Evaluation of Beef Cattle Feed Resources, Fattening Practices and Marketing Systems in Selected Districts of Buno Bedele and Ilu Abbabor Zones, Western Ethiopia

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Abstract: The study was conducted to evaluate beef cattle feed resources, fattening practices and marketing system in selected districts of Buno Bedele and Ilu Abbabor zones. Both purposive and random sampling techniques were used to select kebeles and target populations. The required data according to the objectives of the study were collected by using primary and secondary data sources. All the collected data were analyzed using SPSS version 20. In the current study areas, three beef fattening practices (Traditional, semi-intensive and intensive systems) were identified. Indigenous breeds were entirely used for fattening and majority of the respondents (89%) were practiced fattening twice/year focusing on future demand and feed availability; and only 2% and 9% were fattening animals three times/year and once/year, respectively. Natural pasture (36%), crop residues (42.6%) and fodder trees and shrubs (15.60%) were among the major beef cattle feed resources identified. Supplementary feeds were provided for the animals mainly during dry season (91.7%); and only 8.3% of them provide during wet and dry seasons. With respect to feeding, animals were allowed free grazing (11.7%), through tethering (30.8 %) and mixed with small ruminants (55.8%). River (70%), tape water (24%) and pond water (6%) were the major water sources for beef cattle in the study area. In the study areas, beef cattle were housed in living room with family (47%), home stead shed (36.5%) and the rest was in barn. During the study period, there was one main beef cattle marketing route and none of the farmers were using scientific measurements to judge when purchasing and selling. Farmers, traders and brokers were the key actors of marketing fattened animals identified. It could be conclude that although beef cattle fattening is effective option for the fatteners and gained prominence as an important sector, there were no regular training, cooperative and accessible market for fattened animals that encourage the sector. Therefore, training and extension advice, best management and cattle fattening cooperatives are urgently required.

Key words: Buno Bedele and Ilu Abbabor Zones; Cattle Fattening; Feed Resources; Marketing System

INTRODUCTION

In Ethiopia, livestock is one of the most potential sub-sectors of agriculture which plays an indispensable role in promoting human health and national economy of the country. Large ruminant, cattle and small ruminants, sheep and goat constitute the major portion of livestock. The present population of livestock is 60.39 million cattle, 32.74 million goat and 31.30 million sheep [1]. Despite the large number of cattle available in the country, the contribution of the livestock sub-sector to the national economy is low.

Cattle fattening helps to meet the rising demand for high-protein foods in the country and plays a great role in enhancing food security, providing households with employment, income, investment opportunity and a store of value. The growing demands for ruminants' meats from city dwellers also present opportunities for fattening as well as improved markets for the animals. Fattening of animals is a highly profitable venture with return of premium to the farmer.

Crop-livestock mixed farming system is one of the predominant farming systems in the rural community of Buno Bedele and Ilu Abbabor Zones. Shortage of land

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due to population pressure, pushing many more farmers either to intensify the cropping system and/ or diversify the system using other integrated activities. Cattle fattening is among an integral componential activities [2].

Despite good fattening potentials (Ample feed resources, market access, huge number of cattle population) are exist in the zones; little attention has been given for the sector. Hence the producers may not benefit from beef fattening activity. Hence, in the study zones evaluation of beef cattle feed resources, fattening practices and marketing systems was indispensable to design development strategy for increasing the production and productivity of the sector.

MATERIALS AND METHODS

Description of Study Area: The study was conducted in selected districts of Buno Bedele and Ilu Abbabor Zones, which are located between the distances of 474-600km, south western of Addis Ababa, the capital city of the country. Astronomically, both zones located at latitude and longitude lies between 8° 27` - 8°45`N and 36° 21' - 36°35` E, respectively. The zones contain highland (10%), midland (67%) and (23%) agro-ecologies; and located at altitude ranges 500- 2575m a.s.l. The annual precipitation ranges from 1500-2200mm with 6 to 9 months of rain fall [3]. The total human population of the zones is 1,492,183 people; of this, about 88% of human populations reside in the rural areas. The farming system of the zones are characterized by mixed farming system, comprising both cropping and livestock production. The study area endowed with huge livestock populations ((1,305, 527- cattle), (386, 669- sheep), (24 8, 602- goat), (125771- equines), (1, 226, 874- poultry) and (492,322-bee colonies)) [1].

Sampling Procedure and Methods of Data Collection
Sampling Procedure: Multi-stage sampling procedures (Random and purposive sampling) were applied for the selection of study areas and household respondents. In the first stage, Bedele, Gechi and Didessa districts from 10 listed districts of Buno Bedele zone; and Hurumu, Mettu and Alle districts from 14 listed districts of Ilu Abbabor zone were purposively selected based on potential livestock production and accessibility. In the second stage, with the consultation of the Districts' Livestock and Fishery Resource Development Office, 3 kebeles were selected from each district based on potential and viability of beef cattle fattening practices.

In the third stage, household respondents were randomly selected from each kebeles on the basis of proximity to the road and ownership of beef cattle. Then the sample size was determined according to the formula given by Arsham (2002):

$$N=0.25/SE^2$$

where;
N = Sample size
SE = Standard error

Thus, by using standard error of 0.038 with 95% confidence level, a total of 180 household respondents were used for interview.

Methods of Data Collection: For this study both primary and secondary data sources were used. Semi-structured questionnaire was used primary data and strengthen by focus group discussions, key informants interview and field observation. And secondary data were collected from zonal and districts agricultural offices, published journal articles, reports and other relevant documents.

Methods of Data Analysis: All the collected data were analyzed with the help of SPSS [4] and reported by using descriptive statistics (Frequency, mean, percentage).

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of the Respondents: The result of the study revealed that majority (90%) of the beef fatteners were found to be male when compared to the female contemporaries, 10%. This finding was slightly in agreement with 81% of male and 19% of female were involved in beef fattening in Debre-Zeit [5]. Less number of female headed households involved in livestock keeping in the current study could probably be due to cultural issues that force females to get married, for economic reason and handling of beef cattle during overall management could be difficult for females [6].

In the present study areas, majority (61.11%) of the respondents were Islam religion followers followed by Christians (Protestant (22.78%) and orthodox (19.11%).

The overall average age of the household heads was 46.5 years. This result indicated that the area has active working force involved in livestock production which was in line with the report of Adebabay [7] from parts of Ethiopia.

Table 1: Socio-economic characteristics of the households

	Ilu Aba Bora Zone			Buno Bedele Zone			
Descriptor	Mettu	Ale	Hurumu	Bedele	Gechi	Didessa	Overall
Gender of household (%)							
Male	93.33	80	100	83.33	100	83.33	90
Female	6.67	20	0	16.67	0	16.67	10
Religion of household (%)							
Islam	56.67	63.33	73.33	40	73.33	90	61.11
Protestant	20	26.67	16.67	26.67	13.33	10	22.78
Orthodox	23.33	10	10	33.33	13.33	0	16.11
Education level of household (%)							
Illiterate	22.5	24.5	35	18	26.67	30	26.11
Read and write	35	33	22	33	46.67	20.5	34.44
Primary school	25.33	26.5	20	26.5	20	13.5	14.44
Secondary school	10.5	13	23	15	6.67	26	18.9
college/university	6.67	3	0	7.5	0	10	6.11

Table 2: Purpose of keeping cattle ranked by owners in the study areas

	Purpose of keeping cattle					
Purpose	1st	2nd	3rd	4th	5th	Index*
Draft Power	109	8	2	0	1	0.34
Income	4	35	50	11	0	0.2
As wealth accumulative	1	15	17	28	0	0.1
For meat	0	3	11	62	0	0.1
For milk	3	58	32	14	0	0.22
Manure for crop land	1	2	5	2	0	0.02
For emergency case	0	2	2	1	2	0.01
Total	118	123	119	118	3	0.99

*Index = sum of [(4 × number of responses for 1st rank + 3 × number of responses for 2nd rank + 2 × number of responses for 3rd rank + 1 × number of responses for 4th)]/(4 × total responses for 1st rank + 3 × total responses for 2nd rank + 2 × total responses for 3rd rank + 1 × total responses for 4th rank).

Educational level of the farming households may have significant importance in identifying and determining the type of development and extension service approaches. It affects household income, adopting technologies, demography, health and as a whole the socio-economic status of the family as well. Majority of the respondents were attending illiterate (26.11%) and primary school (34.44%). Of the total, only 14.44% and 6.11% of the respondents had secondary and college/ university level (Table 1). The current finding was disagreeing with the finding of Belay *et al*. [8] in Dandi district of Oromia region, Ethiopia, (Illiterate 42.3%, primary 43.6%, secondary 3.8%, college/University 10.3%). These low education levels of the society are the challenges on modernization of beef production and commercialization of meat and meat products that requires a continuous training to enable the beef production to move forward.

Purpose of Cattle Production: In the current study districts, farmers keep cattle for different purposes (Table 2). The primary purpose of keeping cattle was for draught followed by milk and income generation as ranked by respondents.

Beef Cattle Fattening Characterizations: In the study areas, beef cattle fattening was characterized into traditional, semi-intensive and intensive systems based on scale of production. In the traditional system, old oxen (87.53%) were highly preferred for fattening while young bulls were preferred for semi intensive (10.8%) and intensive (1.67%) fattening practice.

Beef Cattle Management System
Available Beef Cattle Feed Resources: The principal dry season feed resources available for beef cattle fattening in the study areas were include crop-residue (34.49%),

Table 3: The proportion of beef cattle feed resources available instudy area

Feed resources (%)	Buno Bedele (%)		Ilu Abbabor (%)		Overall mean (%)		
	Wet	Dry	Wet	Dry	Wet	Dry	Total
Natural pasture(grazing)	36.39	4.00	29.11	1.25	32.75	3.25	36.00
*Private grazing	16.22	3.65	4.02	2.25	10.12	2.95	13.07
*Communal grazing	6.84	-	16.12	-	11.48	-	11.48
*Fallow grazing land	9.94	-	7.34	-	8.64	-	8.64
*Roadside feed resources	3.39	0.35	1.63	0.25	2.51	0.30	2.81
Fodder trees & shrubs	4.15	8.25	3.00	15.80	3.58	12.02	15.60
Non-conventional feed	-	2.38	-	6.53	-	4.46	4.46
Improved forage	0.83	0.83	0.33	0.65	0.58	0.74	1.32
Crop residues	2.50	40.67	1.24	40.84	1.87	40.75	42.62
Stubble crops	2.50	5.53	1.24	7.0	1.87	6.26	8.13

stubble grazing (8.13%), shrubs and fodder trees (15.60%), non-conventional feed (4.46%) and etc., (Table 3) in their descending order of magnitude. Whereas in wet season, the principal feed resources were natural pastures (32.75%), fodder trees and shrubs (3.58%) and crop residue and stubble grazing (1.87%) (Table 3). Tesfaye [9] reported the same finding with the current result in Lume district of Eats Shoa zone.

Supplementary Feeds and Feeding System: Traditional fatteners were using non-conventional feeds (Kitchen wastes, salt and local brewery by-product (*Atela*)) and teff straw supplementary feeds for animals. Whereas semi –intensive and intensive fatteners were using agro-industrial by-products and teff straw as supplementary feeds for their fattening animals. In the current study areas, the practices of provision of supplementary feeds for the animal was mainly during dry season (91.7%) when there is shortage of feeds in terms of quantity and quality; only 5.8% of them provided supplementary feeds resources for the animal both seasons (Wet and dry). Besides, majority of the respondents (54.2%) were giving the supplementary feeds for the animal whenever available and 18.3 and 15% provided daily and twice per day respectively. This finding agreed with Shitahun [10] who reported that backyard fattening in Bure Woreda, Amhara Region.

Cattle Grazing Management: With respect to grazing system, more than half (55.8%) of the respondents were grazing animals mixed with small ruminants. In wet seasons when the major feed source is communally grazing, the households were exercising free grazing (30.8%) whereas in dry seasons, about (11.7%) of the respondents were tethering their animals and the left were fed via cut and carries system.

Water Sources and Utilization: River (70%), tape water (24%) and pond (6%) were the major water sources identified in the study areas. With respect to time of water provision, majority (91.4%) of the respondents provided water for the animals early in the morning and 8.6% late afternoon. According to the opinion of the respondents, water scarcity during dry is major problem in the study areas which was in agreement with the report of Zewdie Wondati [11] who reported water scarcity was a major problem during the dry season in Central Rift Valley (Zeway).On top of this, water sources (Mainly rivers) are polluted with uncontrolled flow of different effluents sources which affected and can potentially cause water pollution.

Housing of Fattening Cattle: The use of housing or shelter is one of the most important components of livestock husbandry practices. This is due to the fact that housing helps to protect animals from extreme weather condition on top of its suitability for proper feeding. The results of the study revealed that fattening cattle were housed in living room with family (47%); home stead shed (36.5%) and the rest were in barn. Cattle were housed only during night in open fenced barn (*Mora*) and closed house that was roofed with grass or corrugated and tin sheets. Similar practices were also reported by different researchers, Zewdie Wondati [11] reported animal housed in kraal in Rift Valley (Zeway) and Tadesse [12] reported farmers used open fenced barn that did not have roofing to shelter cattle in Metema district of Amhara region.

Source, Preferred Cattle Type and Frequency of Fattening: All of cattle fatteners (100%) were reported that they used local cattle breed for fattening purpose (Table 4). Like the present result, Ahmed *et al.*[13] reported that all of cattle fatteners in urban and peri-urban

Table 4: Source, preferred cattle type and frequency of fattening

Variables	Categories	Buno Bedele Zone (%)	Ilu Abbabor Zone (%)	Total (%)
Sex of animal used for fattening	Male	100	100	100.0
	Female	0	0	0
Breed of animal used for fattening	Local(Horro)	100	100	100.0
	Crosses	0	0	0
Age of animal used for fattening	Young (1-2year)	2.22	2.30	2.26
	Mature (3-5years)	12.10	8.32	10.21
	Old (over 6years)	85.68	89.38	87.53
Fattening frequency	Once a year	6.10	11.90	9.0
	Twice per year	92.21	85.79	89.0
	Three times a year	1.69	2.31	2.0
Sources of animals for fattening	Own after ploughing	62.65	72.35	67.5
	Local market	18.3	28.3	23.3
	Brokers	11.11	7.29	9.2

Table 5: Selection criteria across different market place and ways of selling fattened animal

Selection criteria for market price	Frequency	Percent of
Colour	39	21.67
Age	23	12.78
Sex	4	2.22
Weight	60	33.33
Breed	54	30
Total	180	100
Ways of selling		
• Live weight basis	33	18.3
• Eye ball estimation	51	28.33
• Both live weight basis and eye ball estimation	73	40.8
• Based on body conformation	23	12.5
Total	180	100

Kebeles of Dessie and Kombolcha Towns, Ethiopia were used local cattle type for fattening purpose. In the study areas, traditionally farmers (87.53%) commonly fatten mature animals (Greater than 6 years old) for short durations (Usually three months) mostly from their own herds in backyard (Table 4). However, some fatteners (12.47%) purchase animals from near market or from elsewhere. Of the total respondents, 67.5% were fattening animals after completing plough activity. The result was in agreement with the findings of Tsegaye and Mengistu [14] who reported that only a small fraction of Ethiopian beef is raised in feedlots.

In the present study areas, majority of the respondents (89%) were practicing fattening activities twice per year especially focusing on future meat demand and availability of different feed resources. Only 2% and 9% were fattening animals three times per year and once per year, respectively (Table 4).

Beef Cattle Marketing Systems in the Study Area: As experienced from key informant interview and focus group discussion, most of the fatteners would like to purchase animals from farm gate and rural small town due to lower price and less competition with big traders. But

74, 19 and 7% of the respondents were selling their animals to farm get, at local market and to traders/retailers, respectively. Small traders also were collecting meat animals from small town and sold them to Mettu and Bedele town in better price especially during holidays. This finding was in agreement with report of Ayele 2003 cited by Tesfaye [9] who reported in the country small traders such as fatteners prefer to purchase animals from farm gate or small town and sell them in big towns. According to the key informant interviews and focus group discussion point of views, reasons for prices variation were involvement of number of traders, seasons of the year, road and transportation accessibility and proximity to urban. The determinants of price of animals (Purchased/sold) were breed (30.22%), weight (33.58%), color (21.7%), age (13%) and to a certain extent sex (1.5%) (Table 5).

As indicated in the above table, the majority of the producers (40.8%) sold their fattened cattle based on both live weight basis and in eye ball estimation at market price and only 12.55 of the fatteners sold their fattened animal on the basis of body conformation. The current findings were in agreement with the results reported by Tesfaye [9] in Lume district of east Shoa zone.

Table 6: Source of beef cattle market information (%)

	Buno Bedele zone			Ilu Abbabor			
Variable	Mettu (N= 30)	Ale (N= 30)	Hurumu (N= 30)	Bedele (N= 30)	Gechi (N= 30)	Didessa (N= 30)	Overall (N= 180)
Development Agents	2(6.67)	3(10)	1(3.33)	1(3.33)	2(6.67)	-	30
Brokers	4(13.33)	3(10)	2(6.67)	4(13.33)	3(10)	1(3.33)	56.66
Media (TV, Radio)	1(3.33)	2(6.67)	-	(3.33	-	-	13.34
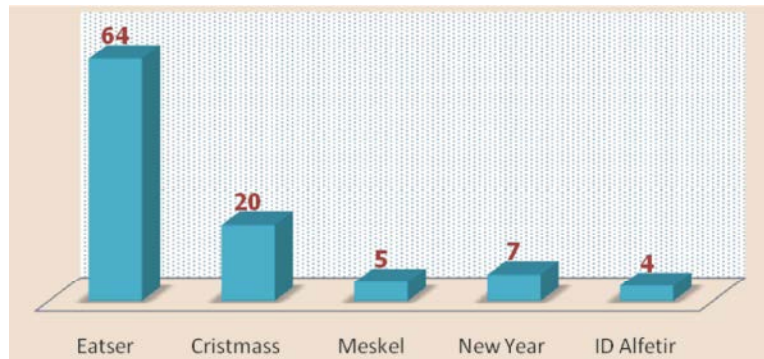
Fig. 1: Marketing seasons targeted for cattle fattening in the study areas (%)

Sources of Market Information and Marketing Seasons:
More than half (56.66%) of the respondents indicated that as they obtain market information from brokers. The other sources of information were development agents (30%) and media (13.34%) (Table 6).

Of the total (64%) of the respondents, were sold their beef cattle during Easter followed by Christmas (20 %) and New year (7%) (Figure 1). The current finding was in agreement with the findings of Belay*et al.*[8] in Lume district of east Shoa zone, Ethiopia, about 72.5% of the fatteners sold their beef cattle during Easter followed by Christmas (10.8%).

Beef Cattle Marketing Routes: During the study period, there was one main beef cattle marketing routes in the study areas. It starts from primary markets (Local markets) to Mettu and Bedele and elsewhere where there is relatively better demand and higher prices. However, according to focus group discussion, the volume of animals transported through this route varies across times of the year mainly during holiday particularly Easter.

Absence of cooperatives, season of marketing and marketing actors were among the factors constrained market price of fattened animals. According to key informant interview and focus group discussions, none of the farmers were using scientific measurements to weigh the live weight of animals when purchasing and selling. In the current study areas, the key actors of

marketing fattened animals were farmers (1st ranked), traders (2nd ranked) and brokers (3rd ranked). This result was in line with the finding reported by Wolde *et al*. [15] from central southern region of Ethiopia.

CONCLUSION AND RECOMMENDATION

In the study areas, cattle fattening activity is a potential and effective option for poor and extreme poor and gained prominence as an important livestock sector. It gives the farmer year round work and provides them with extra income. From the finding of this study, beef cattle fattening are highly depends on natural pasture, crop residues and non-conventional feeds. Moreover, the overall management systems provided to the animal is unimproved. Even though cattle fattening business is profitable and worth venturing as a source of year round income and play a vital role in poverty reduction, creation of self-employment opportunities in rural areas and animal protein supply, there are no adequate regular training, cooperative and easily accessible market for fattened animals that affecting profitability of cattle fattening. Thus, training and extension advice are urgently required in selection, feeding, healthcare and market information and cattle fattening cooperative to improve the performance of cattle fattening practice in the study areas and also to disseminate the practice in to other areas having similar agro-ecology and resources.

ACKNOWLEDGEMENTS

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