opportunities of dairy production. Multi-stage purposive and simple random sampling procedures were implemented at three stages. A total of 266 households were involved as respondents and 133 respondents participated in each district and data were collected through structured questionnaires. *Most important challenges of dairy production in the study were feed shortage, disease and parasite, poor breed improvement practices and lack of experience in improved dairy cattle management.* This study revealed that 66(49.6%) and 65(48.87%) respondents in Chench and kucha respectively indicated that shortage of animal feed is the most important problem hindering dairy development. *The main reasons for feed shortage indicated by the respondents were cultivation of grazing lands, declining yields of grazing land and increase of livestock population. Although many problems and constraints that may hinder the development of the dairy sector were identified in the area, the interviewed households of both study areas (69.17%) and (24.81%) Chench and kucha respectively were willing to continue, expand and/or involve in dairying in the future.*

Keywords: Dairy, challenges, opportunities

Introduction

Livestock provide a significant nutritional supplement to vulnerable groups, increase the resilience of smallholder households in the face of food crises, and help to maintain traditional social safety nets (Randolph *et al.*, 2007). However, they constitute only a limited part of most people's diet in Ethiopia. Smallholder dairy farmers produce the bulk of milk available for processing. Milk and milk products play a very important role in feeding the rural and urban population of Ethiopia and have a high nutrition value and is daily produced, sold for cash or readily processed. It is a cash crop in the milk-shed areas that enables families to buy other foodstuffs, contributing significantly to the household food security. Given the long tradition of using milk and milk products by the Ethiopian society, there is no doubt that increasing smallholder dairy production and productivity would bring about a conspicuous impact on improving the welfare of women, children and the nation's population at large. Despite its potential for dairy development, productivity of the dairy sector in Ethiopia is generally low and the direct contribution it makes to the national economy is limited. For example, in 2009 average cow milk production was estimated at only 1.54 litres/cow per day (CSA 2009). This were due to the fact that dairy production has been hampered by multi-faceted, production system-specific constraints related to genotype, feed resources and feeding systems, access to services and inputs, low adoption of improved technologies, marketing and absence of clear policy support to the sector (Azage *et al.*, 2013). The lack of up-to-date and location-specific information on production and marketing systems and constraints is often a major limitation to productivity and production improvement endeavors in Ethiopia (Ayele *et al.*, 2003). Characterizing the existing situations in relation to production and health constraints and opportunities in a specific area is crucial for further interventions. Therefore the objective of this study was to assess constraints and opportunities of dairy cattle production in Chench and Kucha districts southern Ethiopia.

Materials and Methods

Description of the Study Areas

Study was conducted in two districts of southern Ethiopia, namely Chench and kucha, which are situated in Gamo Gofa zone and respectively represents the highland and lowland agroecologies.

Chench District is situated between 1300 m and 3.250m above sea level. Astronomical location of Chench wereda is between 37° 29' 57" East to 37° 39' 36" West and between 6° 08' 55" North and 6° 25' 30" South. Due to a high altitudinal range, the area is characterized by diverse agro-climatic distribution and vegetation cover. This District is divided into two agro-ecological zones, namely, Dega and Weyna Dega, which account for about 82 and 18% of the total area respectively. Due to its rugged topography the highland area is very vulnerable to soil eroding forces. The rainfall regime in the District is bimodal. The first round of rain occurs between March to April. The second round of rain occurs from June to August. The rainfall distribution in Chench varies from year to year and across seasons. The annual rainfall distribution in the district varies between 900 mm to 1200mm. The minimum temperature in the District ranges from 11 to 13 degree centigrade, while the maximum temperature is in the range 18 to 23 degree centigrade. The farming system in the District is

a mixed farming system where the crop sub-system and the livestock sub-system are equally important to each other. Due to low natural fertility, low amount of available nutrients and low permeability of the clay or clay loam soils of the highland, soil fertility maintenance is the number one priority to every farmer in the highland.

Kucha district is known for hilly and undulating midland and upper lowland terrain; due to terrain and weather patterns, less than one in five households is food secure. Food crops include maize, enset, sweet potatoes, taro, teff, and yams; income sources include butter and selling firewood. Based on figures published by the Central Statistical Agency in 2005, this district has an estimated total population of 145,305, of whom 72,159 are men and 73,146 are women; 3,498 or 2.41% of its population are urban dwellers, which is less than the Zone average of 8.5% With an estimated area of 1,384.22 square kilometers. The largest ethnic group reported in Kucha was the Gamo (98.52%); all other ethnic groups made up 1.48% of the population. The majority of the people practice mixed farming (crop and livestock production).

Sampling Methods and Data Collection

In order to characterize the dairy production systems and identify the bottlenecks of dairying in the areas, farmers/producers were interviewed using pre-tested structured questionnaires. Multi-stage purposive and simple random sampling procedure was implemented at three stages. In the first stage, kebeles were identified and after having livestock population data (cattle) at each kebele in the two districts and ten kebeles in each district were selected purposively based on cattle population and access to infrastructure (road). In the second stage, individual households owning dairy cows of any breed and size were identified and listed in selected kebeles. In the third stage, individual dairy cow owner households were randomly selected from the list for an interview. The total number of households interviewed on the dairy production system was 266 comprising 133 households from each district. The data collected included information on household demography, herd composition, major constraints and opportunities for production of dairy in the future and marketing.

3. Statistical Analysis

Data collected was analyzed using Statistical Package for the Social Sciences (SPSS 2006). Survey results were analyzed using descriptive statistics.

Result and Discussion

Demographic characteristics

The average family size of the households was 6.7+0.11 and 6+0.15 for Chencha and Kucha districts respectively. In both districts almost all the household heads (97.74% in Chencha and 100% in kucha) are married. Demographic characteristics of the households are presented in Table 1.

Table 1 Characteristics of the Respondent households in the study area

variables	Chencha woreda		Kucha woreda		
	Frequency	percent	Frequency	percent	
Sex	Female	45	33.83	2	1.5
	Male	88	66.17	131	98.5
	Total	133	100	133	100
Age category	25-40	51	38.35	80	60.15
	41-55	57	42.86	45	33.83
	56-70	19	14.29	5	3.76
	71-85	5	3.75	1	0.75
	Total	133	100	133	100
Marital status	Married	130	97.74	133	100
	Single	3	2.26	0	0
	Total	133	100	133	100

Livestock holding in the study areas

In Kucha areas except in Kuto kebele in all other kebeles 131 (98.5%) of respondents do not have experience with cross breeds of cattle where as only 2 respondents (1.5%) reported that they have Jersey cross breed oxen. On the other hand in Chencha woreda also this study showed that 72 (54.14%) respondents have local cattle breeds only whereas 61 (45.86%) respondents reported that they have Cross cattle breeds. Findings by Fikrineh *et al.* (2012) explain that out of the interviewed farmers across the districts only 40% had crossbred cows. In contrast the results of this study showed that there is greater number in Chencha areas and less number of cross cows in kucha areas.

The study revealed that number of goats owned by the respondents in the study areas of Chencha woreda range from 0-7 and in kucha woreda their number is reported between 0 and 12 with average number 0.15

± 0.81 and 3.1 ± 2.5 in Chencha and kucha woredas respectively. In contrast to the current study finding an average number 0.23 ± 0.13 of local goats which was investigated by Asaminew and Eyassu (2009) is greater than the average number of local goats in Chencha and less than average number of local goats in kucha woreda.

The study revealed that certain numbers of horses are being owned by 23.31% the respondents in the study areas of Chencha woreda with average number of 0.29 whereas almost negligible (0.75%) of the interviewed households replied that they have an average number (0.01) in study areas of kucha woreda. From the report in kucha woreda none of the respondents have mules whereas in study areas of Chencha woreda respondents stated that they own an average number of 0.02 ± 0.15 mules. There is variation in the number of animals might be associated with the agro climatic conditions of the districts. Similarly, Asaminew and Eyassu (2009) reported average number 0.24 ± 0.06 mules in Bahir Dar Zuria and Mecha Districts.

Dairy Production Constraints in Chencha and Kucha Districts

Farmers rearing cattle in the study areas face a range of technical, socioeconomic and institutional constraints. Feed shortage, disease and parasite, lack of extension support, poor knowledge in animal management and lack of capital are some to mention. Major constraints of sheep and goat production in the study are given in table 2. Major constraints affecting dairy production vary in the two districts in priority. Feed shortage is the number one problem in Chencha followed by disease. While in kutchu the reverse is true (disease is the number one problem followed by feed shortage). This variation might be due to agro ecological differences of the districts (Chencha is a highland district while kucha is lowland dominating).

As observed in the table (2) below 66(49.6%) and 65(48.87%) respondents in Chencha and kucha respectively indicated that shortage of animal feed is the most important problem hindering dairy development. Similarly, 42% of the respondents in western oromia reported feed shortage as the most single problems responsible for low milk yield and low productivity of the dairy system (Ulfina et al., 2013). The same author showed that about 58% of the proportions of the respondents indicated feed shortage in combination with diseases and poor genetic make-up of indigenous animals as a primary cause for lower productivity. Contrary to this, 18.3 % of respondents in Bahir dar zuria and mecha districts revealed feed shortage as a constraint for milk production (Asaminew and Eyasu 2009). Similarly 41(30.8%) and 32(24%) of respondents respectively in Chencha and kucha districts state that disease and parasite are their primary problems hindering dairying activities.

Table 2. Major dairy production constraints in Chencha and kutchu districts based on respondent's priority

Constraints	Chencha	Kucha	Over all
	N (%)	N (%)	N (%)
Feed shortage	66(49.6)	65(48.87)	131(49.3)
Disease and parasites	41(30.8)	32 (24)	73(27.5)
Poor breed improvement practices	11(8.3)	13(9.3)	24(9)
Poor knowledge of improved dairy management	15(11.3)	23(17.3)	38(14.3)

Feed Shortage

The primary constraints to increased milk production under all dairy production systems are inadequate feed resources, poor pasture development and the ever increasing feed prices. Farmers tend to keep cattle at stocking rates that far exceed the carrying capacity of their grazing lands. This has resulted in degraded pastures and eroded soils. Stock numbers are not normally reduced in the dry season leading to grazing lands becoming progressively overgrazed. In the dominating crop/livestock production system, producers supplement the feeding of their dairy cows with crop residues and farm by-products from their farms. In some cases, during the dry season, these feedstuffs can be the only feeds available to the animals. However, the improvement of the utilization of these feedstuffs through physical and chemical processing methods to increase the availability of nutrients is only practiced on a limited number of farms.

The reasons for feed shortage are indicated in table 3. In this study the main reasons of feed shortage indicated by the respondents were cultivation of grazing lands, declining yields of grazing land and increase of livestock population. Shrinking sizes of the grazing lands driven by the expansion of land cultivation was reported to be the leading reasons for feed shortage across all the study. Declining yield and carrying capacity of the grazing lands was rated as the second important impediment in adequate supply of feeds across all the sites. Increases of human and livestock population and drought are also mentioned to cause feed shortage.

Table 3. Reported reasons for feeds shortage based on respondent's first priority

Reasons	Chencha (N=133)	Kucha (N=133)	Over all
	N (%)	N (%)	
Declining yields of grazing land/over grazing	22(16.5)	27(20.3)	49(18.4)
Increase of livestock population	15(11.3)	14(10.5)	29(10.9)
Cultivation of grazing lands	88(66.2)	67(50.38)	155(58.3)
Drought	8(6)	22(16.5)	30(11.3)

As indicated from the table (2), 66.2% and 50.38% of respondents respectively in Chencha and kutch reported cultivation of grazing land as the main cause of feed shortage. Similarly 16.5 and 20.3 % of respondents in Chencha and kucha revealed that declining yields of grazing land as a reason for feed scarcity.

Diseases and parasites

Majority of the respondents 52 (39.09%), 37 (27.82%), and 28 (21.05%) in Chencha district ranked anthrax in 7th, 8th, and 6th positions meanwhile by 20 (15.04%), 19 (14.29%), 14 (10.53%) respondents ranked anthrax in 6th, 9th, and 8th positions. Anthrax reported to be a major disease affecting livestock production and productivity in the area (Jiregna et al., 2013). Highest number (49, 36.84%) and (80, 60.15%) of the interviewed households in study sites of Chencha and kucha districts respectively ranked black leg in 5th position. Blackleg reported to be a major disease affecting livestock production and productivity in the area (Jiregna et al., 2013). Study of Tesfaye (2007) showed in Cotton based farming system 5.4%, in Sesame based farming system 6.0%, and in Gendawuha 4.0% of respondents stated that occurrence of blackleg was one health problems in their animals.

Highest number (43.6%) of respondents in Chencha area ranked internal parasites in 6th position whereas largest number (16.54% of interviewed farmers) ranked this disease in 3rd position. Internal parasites reported to be a major disease affecting livestock production and productivity in the area (Jiregna et al., 2013). 39.09% and 18.05% of interviewed farmers in the study sites of Chencha and kucha districts respectively considered external parasite infestation as one of vectors of diseases causing agents and ranked them in 4th place. External parasites reported to be a major disease affecting livestock production and productivity in the area (Jiregna et al., 2013). Study of Tesfaye (2007) showed in Cotton based farming system 16.1%, in Sesame based farming system 40.0%, in Gendawuha 68.0% of respondents stated that tick infestation was one health problems in their animals.

58.65% and 31.58% of interviewed households in the study areas of Chencha and kucha districts respectively considered bloat as one of serious health problems of their cattle and placed it 2nd ranking position. In agreement to the current study bloat reported to be a major disease affecting livestock production and productivity in the area (Jiregna et al., 2013). The highest percentage (41.35%) of respondents in study areas of Chencha considered pinkeye as one of important diseases in dairy cattle and ranked it in 3rd place. Similarly highest percentage of interviewed households (39.1%) in the study sites of kucha district Pinkeye one of common diseases of dairy cattle and considered it 1st ranked position. In this study 29.32% (39), 24.81% (33), 24.06% (32), 18.05% (24), and 3.76% (5) of the respondents in Chencha district ranked foot and mouth disease in 8th, 1st, 4th, 3rd, and 2nd positions respectively whereas in kucha district 17.3% (23), 15.79% (21), 13.53% (18), 12.03% (16), 12.03% (16), 9.77% (13), 9.77% (13), 4.51% (6), 2.26% (3), 2.26% (3), and 0.75% (1) of the respondents ranked it in 1st, 4th, 5th, 6th, 8th, 7th, 8th, 9th, 3rd, 10th and 2nd positions respectively. Study by Tesfaye (2007) showed in Cotton based farming system 12.5%, in Sesame based farming system 17.3%, and in Gendawuha 12.0% of respondents stated that occurrence of foot and mouth disease was one health problems in their animals.

In this study the highest number (95,71.43%) and considerable number (20,15.08%) of the interviewed households in Chencha and kucha districts respectively replied that mastitis is ranked in 1st position whereas highest number (45, 33.83%) of respondents in study sites of kucha district ranked it in 4th place. About 44, 39, 21, 52, 50, 39 and 3 % of respondents from Ambo, Baddalle, Dambi Dollo, Gimbi, Jimma, Mattu and Naqamte, respectively showed high incidence of mastitis in the area. In that order, 50, 46, 54, 42, 38, 50 and 45 %, respectively reported low to medium incidence of mastitis problem (Jiregna et al, 2013). Trypanosomosis as serious cattle disease is ranked 1st by 75.2% of interviewed farmers in study areas of kucha district.

23 (17.29%), and 66 (49.62%) of the interviewed households in study sites of Chencha and kucha districts respectively mentioned that abortion is greater in local breeds than in cross breeds. Abortion in cross cattle is observed by 25 (18.8%) respondents in the study areas of Chencha district whereas all respondents in kucha areas stated that they do not have information on problems related with abortion in these cattle breeds. 28 (21.05%) respondents in the study areas of Chencha district explained that abortion is similar in both local and cross breeds. In principle difficulties of parturition is of various origin. 35 (26.31%) and 54 (40.6%) respondents in the study areas of Chencha and kucha districts respectively mentioned that Difficulties of parturition is seen in local breed. Out of 133 selected households in the study areas of Chencha district only 14 (10.53%) respondents reported that difficulties of parturition are seen in cross breed.

Out of 133 selected households in the study areas of Chencha district considerable number and proportion 51(38.35%) respondents reported that difficulties of parturition is similar in local and cross breeds. Majority of the interviewed households 92 (69.17%) in study areas of Chencha district said that they will expand their cattle number in contrast to this in the study sites of kucha district less significant number 33 (24.81%) of the interviewed households replied that they will expand their cattle number in the future. In study area of Chencha district 51(38.35%) and 37 (27.82%) stated that they intended to expand their cattle number because of the opportunities such as high demand for milk and milk products by the community as a whole and also due to encouraging increase of milk price from time to time.

Poor Breed Improvement Practices

In the study areas particularly remotely far kebeles of kucha, respondents have a problem of getting AI services through which they can upgrade the genetic makeup of their low producing dairy animals. This is in agreement with money other reports in Ethiopia. Azage et al. (2013), for example reports that the number of crossbred cows is very low and is mainly concentrated in and around major urban and peri-urban centres. Tsehay (1997), reported about 99% of the cattle population in Ethiopia are indigenous that are adapted to feed and water shortages, disease challenges and harsh climates. Similarly it was outlined that the use of AI has also failed in many situations in developing countries because of the lack of infrastructure and the costs involved, such as for transportation and liquid nitrogen for storage of semen or because the breeding programme has not been designed to be sustainable (Philipsson et al., 2011).

Poor Knowledge of Dairy Cattle Management

Level of management achievable in Ethiopia is unfavorable to higher exotic inheritance levels than 50%, milk production, lactation length and calving interval decreased or remained constant in higher cross inheritance from 50% crossbreed, while gross country milk production increased (Addisu, 2013). In the study areas, Chencha and kucha districts respectively 27% and 31 % of respondents do not have awareness about the modern level of dairy cattle management (particularly feeding and housing) feeding which is attributed to high level of animal performances in terms of both growth rate and milk yield.

Miscellaneous Problems

Reproductive problems identified that seriously affect dairy cattle performance are, abortion and late age at first mating. In addition to these, low rate of conception particularly with local breed cows that bred using AI services was the major issue for dairy development in both districts. It was understood during the present study that producers question on the efficiency of AI technicians due mainly to low conception rate. There is little/no work done to build the capacity of AI technicians in both Chencha and kucha district. Most households use natural mating by local bulls because of different factors. These factors include: access and inefficiency of AI service, access of breeding bull, number of services required till conception, knowledge of estrus detection. There are also different factors that hamper dairying in the area, which includes: scarcity of capital or credit to expand the farm, poor extension service to dairy producers. Most producers in the area had never been given any training and/or extension services. The areas that should be supported by training lies on improved dairy cattle management which includes feed production and conservation techniques, feeding systems, housing, basic animal health, reproductive management, milk handling and processing, and record keeping practices.

Improvement in the livestock sector by enhancing the quality and quantity of feed, and improved extension services, increasing livestock health services and improved productivity of local cows by artificial insemination while preserving the indigenous breeds has to put in to effect (Mohamed et al., 2007).

Opportunities of Dairy Farming in Chencha and Kucha

Although many problems and constraints that may hinder the development of the dairy sector were identified in the area, the interviewed households of both study areas (69.17%) and (24.81%) Chencha and kucha respectively were willing to continue, expand and/or involve in dairying in the future. Dairy farming supports livelihoods of society under low input production system, generates income and creates employment opportunity under market-oriented production system. Other opportunities are increasing ever sustaining demand by the community for milk and milk products and encouraging price for these products. Particular attention should be paid to increasing the role of women in dairy development, since the study shows that they play a major role in dairy production and marketing. Chencha areas and areas in high altitudes in kucha district are suitable for exotic cattle breeds. The existence of the various institutions involved in dairy research and development across the different parts of the country is an opportunity to come up with a solution for challenges that constrain dairy production and for low uptake of dairy technology in the country. In Ethiopia there is strong culture of consumption of dairy products. In addition to raw milk, milk products such as butter, cottage cheese, fermented milk (yogurt), whey are also commonly consumed. The large human population and very high rate of

urbanization, improved income in some segments of the society, are also among the major driving forces that dramatically increase the demand for milk and milk products (Azage et al. 2013; Asrat et al., 2013).

Conclusion and Recommendations

Study on challenges and opportunities in Chench and kucha districts were conducted with an aim to understand the status and identify constraints hindering development of dairy sector in these areas. It could be concluded from the study that dairy production is at its infant stage and on contrary there is a high demand for dairy and dairy products in all the surveyed areas.

In general, the dairy production system in Chench and kucha areas is among the vast potential livestock production systems, with high opportunities for economic development. Nevertheless, different challenges are constraining the development of the system, these includes inadequate feeding both in quality and quantity, disease and parasites, poor management of dairy animals (housing , feeding, reproductive managements, lack and inefficiency of AI services, absence of breeding and production records, unavailability of improved genotypes and poor genetic make-up of indigenous animals which actually reflected in low milk production and dairy products marketing are mentioned worth.

- Feed is low both in quality and quantity hence strong extension work on use of concentrate feed, grazing land management, and development of improved forage is important.
- Disease and parasite are among the major problems, hence livestock owners should be trained with hygienic procedures of milking and milk processing as well as equipments used to reduce the risk as 90% of the disease and parasite occurrence is due to poor hygiene.

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