

Dairy Input Service Delivery System By Lead Farm To Dairy Farmers For The Improvement Of Dairying In Three Zones Of Oromia, Ethiopia.

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ABSTRACT: The study was carried out to identify the types dairy input services delivered by various lead farms and assess the role of dairy input service delivery of the lead farms on the dairy farmers in three districts of Oromia region, Ethiopia. From Ada'a district Alfa Dairy farm, Cowgrow and Genesis farm, from Welmera district Holetta agricultural Research Center (HARC) and from Ambo district Gadisa Gobena commercial farm were selected for this study. A total of 196 respondents (98 respondents who received and 98 who did not receive dairy input services) were randomly selected with respect to five lead farms and from around lead farm interviewed individually by using semi structured questionnaires. The data collected were analyzed by using SPSS version 20. The results of the study indicate that the dairy input service provision was mainly carried out by private, public sector, lead farms and per diem worker (veterinarian personnel of different organization). Among these, private sector plays a leading role in providing animal feed, drug supply and milk marketing. The study results showed that public and a per diem worker plays a significant role in AI, vaccination and treatment service. In cross bred heifers/cows service 48.5 and 19.9 % were provided by smallholder dairy farmers and lead farms respectively. In general lead farm services consist of feed (7.7 %), crossbred heifers & cows (19.9 %), bull service (27.1 %) and milk marketing (19.9 %). However, there was no designed mechanism to coordinate dairy input service providers for effective delivery of service. It was observed that lack of adequate feed in quantities and quality, inappropriate breed, treatment, disease control and milk marketing were found to be the major constraint hindering dairy production and productivity in the study area. Even though the lead farms played roles in the improvement of dairy sector in general and dairy farmers who received service production performance in particular, their service did not improve significantly the dairy production performance in the study area. It could be suggested from the study that any type of dairy input service delivery should go along with provision of improved dairy heifers/cows because either feed, health or market service alone did not result in any change in the performance of dairy cows. Moreover the dairy input service delivery system by lead farm should be demand driven and participatory to create trust and accelerate the transformation of dairy farmers.

Keywords: dairy, input service delivery, access to markets, lead farms

Introduction

Globally, the livestock sector accounts for 40 percent of agricultural gross domestic product (GDP), employs 1.3 billion people and creates livelihoods for one billion of the world's poor (FAO 2006). Dairy production plays vital roles in generating income to farmers, creating job opportunities, ensuring food security, providing services, contributing to asset, social, cultural and environmental values, and sustains livelihoods. Ethiopia is a home for about 57.83 million cattle. From the total cattle population 98.59% are local breeds, while the hybrids and pure exotic breeds represent 1.22 and 0.19%, respectively (CSA 2016). The dairy sector in Ethiopia holds large potential to contribute to the commercialization of the agriculture sector due to the country's large livestock population, the favorable climate for improved and high-yielding dairy breeds, and high potential for animal feed production (Ahmed et al 2004). However, the sector contributes to only half of the livestock output and about 30% of employment (Tesfaye et al 2008). Despite high dairy cattle population and favorable environmental conditions exist; the current milk output per capita is very low. Constraints to the development of livestock sector in general and dairy in particular are associated with a number of complex and inter-related factors such as inadequate feed and nutrition, widespread diseases, poor genetic potential of local breeds, market problem, inefficiency of livestock development services with

respect to credit, extension, marketing and infrastructure (Negassa et al 2011). In order to alleviate the constraints and realize the potential of the dairy sector, decades of efforts have been made to improve provision of dairy input and support services delivery, but these did not bring the expected output. This study was intended to fill the information gap in dairy input services delivery by lead farm to dairy farmers in three zones of Oromia National Regional State, especially around Finfinne. Thus, the objectives the study were to identifying the types of dairy input services delivered by various lead farm and others sources of dairy input service to dairy farmers and to assess the role of dairy input service delivery of the lead farms on the dairy farmers in the study area.

MATERIALS AND METHODS

Description of the study areas: The study was conducted in West Showa, Oromia special Zone surrounding Finfine and East Showa zone of Oromia regional state. The altitudes of these areas range from 1100 to 2600 M.a.s.l. and have highland and semi-arid types of climate. The rainfall is bimodal with the short rains from February to May and long rains from June to September. The predominant production system in these areas is urban, peri-urban and mixed crop-livestock farming. Cattle are the most important livestock species in

the areas. These three districts were purposively selected based on the presence of lead farm that deliver dairy input services to dairy farmers. Within each district, all the available lead farms were included: Alfa Dairy Farm, Cowgrow and Genesis farm from Ada'a district, Holetta Agricultural Research Center from Welmera district, and Gadisa Gobena commercial farm from Ambo district.

SAMPLING TECHNIQUE: Three districts were purposively selected from the three zone based on the presence of the lead farms. About 15-28 dairy farmers who received services from the lead farm and an equal number of dairy farmers who did not receive services from the lead farms were randomly selected around the lead farms, proportionally sampled and giving a total of 196 households for the study. The sample size was determined by using Yemane formula (Yemane 1967). The study used the following formula to calculate sample size.

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

Total population (N) = 5000
e = 7%

Therefore;

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

$$n = \frac{5000}{1 + 5000(0.07)^2}$$

n=196

Therefore total sample size of 196 dairy farmers was used for the study. Proportional sampling techniques was employed to determine the number of households that participate in each site (lead farm).

Methods of data collection: Both primary and secondary data were used for the study. Primary data were collected from dairy farmers and lead farms by using semi-structured questionnaires. All the data collected through interviews was supported by focal group discussions and key informant interviews.

Data analysis: Quantitative data collected were analyzed with Statistical Package for Social Science (SPSS Version 20). The results of the analyzed data were summarized with the help of tables. Differences were considered statistically significant if the p-value is less than the alpha level of 0.05 (P<0.05).

The mechanism used by lead farm in delivering services: The term lead farm in Ethiopian context refer to relatively large farms that are established and managed by government agencies, Ethiopian or foreign farmers. These large farms tend to serve as a supportive platform for the neighbouring smallholder farmers and all large farms are not a lead farm that means to be a lead farm there must be a link between the lead farm and the surrounding communities in the form of coordination as platform support. Lead farmers are mainly financially independent of dairy farmers and have access to markets not reachable for smallholder's dairy farmers (Chabata and Wolf, 2013). The lead farm uses different mechanism to interact with dairy farmers in line with its objectives i.e. contract farming, milk collection point, milk marketing, extension service feed supply, cross breeding and veterinary services.

Table 1: Sources of dairy input services in the study areas

Variables	Frequency	Percent
1 Source of cross breed cows/heifers		
Lead farm	39	19.9
ARC(Agricultural Research Center)	7	3.6
Smallholder farmers	95	48.5
Family	5	2.6
Breed at home	6	3.1
NGO'S	5	2.6
2 Source of AI		
Public	58	29.6
Perdiem	56	28.6
Cooperatives	7	3.6
Private	16	8.2
No AI service users	59	30.1
3 Source of bull service		
Lead farm	16	27
Own bull	4	6.8
Local bull	39	66.3
4 Source of feed service		
Lead farm	15	7.7
Private feed suppliers	105	52.6
Natural pasture and crop residues	39	19.9
Private and its own	39	19.9

RESULTS AND DISCUSSION

Source of dairy input service delivery: Respondents are engaged in different occupations for income generating such as civil servant, crop production, retirement and full time dairy farmers (Table1). Out of the total respondents in the study area 30.1 % of the household reported dairy production as their major source of income, 26.5 % of the respondent reported both dairy and crop production as their major income, 19.9 % of the respondents dairy production, salary and pension reported as the major income, and 17.9 % crop production as the main major income for the household. The study reveals that the majority of the respondents use dairy production as a major source of income of the households in urban and peri-urban area, and as a side business in the rural area of the study area. The current finding is similar to the finding of Gebrekidan et al (2012) who reported that dairy production, crop production, house rent and salary were the main source of income of households in their order of importance in the central zone of Tigray.

Source of Household Income Respondents are engaged in different occupations for income generating such as civil servant, crop production, retirement and full time dairy farmers (Table1). Out of the total respondents in the study area 30.1 % of the household reported dairy production as their major source of income, 26.5 % of the respondent reported both dairy and crop production as their major income, 19.9 % of the respondents dairy production, salary and pension reported as the major income, and 17.9 % crop production as the main major income for the household. The study reveals that the majority of the respondents use dairy production as a major source of income of the households in urban and peri-urban area, and as a side business in the rural area of the study area. The current finding is similar to the finding

of Gebrekidan et al (2012) who reported that dairy production, crop production, house rent and salary were the main source of income of households in their order of importance in the central zone of Tigray

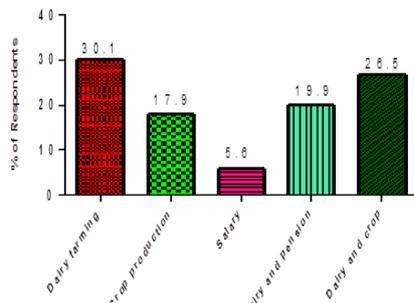


Figure 6. The Main income sources

The present result clearly indicates the significant importance of dairying as a source of income in supporting livelihoods of rural, urban and peri-urban households in the study areas.

Categories of dairy input service delivery: Dairy input service deliveries in the study area were categorized mainly into production, health and marketing services. The major sources of each service are private, public, lead farm and per diem.

Source of production service delivery: Dairy production service delivery in the study area includes cross breeding, feed and financial services delivery. Cross breeding service deliver includes: artificial insemination (AI) distribution of improved cross bred and natural mating.

Source of cross bred heifers/ cows: Table 1 presents the different sources of crossbred cows in the study areas. The overall sources of cross bred heifers/ cows in the study areas were lead farms, Agricultural Research Center (ARC), NGOs, crossing their own local bred, purchased from small holders and inherited from parents. The majority of the respondents (48.5%) in the study area reported that they got crossbred cows/ heifers through purchase from smallholders dairy farmers, 19.9% got their cross bred dairy cows from lead farm. This study clearly showed that the significant contribution of lead farms in supplying improved bred heifers/cows to the neighboring dairy farms, though the purchase from dairy farmers is still the main source of cross breed heifers and cows. It is learnt from the study that cross breed heifer/s/cows distribution should be one of the prominent services among the production service delivery by lead farms and other service providers, This is because no one is responsible and deliver the service of distributing cross breed heifers/cows to smallholder's dairy farmers except two lead farms i.e. HARC and Cowgrow in the study areas, but this could not conform the ever increasing demand for cross breed heifers and the price of cross breed heifers is also increasing vertically without limits beyond the reachable capacities of dairy farmers.

Sources of labor for dairy activities: - Out of the total respondents 36.84 and 46.3 % were used only family and hired labour respectively for dairy production and dairy related activities. Whereas only 17.86 % of the

interviewed farmers reported to uses both hired and family labour for dairy production and dairy related activities.

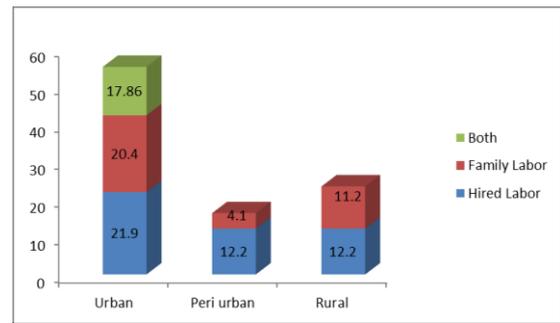


Figure:2 labour usage in different dairy production system

This result clearly indicated the significant contribution of family labor in dairy production and related activities i.e. for feeding dairy cow, cleaning barn and hand milking. The results obtained in the current study are in close conformity with the findings of Girma and Macro (2014) who reported that 67 % and 33 % of dairy producers used family and hired labour respectively, in Ada'a district west shoa zone the Oromia regional state. Out of the total interviewed dairy farmers 20.4%, 12.24 % and 12.24 % of respondents in urban, peri urban and rural areas reported to use only family labour, respectively to carry out their dairy production activities

Breeding service delivery: The breeding methods used in the study area are presented in Table 1. Both AI and natural mating were used as breeding methods in the study areas. The majority of the respondents (69.9%) in study area regularly use AI for their dairy herd and significant proportion of the household (30.1%) also reported to use natural mating. In contrary Ulfina et al (2013) reported that the majority of dairy farmers use natural service in peri-urban dairy production system, west Oromia, whereas only 25% from Jimma, 13% from Naqamte and 6% from Mattu reported to use AI and the majority dairy farmer use natural service. These differences are due to easy access to AI, long time experience in using AI and awareness created in different types of training. It was observed that there were many AI service providers in the study areas. The sources of AI for dairy farmers in the study areas were public, per diem, dairy cooperatives and private inseminators. Out of the total respondents 29.6 % uses public, 28.6 % uses per diem as source of AI. This study result indicates the significant contribution of public sectors and per diem workers of different organization in AI service deliveries to dairy farmers. It was reported that the reason for increased percentage of per diem AI service was due to inconvenience to take the dairy cows to public service station and lack of service during week end in public service stations. Natural mating using improved bull was one method of breed improvement. Though improved bull service gives relief to the farmers, where it is inconvenient to use AI, several factors like lack of information on the genotype of the bull, bull shortage, non-replacement of exotic bulls and possibility of disease transmission where some of the bottlenecks in the area. Those who did not use AI and improved bull service were who lack awareness and experience of either. They also

claimed that the lead farms are not offering the service as expected, they are rather business oriented.

Table 2: Sources of health service in the study areas

Variable	Frequency	Percent
1 Source of treatments		
Public	27	13.8
Public and private	58	29.6
Public and Perdiem	35	17.9
Lead farm, Public and Predium	16	8.2
Private and Perdiem	60	30.6
2 Source of vaccination		
Public	107	54.6
Public and perdiem	89	45.4
3 Source of drug supply		
Private	80	40.8
Public	38	19.4
Private and public	62	31.6
Lead farm, private and public	16	8.2

Dairy cow feed service delivery: The source of dairy feed in the study area is presented in Table 1. Result revealed that the majority (52.6%) of the respondents in the study area reported private feed suppliers as a source of feed for dairy cows. Only 7.7 % reported that the lead farm offers them feed. The remaining proportion reported to using their own farm (only grazing and crop residues) and private. This study clearly shows that significant contribution of private service providers in dairy feed supply.

Health service delivery: the major veterinary service delivery system in the study area includes treatment, vaccination and drug supply (Table 2). Currently there were four major veterinary service providers in the study area. These are public, private, perdiem and lead farms. Vaccination service was given by only two health service providers, public service which accounts about (54.6%) and perdiem service providers which account (45.5 %). Public veterinary service is a government institute a place where animals are treated and vaccinated against infectious diseases.

Table 3: Sources and types of market service in the study areas

1.	Source of milk market	Frequency	%
	Formal	102	52.04
	Informal	40	20.41
	Both	15	7.7
	No milk market	39	19.9
2 Source of formal milk market			
	Lead farm	54	27.55
	Private	38	19.39
	Cooperatives	10	5.10
3 Source of informal milk market			
	Cafeterias'	15	7.65
	Neighboring	12	6.12
	Both	7	3.57

Treatments service delivery was provided by all health service providers, public which accounts about (29.6%), private accounts (17.9%), public and perdiem accounts (13.8%) and private & perdiem accounts (30.6 %). The drug service delivery was dominated by three drug providers, private (40.8%), public (19.4%) and private & public (31.6%) Table2. The present result is in agreement with the finding of Anteneh (2008) who reported that public, NGO's and private sector play a vital role in provision of different animal health inputs. From this study it was learnt that smallholder dairy farmers uses different option for health service. It is also reported that the health services provided by perdiem and private were delivery at home on call basis with very high cost of service. The reason for increased percentage of private and perdiem service from worker of different organization in providing vaccination, treatment and drug supply were reported due to inconvenience to take the dairy cows to public service station and problems related to lack of service at week end and time bund of public service respectively. Generally it was noticed that the contribution of lead farm in health service is insignificant as compared to public and private.

Market service delivery: It was observed that facilitating linkages with milk market was one of the major services delivered to dairy farmers in the study areas. It was reported that three major activities were conducted under market service: milk collection, processing and marketing. The milk was collected twice a day, in the morning and evening. Among five lead farms only two lead farms i.e. Cowgrow and Genesis farms offered the market service to dairy farmers. Dairy farmers in the study area were able to market their milk to formal and informal market with different actors in their surrounding which include lead farms, cooperatives, neighbors' consumers, private milk processors and cafe. In the study areas, out of the total respondents 80.1% market their milk through formal or informal market and 19.9% did not sell their milk they might use for traditional processing to produce butter and others dairy products for home consumption. This result was in contrary to Lemma (2004) who reported that 96.7 % of the respondents in Adami Tulu and Arsi Negelle, and 93.3% in Lume districts did not sell fresh milk; this difference could be related to difference in market accesses. Of the total respondents who sell their milk to formal market 27.55, 19.39 and 5.10 % sell their milk to private milk processors, lead farms and cooperatives, respectively. This result clearly showed the significant contribution of lead farms to formal milk marketing service to the neighboring smallholder's dairy farmers, though private milk processor was still the main the source of formal milk market in the study area. This finding has similarity with the finding of Girma and Marco (2014), who reported that most of the dairy farmers had preferred to sell their milk through informal chain in search of high price per liter of milk at Ada'a district east shoa zone, Oromia. Of the total respondent, 52.04 % selling their milk to formal market 45.9% and 6.12% were found in Ada'a and Welmera districts, respectively. There was no formal milk marketing in and around Ambo town, all milk produced in and around Ambo district was supplied to informal market, all milk produced from lead farm, Ambo University and other dairy farmers were

supplied to informal market, and the milk price was very high as compared to other district, this attributed to low supply of milk and high demand.

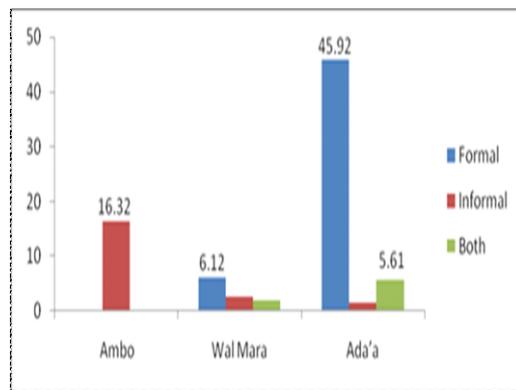


Figure 3: Types of milk marketing in the study area

Lactation performance of dairy cows under Alfa Dairy Farm, Genesis and Gadisa Gobena

The overall (mean \pm SE) milk yield/hh, milk yield/cow and LL of dairy cow is presented in Table 4. The average milk yield/cow and LL of dairy cow under Alfa Dairy Farm, Genesis and Gadisa Gobena who received and who

did not receive services were statistically not significant ($P>0.05$). This might be due to the fact that there was no difference in bred, feed supply and management practices, as the other group of farmers could also access the feed from other sources. These two groups of farmers also had similar milk market accesses to sell their milk. The study result indicated that service from lead farm did not bring any significant change on lactation performance of dairy cows.

Reproductive performance of dairy cow under Alfa Dairy Farms, Genesis and Gaddisa Gobena farm

The overall (mean \pm SE) AFS, AFC and CI of dairy cow is presented in Table 4. The mean of AFS, AFC and CI of dairy cow under Alfa Dairy Farm, Genesis and Gaddisa Gobena who received and who did not receive services were statistically not significantly different ($P>0.05$). This might be because of the fact that there was no difference in feed supply and management practices as the other group of farmers can also accessed the feed from other sources. The two groups of farmers also had similar milk market accesses to sell their milk. The study results indicate that service from lead farms did not bring any significant change on reproductive performance of dairy cows.

Table 4 Mean \pm SE of AFS, AFC, CI, LL Milk/h hh, Milk/cow of Dairy cows who received and who did not receive services from Alfa, cow grow and Genesis farm

Variables	Alfa Farm			Gaddisa Gobena=32			Genesis farm		
	DFRS=15	DFNRS=15	p-value	DFRS=16	DFNRS=16	P-value	DFRS=23	DFNRS=23	P-value
Milk yield hh/day lit	47.80 \pm 5.59	47.33 \pm 3.70	0.945	29.44 \pm 4.2	29.63 \pm 4.46	0.976	43.79 \pm 5.22	37.61 \pm 4.22	0.361
Milk /cow lit	12.6 \pm 0.414	12.53 \pm 0.52	0.928	11.44 \pm 0.44	11.06 \pm 0.57	0.604	11.14 \pm 0.407	10.96 \pm 0.38	0.701
AFS month	17.40 \pm 0.27	17.67 \pm 0.16	0.450	18.81 \pm 0.63	19 \pm 0.61	0.832	18.04 \pm 0.131	17.93 \pm 0.13	0.557
AFC month	26.67 \pm 0.32	26.80 \pm 0.15	0.707	27.69 \pm 0.21	27.69 \pm 0.21	1	27.11 \pm 0.15	27 \pm 0.15	0.608
CI month	13.40 \pm 0.21	13.53 \pm 0.17	0.626	13.5 \pm 0.12	13.44 \pm 0.13	0.733	14.5 \pm 0.096	14.46 \pm 0.10	0.794
LL day	276.07 \pm 1.3	275.47 \pm 0.55	0.671	275.06 \pm 1.15	275.63 \pm 1.12	0.729	275.82 \pm 0.88	276.04 \pm 0.9	0.866

DFRS - Dairy farmers who received services from a lead farm

DFNRS- Dairy farmers who did not receive services from a lead farm

Lactation performance of dairy Cow under HARC and Cowgrow

The overall (mean and SE) the milk yield/hh/day, milk yield/cow and LL of dairy cow is present in Table 5. The average milk/hh, milk/cow and LL of dairy Cow under Cowgrow and HARC who received and who did not receive services were significantly different ($P<0.05$). This difference in lactation performance between two groups of dairy cows also makes difference on milk produced per day per households hereby on the income of hh. Dairy farmers who received and who did not receive cross breed heifer from Cowgrow produce on average 11.48 and 3.38 liter of milk /hh/day and the average incomes from milk sales were 35,828 and 9,742 per year respectively. Under HARC, dairy farmers who received and who did not receive cross breed heifers produce on average 11.48 and 4.11 liter of milk /hh/day and the average income from milk sales were 35,520 and 11,061

per year respectively. The average income was significantly different ($P<0.05$) between the two groups of dairy farmers under the Cowgrow and HARC. This might be due to differences in breed and feeding management, who received service, had F1 cross bred dairy cows which yield average 9.94 lit of milk/cow/day. This study clearly indicates that the input service delivery system which can significantly influence the livelihood dairy farmers will be in terms provision cross breed.

Reproductive performance of dairy cow under Cowgrow and HARC:

The overall (mean \pm SE) of AFS, AFC and CI of dairy cow is presented in Table 5. The mean AFS, AFC and CI of dairy Cow under Cowgrow and HARC who received and who did not receive service were statistically significant different ($P<0.05$). This variation was attributed to difference in breed and management systems.

Table: 5 mean \pm SE of AFS, AFC, CI, and LL Milk/hh, Milk/cow of Dairy cows who received and who did not receives service e from HARC and Cowgrow farm

Variable	Holetta Agricultural research center=46			Cow grow N =32		
	DFRS=23	DFNRS=23	P-value	DFRS=16	DFNRS=16	P-value
Milk yield hh/day/lit	11.48 \pm 0.68	5.11 \pm 0.54	0.01	12.44 \pm 1.14	3.38 \pm 0.32	0.01
Milk /cow lit	9.82 \pm 0.61	2.17 \pm 0.59	0.02	9.94 \pm 1.6	1.934 \pm 0.392	0.02
AFS month	18.09 \pm 0.15	37.96 \pm 0.31	0.01	20 \pm 0.18	38.06 \pm 0.281	0.03
AFC month	27.43 \pm 0.15	46.91 \pm 0.31	0.02	29 \pm 0.18	45.82 \pm 1.29	0.02
CI Month	14.13 \pm 0.13	22.83 \pm 0.17	0.01	14.06 \pm 0.21	21.75 \pm 0.57	0.01
LL day	277.5 \pm 0.63	389.96 \pm 0.2	0.03	275.31 \pm 0.97	297.38 \pm 4.31	0.02
Income milk sale	35520.43 \pm 23	1062.5 \pm 5	0.02	35828.88 \pm 32	9742.94 \pm 1.32	0.02

Constraints of dairy input service delivery: Dairy production in the study area was constrained by many factors, among the others inputs supply both in quantity and quality, health and market.

Dairy production service delivery constraints: Major determinants of production service in the study areas are presented in Table 6. Among others inadequate animal feed, lack of appropriate breed, shortage of land and inadequate extension are worth mentioned in order of importance.

Constraints of feeds: Inadequate supply and cost of feed was observed as one of the major factors limiting dairy productivity in rural and urban study areas respectively. Out of the total household 88.2%, 89.13%, and 93.75 % of the respondents in Ada'a, Welmera and Ambo district respectively reported feed as the first determinant which affects the dairy productivity in the study area Table 6. The current finding agrees with the findings of Solomon et al (2014) and Girma and Macro (2014) who reported that feed severe shortage and high cost as a major constraint in Metekel zone, in Ethiopia and Ada'a district, East shoa Oromia, respectively. They also reported that cross breed dairy cows need higher nutrient demand as compared to the local cows due to their large body size and higher production which aggravated the feed shortage in commercial dairy farm. Among the production constraints feed was the major one which impede the development of dairy production in Ethiopia in general and the study area in particular. Availability, quality and quantity of feed vary among varies production systems. The availability and quality of feed resources and efficient nutritional management was the principal Constraint related to feeds and feeding.

Genetic constraints: A major determinant of production service in the study areas is presented in Table 6. About 89%, 93.47%, and 93.75% of the respondents in Ada'a, Welmera and Ambo district respectively, reported genetic constraint as the 2nd determinant which affects the dairy productivity in peri-urban and rural areas of the study areas.

Shortage of Land: Shortage of land was also reported as one of the constraints of dairy farming in study areas. The survey result revealed that about 95.8, 84.78 and 90.63% of the respondents in Ada'a, Welmera and Ambo district respectively reported shortage of land as the 3rd constraint which hinders the development of dairy production in the study areas.

Health service constraint: Major determinants of veterinary service in the study areas are presented in Table 6. Among others disease outbreak, lack of appropriate treatment, high price and inadequate supply of drug, lack of veterinary service inadequate extension and distance of service providers are worth mentioned in order of importance. It was observed that the public and private health service provider were constrained by time, place of service and high cost of service respectively. Of the total household about 98.8, 91.3 and 90.6 % of the respondents in Ada'a, Welmera and Ambo district respectively reported that disease outbreak was the first determinant which affects the dairy productivity in the study areas. Lack of appropriate treatment and drug supply were reported as the 2nd and 3rd determinant which affect the dairy productivity in all production system of the study area, respectively.

Table 6: Constraints of dairy input services deliver in the study areas

Constraints	Ranking of constraints in production service									Overall
	Ada'a			Welmera			Ambo			
	1 st	2 nd	3 rd	1 st	2 nd	3 rd	1 st	2 nd	3 rd	
Inadequate animal feed	105	13	-	41	5	-	30	2	-	1 st
Lack of appropriate breed	6	105	7	-	43	3	-	2	30	2 nd
Shortage of land	3	2	113	-	7	39	-	3	29	3 rd
	Ranking of constraints in veterinary service									Overall
	Ada'a			Welmera			Ambo			
	1 st	2 nd	3 rd	1 st	2 nd	3 rd	1 st	2 nd	3 rd	
Disease out break	106	12	-	42	4	2	29	3	-	1 st
Lack of appropriate treatment	7	108	3	-	40	6	2	30	-	2 nd
Lack appropriate vaccination	-	6	112	-	4	42	-	5	27	3 rd
Ranking of constraints in marketing service										

	Ada'a			Welmera			Ambo			
	1 st	2 nd	3 rd	1 st	2 nd	3 rd	1 st	2 nd	3 rd	
Low milk price	109	9	-	42	4	-	29	3	-	1 st
Lack of regular milk market	-	107	11	-	40	6	-	28	4	2 nd
Seasonal milk price fluctuation	-	6	112	-	4	42	-	2	30	3 rd

Marketing service constraints: The major determinants of milk marketing services in the study areas are presented in Table 6. Among others, low milk price, lack of regular milk market, seasonal milk price fluctuations and lack of price setting are worth mentioned in order of importance. Out of the total household respondents 91.6%, 91.3% and 90.6% in Ada'a, Welmera and Ambo respectively, reported that low milk price was the first determinant for milk marketing because it did not commensurate with every increase with price of concentrates feed for dairy cows. Lack of regular milk marketing and seasonal milk price fluctuation were reported as 2nd and 3rd determinants which affect milk marketing hence profitability of dairy farmers and dairy productivity in general at the study area. This results are in line with the findings of Ulfina et al (2013) who reported that the major marketing constraints were fluctuation in demand and supply of dairy products as a result of feed shortage and different socio-cultural reasons, poor infrastructure such as lack of cooling facilities, simple processing equipment's and quality testing skills and equipment's and the long-time fasting of the members of the Ethiopian Orthodox.

Conclusion. It is concluded that the contribution of lead farm was not significant except Cowgrow and Holetta agricultural research center. Even though the lead farms played roles in the improvement of dairy sector in general and dairy farmers who receive service production performance in particular, their service did not improve significantly the dairy production performance. On top this, the dairy farmers also claimed that they are business oriented and not meant for the improvement of the livelihood of the dairy farmers.

Recommendations From the results of the study it can be revealed that any single service alone production, health or milk marketing service provided by lead farm or others dairy input service did not bring any significant change on performance of dairy farmers in the study areas. Thus, the following recommendations should be considered to divert the existing situation and improve dairy input service deliver in the study areas. It could be suggested from the study that any type of dairy input service delivery should go along with provision of improved dairy heifers/cows because either feed, health or market service alone did not result in any improvement in the performance of dairy cows. It is also recommended that the lead farm should clearly define the service they deliver, after these conditions that the farmers need to full fill in order to benefit from the services and the benefit the farmer could get from them. There should be strong coordination among the dairy input service delivery actors and the lead farm service delivery system should focus on existing gap in dairy input service delivery. The general dairy input service delivery system by lead farm should be demand driven and participatory to make trust and accelerate the transformation of dairy sector by providing satisfactory and reliable service to the farmer.

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