Assessment of Beef Cattle Production and Marketing Practice in Eastern Oromia, Ethiopia

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Abstract
A cross sectional study was conducted with the objectives to assessing beef cattle production and trading system in eastern Oromia. Structured questionnaire and a onetime observation were conducted on 50 producers and 40 traders a total of 90 beef cattle producers and traders, which were, include purposively in the study using random sampling techniques to generate set data. Based on the result of survey made the producers kept cattle for multiple purposes, on average age of 6-9 years. Most farmers sold animals in near by village market. Major constraints for producers were feed shortage, animal health and lack of improve breeds. Traders transported mixed cattle in irrespective of ages, breeds, and sex to their destination which was on average 118.5±19 km via vehicle. Harar breed had high demand in local market while Boran was used for export purpose. The perception of traders on factors affecting the quality of beef indicated that beating, feed shortage, and agroecology were important being ranked 1st, 2nd and 3rd respectively. From this study, it was concluded that quality of beef produced in study areas was relatively older. Resulted tough beef source. It is recommended that strategy should be developed to encourage premium payment for young cattle marketing that is not exposed to draft service and develop strategy to breed improvement to overcome stock decreases.
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INTRODUCTION

Ethiopia owns immense untapped livestock resources scattered over diverse agroecology. Environmental conditions of the country made conducive to the diversity of livestock production. The total cattle population of the country estimated about 57.83 million, 28. 89 million sheep, 29.70 million goat, 60.51 million poultry, 2.08 million horses, 7.88 million donkeys, 1.23 million camels and 0.41 million mules (CSA, 2016/17). Even though the country is blessed with huge livestock resources, the share of meat and other slaughter by-products were underutilized compared to its potential (Eyob and Zewudu, 2016).

Cattle are kept mainly for draft power, milk and manure production and are usually only sold when they are too old for these purposes, or drought or cash shortages force people to sell (Matawork, 2017). This happened in Ethiopia due to knowledge gap, limited promotion done in marketing; limited intra-Africa trade integration; poor linkage among stakeholders; few market outlets and other interlinked problems (EMDIDI, 2016). Commonly there are three different type of beef cattle production system in Ethiopia. Those are traditional methods, Hararghe fattening and by product based production system. Each of the production systems had their own characteristics and had positive and negative impacts.

The main beef cattle channel actor were producers, traders, cooperatives, abattoirs, butchers, processors, and consumers (Kefyalew, 2011). However, in Ethiopia there is less business communication and linkage between livestock chain actors (Tekeba, 2016). The actors mostly act individually as their benefit. Live animals are marketed through traditional marketing routes developed over years, which were based on visual assumption on body conformation animal. This happened due to the terminal market have not accessibility of weight which result lengthened value chain of animal marketing. In other wise in Ethiopia, recent studies estimated that annual illegal flow of livestock through boundaries reaches high than formal one.The actual performance has remained very low, leaving most of the projected livestock off take for the unofficial cross-border export and the domestic market (Fekadu *et al*, 2017).

Marketing chains need institutional arrangements, public investment and enabling policies and regulations (EMDIDI, 2016). Marketing dairy calf as beef cattle was rare which otherwise contribute to cattle supply in beef market (Mummed and Webb, 2014). Understanding producers and other stakeholder behavior on dairy beef is vitally important. Cross sectional study was conducted from October, 2017 to January, 2017. After interviewing traders at two big livestock terminal market namely Adama and Dire Dawa and information was indentified about the original source of cattle to terminal market.   Then fattening farms and one time visit of other extensive producers was made and the required information was collected by structured questioner and direct observation. The study was conducted with the objective to assess beef cattle production and trading practice, production and marketing constraint, breed and age preference for marketing and perception for beef quality determinants in Eastern Oromia.

MATERIALS AND METHODS

Description of the Study Area

Adama town towns is situated at 92 km East of Adiis Ababa on the highway from Addis Ababa to Harar. The towns have good infrastructures that facilitates and link marketing in the national and international. The annual average minimum and maximum temperature of Adama town is 18 and 32, respectively. The specific geographical location of the Adama town is on the geographic coordinates of: 8° 33' 00"N and 39° 16' 00"E. The altitude of the city is 1627m above sea level (Arse *et al.,* 2013).

Dire Dawa town is located 520 km to Eastern Addis Ababa Capital city of Ethiopia on the halfway point between the Djibouti - Addis Ababa railway line. The average temperature 22.5 C°, the altitude of the towns is 1200m above sea level and average annual rain fall was 626 mm. The specific geographical location is 9°35′35"N and 41°51′58"E. The town is being one of the busiest business cities of the country among the valuable area of the Eastern Oromia zone. The town is serves as a good holiday destination for visitors from Djibouti and the Middle East. Having an international airport serves as an important gate way to the Hararge areas marking an important tourist destination center in the country.

Qullubi town is located in Meta district, Eastern Hararghe zone, Oromia National Regional state, Ethiopia. The specific geographical location of the *Qullubi* is on the geographic coordinates of; 9°35′35"N and 41°51′58"E. From the district of Eastern Hararghe, cattle from *Qullubi* town areas are well famous at Dire Dawa and Harar terminal market. The town is located 464 km form Addis Ababa capital cities of Ethiopian and 62 km from Harar town. The town is a popular pilgrimage site of the Ethiopia Coptic Orthodox Church, eventful religious festivals are held twice a year at this town on July 26 and December 28, which tens and thousands of pilgrims from all over the country attend.

Bale Robe is located in the Bale Zone of the South–Eastern Oromia National Regional state, Ethiopia. This town has is situated at latitude and longitude of 7°7′N; 40°0′E with an elevation of 2,492 meters (8,176 ft) above sea level. It is located about 430 kilometers from Ethiopia's capital Addis Ababa. Bale Robe has Airport facilities with neighboring Goba towns. The town is proximity for notable tourist attractions include the Sof Omar Caves, Bale Plateaus and Dinsho park were different indigenous animal and plants species situated.

Sagure town is the administrative center Dagalu and Tejo district, Arsi zone, Oromia National Regional state, Ethiopia. The altitude of this district ranges from 2500 to 3560 meters above sea level. This town has a latitude and longitude of 07° 45′N; 39°09′E with elevation of 2568 meters above sea level. It is located about 10km from zonal town of Asella and 185 km by road from Ethiopia's capital Addis Ababa.

Sampling procedures and survey data collection methods

The survey data were collected between the mid of September to the beginning of December 2017. Both qualitative and quantitative data were collected to evaluate production and marketing system of beef cattle in Eastern part of Oromia. Totally 90 individual respondent were interviewed using structured questionnaires. The questionnaires were prepared to generate data on perception of cattle producers (50) and traders (40) at different location. Purposive sampling techniques were used to select the respondents. The questionnaires were prepared differently for producers and traders. The traders were asked at Adama and Dire Dawa terminal market during they sold their animal for butchers, consumers and large traders/ exporters. After information was collected about, potential cattle source to respective terminal market from traders the cattle producers were also interviewed at in-situ of their production areas. The producers were interviewed from intensive dairy farm and feed lot in Adama and Dire Dawa towns, additional data were collected from Qullubi (Meta district) area, Bale Robe (Sinana district), Sagure (Digalu and Tijo district). Adama and Dire Dawa towns are big cattle terminal market in Eastern Oromia, Ethiopia.

Methods of survey data analysis

Descriptive statistics, Garret ranking techniques, Likert rating scale, and Chi-square were used to analyze collected quantitative data through using the Statistical Package for Social Science software (SPSS) version 20. The qualitative data was analyzed through description, explanation, and narration.

Descriptive statistics, such as percentage, mean and standard deviation were used to explain the different sociodemographic characteristics and other data collected by interview from respondents. Garret's ranking technique was employed to rank major constraints of beef cattle production, seasonal feed availability, beef quality determinants, preference for the breeds and ages. The percent position of each rank were calculated using the formula of Garrett (1969).

Percent position = 100 (Rij- 0.5)/Nj Where;

R_{ij}= Rank given for the ith items by the jth individual.

N_j= Number of items ranked by the jth individual**.**

By using the score card by Garret scores were allocated to the percentage values. Then for each factor, the scores of individual respondents were added together and divided by the total number of respondents for whom scores have been added. The mean scores for all the factors were ranked by arranging in descending order. Five

Likert (1932) rating scale was employed to analyze the perception of stakeholder on beef quality determinant. The Likert scale of 1 to 5 points was used to measure respondents' perception on beef quality determinants for positive items, strongly disagreed awarded 1 point, disagreed 2 points, neutral 3 points, agreed 4 points and strongly agreed 5 points. On the other hand, the reverse values were assigned for negative items. To create a Likert scale perception index five Likert items employed to develop a composite perception index and the items filled each respondent. Then the mean scores for all the factors ranked by arranging in descending order. The Likert scale of 1 to 5 points with a mean score of three (3) was used as a cut-off point to measure respondents' perception.

The mean score of three and above was used to denote agree while a mean score below three was used to denote disagree for positive items while the reverse decision was given on the contrary for the negative items. Chi-square test was used for one categorical dependent and two or more levels category of independent variables. It was employed to see if there were significant mean and proportion differences between categories in terms of different explanatory variables.

RESULTS AND DISCUSSION
Cattle producers
DEMOGRAPHIC CHARACTERISTICS OF CATTLE PRODUCERS AND TRADERS
Demographic characteristics of producers and traders in study areas are presented in Table 1. About 50 cattle produces were questioned. Out of the total respondents, about 82% were male while 18% were female. The current finding is similar with Yadenakachew (2016) who reported male respondents were dominance on market-oriented beef cattle fattening in South Omo of Ethiopia. With regards to educational level, most of 97.5% of the interviewed producers were literate from 1 grade to degree/diploma, with predominantly primary school (55%) and only about (2.5%) were illiterate. Most of respondent were in active productive age groups with an average of 41.86 ± 13.76 years. This was good opportunity to transfer relevant technology to producers for exploit livestock resources in the study area. Similar to producers majority of interviewed, traders were male 97.5% and most of them were in productive age group minimum 21 years and maximum 68 years in average 36.68±10.24 years. They, have good working experience as cattle traders, which were on average about 10 years. The most of the respondents assume that, they are engaged in a profitable business and gave them good opportunity to know their surrounding as they travel for their business. Among the respondent traders, only 2.5% were illiterates the others 97.5% were literate.

Table 1. Demographic characteristics of producers and traders

Variable	Attribute	Producers (n=50)		Traders (n=40)	
		n	%	n	%
Sex	Male	41	82	39	97.5
	Female	9	18	1	2.5
Educational status	Illiterates	12	24	1	2.5
	Primary school	28	56	22	55
	High School	8	16	13	32.5
	Dip/degree	2	4	4	10
		Min	Max	Mean + SD	Min	Max	Mean +D
Age (yr)		20	78	41.86+13.73	21	68	36.68+10.24
TE(yr)		-	-	-	2	53	9.42 +9.69

n= Number of respondents, Dip= Diploma, Yr= Year, SD=Standard deviation, TE (yr) = trading experience

Purposes of cattle production
The purpose of keeping cattle in the study areas are presented in Table 2. The result of the survey indicated that the cattle were kept for multipurpose (54%) in the study area like; milk production, draft power, income generation and prestige. Moreover, it was observed that subsistent production system with single purpose like for milk production, or meat, or draft purpose were noted in study areas. Majority of the respondents keep cattle for draft power in Sagure, Bale Robe, and Kulubi area. Producers sold oxen when they got old after exempted from draught purpose. Similarly, cows were sold after culled from milk purpose the result was agreement with Yesihak and Edward (2015). Location wise producers from Adama and Dire Dawa used cattle for specific purpose of either milk or beef. The reason of keeping cattle for specific purpose might be due to practice of market-oriented production system. In addition to that cattle were kept for agricultural purpose, manure, as banking and saving insurance. Similarly, keeping cattle for the agricultural purpose, manure, as banking and saving insurance in the rural area of the high land were reported by Mummed and Webb (2015); EMDIDI (2016); Eyob and Zewudu (2016).

Table 2. The purpose of keeping cattle in the study areas

Purpose	Location					Total n(50)	χ^2
	Adama (10)	Sagure (10)	Robe (10)	Dire Dawa (7)	Kulubi (13)		
Multiple	3(30)	5(50)	8(80)	(0)	11 (84.6)	27 (54)	
Milk	3(30)	1(10)	0(0)	3(42.8)	1(7.7)	8(16)	48.66
Draft	0(0)	2(20)	2(20)	0(0)	1 (7.7)	5(10)	***
Meat	3(30)	0(0)	0(0)	2(28.6)	0(0)	5(10)	
Milk &meat	0(0)	1(10)	0(0)	2(28.6)	0(0)	3(6)	
Income	1(10)	1(10)	0(0)	0(0)	0(0)	2(4)	

Multiple= milk, meat, draft and income, n= number of the respondents, χ^2= Chi-square, (x) = number in bracket is percent.

Management of cattle by producers

Management of cattle in study areas are presented in Table 3. The result of the study showed that about 64% respondents provided multiple management (locally available feed resource by allocate grazing land/concentrate, river water/clean water, shade and take care of health) of their cattle. The common feed resource used for the animals in the study area was grazing pasture, pruning fodder tree, crop residues. Similar result were reported by Estefanos *et al* (2014) at West and East Hararghe zone of Oromia National Regional state of Ethiopia. However, feed resource availability were depends on season of crop production and availability natural pastureland.

Housing was practiced for calves to weaning age with subsistent farmers in the study areas. With intensive farming system in the study, areas housing were available for all age groups of cattle. In the study areas female cattle were kept for a longer periods according of the producers (60%) usually to the average of 6 to 9 years. Majority of respondent (56.5%) kept male cattle from one to two years. Within this one to two years, bulls were used for ploughing, then after replaced by other young stock, the former being marketed for beef purpose. However, if these male cattle were born on the farm, some producers kept them for a longer period as they used them for drought purpose after being mature enough. This scenario was a bit different in the intensive farms, where the majority (6.5%) of the producers responded that they keep male cattle only for about 6 months and culled them from the farm.

Table 3. Management of cattle in study areas

Variable (n=50)	n	%
Management provide for cattle		
Allocate grazing land and used crop residues for cattle	2	4
Provided feed and clean water, health care (conv.) and house (shade)	5	10
Fetches river water, health (traditional and conv.) and allocate grazing land	11	22
Provided multiple management**	32	64
Length of time female cattle (n=40) kept on farm		
< 1 years	6	15
2 – 6 years	8	20
6-9 years	24	60
>9 Year	2	5
Length of time male cattle (n=46) kept on farm		
< 6 month	3	6.52
Up to 2 year *	26	56.52
2-6 year	5	10.87
6-9 year	10	21.74
>9 year	2	4.38

n= Number of respondents, * = shows male cattle from market, Conv. Conventional, Multiple management** = Health care, feed, water provide

Feed availability

Feed availability in study areas are presented in Table 4. The result revealed that natural pasture, crop residues, household left over and industrial by-products were the major feed available throughout a year in the study area. The importance of feed resource ranking indicated that natural pasture, crop residues, household left over and industrial by-products were 1st, 2nd, 3rd and 4th during the wet season. In the dry season crop residues was ranked first and the most important followed by industrial by-product, house left over and natural pasture, respectively. Despite feed resources availability varied across seasons, natural pasture and crop residues were the most important feed source throughout the year in the study area. The current finding was in line with Adugna (2008)

and Diriba (2014) who reported native pastures and crop residues as main feed resource in mixed farming system. Depending on agro-ecology and crop production system, the different locations of studied had different types of crop residues. In Kulubi area, sorghum and maize crop residues was the most important animal feed resource. This finding was in line with Estefanos *et al*. (2014) who reported that crop residues (Sorghum and Maize) and natural pasture were the major feed resource for cattle in the West and East Hararghe high land.

Table 4. Feed availability in study areas

Season	Variable	Ranked value				n	Mean Score	Rank
		1st	2nd	3rd	4th			
Wet season feed	Natural pasture	40	1	5	3	49	66.88	1
	Crop residues	3	19	17	11	50	46.56	2
	Household left over	0	6	17	29	49	38.10	3
	Industrial by product	7	6	10	7	50	29.52	4
Dry season feed	Crop residues	40	10	0	0	50	69.6	1
	Industrial by product	9	34	6	1	50	57.04	2
	Household left over	1	4	26	18	50	38.54	3
	Natural pasture	0	2	16	30	48	33.88	4

n= Number of respondents

In Arsi and Bale zone, barley and wheat crop residues were the main feed used during the dry season. The result of the current study were in line with Solomon (2008), who reported that cereal crops residues usually from barley and wheat were the most important feed resources in dry season in Bale and Arsi zone.

Intensive farming system owners responded that they were almost entirely dependent on outside feed resources like industrial by-products (noug seed cake, cotton seed cake, bean bran and wheat bran), maize (grain and bran) and different crop residues (*Teff*, barley, maize, and sorghum). The result was supported by Genet *et al.* (2017), where they came to similar conclusion for commercial beef cattle fattening practiced in East Shoa Zone

Beef cattle marketing system
Cattle marketing system in the study areas are presented in Table 5. The result revealed that the majority of respondents (68%) responded that they rear cattle only for subsistence instead of profit making. Those respondents who kept the cattle for market-orientation were from Adama and Dire Dawa cities practicing intensive production system. Despite, intensive farm produced cattle for the market purpose; getting low price for cattle, unnecessary involvement of brokers in the local and export market, higher cost of feed, less preference for dairy beef were the major bottleneck to producers. Absence of weight based price determination on the market and rapid increasing cost of feeds were also reported contributed to the problems.

Majority of producers (64%) sold their animals when age exceeded 5 years. The rests sold animal without considering the age to satisfy immediate cash need and cover children school fee. The majority of respondents did not often fatten their animals before selling. However, some of the producers practiced fattening, for the export market. This finding was comparable with Arse (2013); most producers do not often fatten and received market information before selling their cattle.

The producers sold cattle at local market, which have an average distance of 1-10 km ranges traveling 15 minutes to 2:30 hrs away from their village. Farmers had insufficient information's on price of cattle at secondary and terminal markets. The few numbers of producer sold well fatten cattle to secondary, terminal and agents to exporter markets, based on information from personal visiting of markets, friends and mass media. Increasing access to market information is important as it enhances efficiency of marketing system for farmers.

About 46% of farmers sold cattle twice a year. This might be associated with biannual demanded for money, which might be need to purchasing of agricultural input before plantation of crops and to cover school expanse for children at start of year. This finding was similar to the report of Arse (2012) who reported producers sold their animals twice a year. The cattle-selling price in the past 5 to 10 years had increasing trend, which might be associated with inflation, increase in cost of inputs and other related expenses for cattle production. The farmers in the study areas sold cattle to satisfy immediate cash need, purchases of agricultural inputs and replace old cattle the body conditions of the cattle were not criteria for sale. These result in harmony with the concept that the majority of the cattle producers practiced a subsistent production system rather than market-oriented. Belete *et al*. (2010) reported comparable findings from the traditional cattle production system where emaciated oxen were sold after the ploughing season while they were in poor body conditions.

Table 5. Cattle marketing system

Variable	Attribute	N	%
Produce cattle for marketing	Yes	16	32
	No	34	68
Practice fattening before selling	Yes	11	22
	No	39	78
Collect market information	Yes	3	6
	No	47	94
Source of information	Mass- media	2	4
	personal visiting to market	39	78
	Friends	9	18
Selling frequency (per year)	1	15	30
	2	23	46
	3	11	22
	4	1	2
Trends of cattle price	Increase	49	98
	Decrease	1	2
Reason for selling cattle	Immediate cash needed	4	8
	input purchased	6	12
	Replaced with other cattle	20	40
	Multiple purpose	20	40

Constraints of beef cattle production
Constraints of beef cattle production in the study areas are presented in Table 6. Accordingly, Garret ranking technique ranked the constraints based on severity order. Feed shortage was a major constraint of cattle production ranked first followed by lack of an adequate veterinary service, improved breed, production technologies and fattening facilities (land and house), respectively. This might be due to decreases grazing land, lack of improved feed and frequently increased the cost of industrial by-product. Belay *et al*. (2012) and Genet *et al*. (2017) reported a similar result with the current finding on cattle production constraint. The concerned body should be established improved forage in different zones, creating awareness on feed resource available management and establishing a feed industry sub-marketing center in close to where most beef cattle sources to enhance the sustainable supply of beef cattle by alleviating the feed scarcity and enhance its quality to fully exploit the production.

Table 6. Constraints of beef cattle production

Variable	Rank value (n=50)								MS	Rank
	1st	2nd	3rd	4th	5th	6th	7th	8th		
Shortage of feed resource	36	8	4	2	0	0	0	0	75.4	1
Inadequate health service	2	4	1	8	8	2	4	1	57.08	2
Lack of improved breeds	2	2	6	10	6	4	9	1	54.28	3
Inadequate technologies	5	7	7	10	9	3	6	3	54.04	4
Lack of fattening place	1	6	6	5	8	8	5	1	48.1	5
Lack of credit service	2	4	6	6	7	7	7	1	47.04	6
Lack of market information	0	0	6	4	5	5	8	2	46.36	7
Shortage of water supply	2	0	3	6	7	8	4	10	43.42	8

n= Number of respondents, MS= mean score

Cattle traders
Sources of beef cattle and marketing system
Beef cattle source for Adama and Dire Dawa terminal marketing are presented in Table 7. The current survey result revealed that the source cattle supplied for Adama terminal market were from Adama intensive farm, and subsistent farmers from Arsi, Bale, West Hararghe and East Shoa zones. For Dire Dawa terminal market, the cattle were supplied from subsistent farmers East and West Hararghe zones and intensive farms of in the city.

The beef cattle trading were year-round activities for majority of the traders (67.5%). Few proportions of the traders (32.5%) were engaged in beef cattle trading on a seasonal basis. This engagement were during holidays, after crop harvest and based on demands by butchers/institutions most of the year. The male cattle aged between 6 to 9 years marketed on terminal market, which was followed by age group 4 to 6 years. However, beef cattle greater than 9 years rarely marketed. According to the respondents, cattle less than four years were demanded for breeding and draft purpose. The price of cattle was determined through bargain between traders

and buyers. Bargain was based on body conformation and visual observation of the size as weighing scale was not available at cattle market. Harko (2015); Yednekachew *et al*.(2016) reports similar finding on livestock marketing system in Ethiopia is not developed in well, its characterized by markets that lack basic infrastructure, facilities like cattle pen, weighing scale, water troughs, feed and market information.

Table 7. Beef cattle source for Adama and Dire Dawa terminal marketing

Variable	Attribute	%
Source beef Cattle to Adama	Arsi (Deksis, Sagure, Asala)	55
	Bale (Robe, Goro, Goba)	20
	West Hararghe (Hirna, Badesa, Chiro and Galamso)	15
	Intensive farm (Dairy and feed lot)	5
	Other	5
Source of beef cattle for Dire Dawa	East Hararghe (Chalanko, Badeno, Watter and Fadis)	65
	West Hararghe (Badesa, Hirna, Galamso)	25
	Intensive farm and kebele's belong to Dire Dawa	5
	Other	5
Time of beef cattle trade	Year round	67.5
	Seasonal based	32.5
Sex of beef cattle preferred for traders	Only male	67.5
	Only female	2.5
	Both sexes	30
Age category in market	4- 6 year	40
	6- 9 year	55
	>9 year	5
Price determination	Visual judgments	95
	Weight	5

n= Number of respondents

Beef cattle transport
Transport of cattle to terminal markets are presented in Table 8. The survey result revealed that majority of traders (77.5 %) transported beef cattle from primary market to terminal market by vehicle. For nearby markets, they used tracking methods of transport. This indicated that vehicle was common means of trasport for long-distance cattle transport in the study areas. Similar result was reported by Josifine (2013), in which about (79%) of respondents were transported cattle from Ambo to Kera market by vehicle. The average traders transported cattle to destinations market were 118.5±79 km feeding and watering were not practiced by most of traders (65%) during the travels. This indicated the need to create awareness on feeding and watering particularly in long journey.

Most of the traders (75%) transported cattle by mixing different ages, breeds and sex. This might be a causes for transportation stress and even death. This finding was supported by Bulitta *et al*. (2012) who reported that mal-management of animals during transportation increased in the prevalence of death and injuries. Cattle close to terminal market were trekked by foot and had the opportunity to get feed and drink water along the roadsides. As most cattle transport were conducted by vehicle used to transport goods like *ISUZE and trakers* it is important to create awareness on proper uses of vehicle designed like *cargo* for transporting animals. Introducing appropriate vehicle for cattle transport and proper density (space) for cattle need to be aware to traders.

Table 8. Transport of cattle to terminal market

Variable	Attribute	Location				Total n (40)		χ^2
		Adama (20)		Dire Dawa(20)				
		N	%	N	%	n	%	
Ways of transported	By foot	5	25	1	5	6	15	
	Vehicle	14	70	17	85	31	77.5	3.29
	Both	1	5	2	10	3	7.5	
Ways of grouping	Sex	6	30	3	15	9	22.5	2.13
	Breed	0	0	1	5	1	2.5	
	Mixed	14	70	16	80	30	75	
Watering and feeding	Yes	10	50	4	20	14	35	
	No	10	50	16	80	26	65	3.95*
Length of transport	Min	Ma	Mean± SD	Mi	Ma	Mean ± SD	Av.	
	50	350	156±96.3	40	150	81±29.18	118.5±19	25.78*

N = Number of the respondents, Mixed = age, breed, breed, and location. * (P<0.05), SD= standard deviation, Ma= Maximum, Mi= Minimum, χ^2= Chi- square

Perception of the trader on the beef quality determinant
Traders' perception on beef quality determinant in the study areas are presented in Table 9. The result of the study indicated that all the respondents perceived that there were a numbers of factors, which affect quality of beef. The highest mean score on beef quality determinant by traders were beating cattle, availability of feed resource and agroecology of cattle managed. Eventhough determinant factors ranked different, all respondents agree for all factors listed in Table 9 contributed for determine beef quality.

Pre-slaughter animal handling condition like beating (during at production area, transport, market, lairage) mixing (different species, age, breeds), stock density, fighting, feed and water scarce were not only affect the welfare of the animal, but also has greater impacts on the quality on the meat produced from different species (Muchenje *et al*., 2009; Hemsworth *et al*., 211 and Cetin *et al*., 2012).   In this study feeding watering during transport to market and speed of lories ranked as lowest impacts of meat quality determinant.

Table 9.Traders' perception on beef quality determinant (Mean score)

Variable	Mean	SD	Rank	Decision
Beating of cattle	4.48	0.55	1	Agree
Availability of feed resource	4.43	0.5	2	Agree
Agroecology of cattle	4.35	0.53	3	Agree
Age categories of cattle	4.23	0.67	4	Agree
Breeds of cattle	4.1	0.73	5	Agree
Means of transport	4.08	0.85	6	Agree
Sex	3.9	0.84	7	Agree
Cutting parts	3.78	0.62	8	Agree
Cooking methods	3.7	0.68	9	Agree
Slaughter methods	3.68	0.69	10	Agree
Carcass transportation	3.5	0.75	12	Agree
Mixing during transportation	3.43	0.93	11	Agree
Give rest/feed/water during transport	3.3	1.02	13	Agree
Speed of lories at transport	3.25	0.99	14	Agree

Mixing= different age, sex, breed and location, n=Number of respondents, SD= Standard deviation

Preference traders for sex and ages of beef cattle
Traders preference for sex and age of cattle used for beef purpose study areas are presented in Table 11. In the current study, traders preferred male beef cattle aged between 4 to 6 and 6 to 9 years as 1st, and 2nd, respectively, while female cattle between 6 to 9 and 4 to 6 years were preferred, respectively. Beef cattle less than four years were relatively less demanded both sexes for beef purpose. This result was reported by respondent as the lack of well-developed muscle by young cattle under existing production system. However, as the international meat quality point of views greater 4 years beef cattle were as though meat source. Because as age of animal increases meat tenderness was decreased.

Table 11 Traders preference for ages and sex of cattle used for beef purpose

Age (yr)	Male beef cattle ranking value (n=39)						Mean score	Rank
	1st	2nd	3rd	4th	5th	6th		
4-6	24	9	5	2	0	0	69.43	1
6-9	4	23	4	0	0	0	66.65	2
9-12	2	5	20	10	3	0	53	3
2-3	1	2	10	20	3	0	48.05	4
<2	0	0	0	3	18	19	31.03	5
>12	0	1	1	6	13	16	31.05	6
Age (yr)	Female beef cattle Ranking value (n= 25)						Mean score	Rank
	1st	2nd	3rd	4th	5th	6th		
6-9	15	7	6	9	0	0	68.65	1
4-6	9	15	7	3	0	0	64.03	2
2-3	5	5	8	9	6	1	52.68	3
9-12	2	2	11	10	9	0	49.03	4
>12	0	2	1	3	16	12	34.88	5
<2	2	3	1	3	2	23	33.47	6

Preference of traders for cattle breeds
Traders preference for breeds of cattle for beef purpose the study area is presented in Table 12. More than seven breeds were accessed in the market. These breeds have demanded differently based on availability on market. Traders ranked demand of availability breeds on market accordingly Harar, Arsi, Bale, Boran, Karayu, Ogaden (Isa) and crossbreed, respectively.

In general, Harar breed had high demand by butchers than other breeds because of higher tender meat and marbling, according to respondents. They suggested that tender beef from Harar breed used for preparation of special meal, especially for raw meat eater locally called *"Kurt"*. The better tenderness of the breed might be based on feeding system used in Hararghe fattening practice i.e sorghum and maize forage. Sorghum forage has high starch content, which can activities fermentation for the rumen microbial degradation (Ulises *et al*., 2018). Activating rumen microorganism has an advantage to increase feed intake by animal, which result in good body conformation. The genetic contribution for tenderness of Harar breed (sanga) needs further investigation. Similarly, Belete *et al.* (2010) reported that fattened beef cattle from Harar market had premium price up to 50% over the other cattle breed in the Addis Ababa market.

Despite the demand for the breed, traders in Adama terminal market stated that they could not get sustainable supply of Harar breed to market throughout the year. The lack of sustainability might be the production system, which was market not market-oriented. As Dire Dawa was, center for this cattle breed, the market was sustainably supplied with the breed. The Arsi cattle breed was the second preferred breed for beef purpose at Adama terminal market. The demands of Arsi breed was higher by butchers in study area. Traders responded that Borana bulls ages four to six years needed in-feedlot as for export market than local markets. This was due to the good performance of breed on fattening and highly demanded by export market. The current finding is supported by Genet *et al. (2017)* who reported that Boran breed cattle were the most preferred breed for fattening purpose than the other breed types in commercial beef cattle fattening center.

Table 12.Traders preference for breeds of cattle used for beef purpose

Breed	1	2	3	4	5	6	7	N	Mean score	Rank
Harar	23	5	10	2	0	0	0	40	69.85	1
Arsi	14	10	5	4	2	0	1	36	65.14	2
Bale	1	12	4	7	6	7	2	36	55.42	3
Boran	2	7	8	12	6	1	0	36	54.64	4
Karayu	0	0	3	4	20	4	5	36	41.14	5
Ogaden	0	1	2	4	1	16	12	36	34.64	6
Cross	0	0	4	3	1	11	17	36	32.78	7

n= Number of respondent

CONCULUSION AND RECCOMANDATION
Ethiopia has large numbers of livestock resource. However, the contribution of livestock and livestock products potential is underutilized. This study was conducted with the objective of evaluating eating quality of beef produced in wet and dry season at public abattoirs in Adama, Dire Dawa and Haramaya University. Survey data was collected from 90 respondents of beef cattle producers and traders. The data were analyzed by using SPSS version (20). The perception of stakeholders was analyzed through a Likert scale and Garret ranking methods.

Most of the producers were kept cattle for the multiple purposes, except intensive farm around Adama and Dire Dawa that were mostly for a single purpose. Crop residues and natural pasture were the most economically important animal feed resource through-out the year. Depending on the type of crop production, the availability of crop residues was the most access in study areas. Producers kept old cattle greater than 5 years of age. They sold animals for satisfy emergency cash need, purchase agriculture input and fee for children school sale of cattle were, commonly without proper market information. Feed shortage, animal health, lack of stock, lack technology and fattening place were the major constraints of beef cattle production in the study area.

Traders collect cattle from Adama terminal market, which came from Arsi, Bale, and West Hararghe zonal district. Cattle for Dire Dawa terminal market came from East and of West Hararghe zonal districts. The price of beef cattle was determined by bargaining between buyers and sellers. Most of the traders transported cattle to their destination by traveling an average of 118.5±19 km via vehicle animal were mixed irrespective of their ages, breeds, and sex during transport. Traders perceived that beating, scarcely of feed resource and source agroecology were the major factor that influenced beef qualities. Major beef cattle access for Adama and Dire Dawa terminal markets were Harar, Arsi, Bale, Boran, Karayu, Ogade

In general, Harar breed had highly demanded than other breeds local markets. Whereas Boran breeds were demanded for the exporter purpose. Even though the Harar breed had higher demands there was no sustainable supplies to Adama terminal market. However, Dire Dawa terminal market and Harmaya University traders have been sustainably supplied with Harar breed. Based on the conclusion made, it is possible to suggest the following recommendations to improve the quality of beef in Ethiopia.

1. A strategy should be developed that encourage premium payment for young cattle that that were not served for draft purpose.
2. Creating awareness among cattle producers on quality beef from young bulls, on establishing improved forage and improving the nutritional quality of crop residues.
3. Develop breeding improvement design for Harar cattle breeds for continuous supply to markets.
4. Training should provide for producers on scientific ration formulation and feed the animals based on body weight of the animals to hasten finishing time and decrease the problem of feed scarce problem
5. Develop a strategy to introduce weigh-based cattle pricing policy even if at terminal market.

Conflict of interest
The authors declared that there is no conflict of interest between authors and organizations.

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Appendix 1. Garret ranking convert table

percent	score	percent 2	score3	percent 3	score4	percent 4	score5	percent 5	score6
0.09	99	8.33	77	40.01	55	83.31	31	81.99	32
0.20	98	9.17	76	41.97	54	84.56	30	98.32	10
0.32	97	10.06	75	43.97	53	85.75	29	98.58	9
0.45	96	11.03	74	45.97	52	86.89	28	98.82	8
0.61	95	12.04	73	47.98	51	87.96	27	99.03	7
0.78	94	13.11	72	50.00	50	88.97	26	99.22	6
0.97	93	14.25	71	52.02	49	89.94	25	99.39	5
1.18	92	15.44	70	54.03	48	90.83	24	99.55	4
1.42	91	16.69	69	56.03	47	91.67	23	99.68	3
1.68	90	18.01	68	58.03	46	92.45	22	99.80	2
1.96	89	19.39	67	59.99	45	93.19	21	99.91	1
2.28	88	20.93	66	61.94	44	93.86	20	100.00	0
2.69	87	22.32	65	63.85	43	94.49	19		
3.01	86	23.88	64	65.75	42	95.08	18		
3.43	85	25.48	63	67.48	41	95.62	17		
3.89	84	27.15	62	69.39	40	96.11	16		
4.38	83	28.86	61	71.14	39	96.57	15		
4.92	82	30.61	60	72.85	38	96.99	14		
5.51	81	32.42	59	74.52	37	97.37	13		
6.14	80	34.25	58	76.12	36	97.72	12		
6.81	79	36.15	57	77.68	35	98.04	11		
7.55	78	38.06	56	79.17	34	80.61	33		

Source: Garret, 1969