Evaluation of husbandry practices and constraints for cattle fattening in Bench Maji zone, south west Ethiopia

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Abstract

A study was conducted with the objective to evaluate cattle fattening husbandry practices and constraints in Bench Maji zone south western Ethiopia through 11 focus group discussions, field observation and interviewing 301 cattle fattener households which were selected purposively by pre-tested, semi structured questionnaire. Cut and carry (46.44%), tethering (24.0%) and free grazing fattening (29.56%) cattle fattening system were practiced. The major feed resources in the study area were Weeds from crop land and Thinning and leaf parts of maize(Zea Mays) (43.5%); Aftermath grazing and Leaf and stem parts of Este pathos (Draceana steudeneri) (24.4); Natural grass and stem and leaf parts of enset (Ensete ventricosum)23.26%); and Leaf and stem parts of Banana(Musa sapientum) and sugar cane(Sacharum Officinarum) (10.1%). From the total of household respondents the supplementary feed sources which was used for fattening purpose were Roasted/cooked maize(Zea Mays) grain, Cooked kocho(Ensete ventricosum) and Taro(Colocasia esculenta), and Table salt, 36.75%, 31.27% and 31.52% respectively. The duration of fattening, umber of fattening cycle per year and number of cattle per cycle was 3.4 month, 2.05 and 3.8 respectively. Selection indexes 0.57, 0.48, 0.33, 0.81 shows physical Appearance/shape, Body Size, sex and Age respectively were fattening cattle selection criteria in the study zone. The current result shows that 31.11% provide houses or some form of shelter to their fattening cattle. The performance of beef cattle is challenged by awareness (0.47), feed (0.184), lack of extension service (0.15%) and cattle disease (0.10%) in order of importance. Therefore the great intention is needed to improve cattle fattening system, through awareness creation/extension service, improved forage development and locally resourced feeds utilization and preservation intervention. Similarly experimental researches on chemical composition of used local feed resources and large scale research on beef marketing and their contribution to food security in the area is needed.

INTRODUCTION

The country Ethiopia has the largest livestock population in Africa; however, in the production of the major food commodities of livestock origin has been poor compared with other African countries and world average (Befekadu and Birhanu, 2000). A sub sector cattle fattening on a small-scale is emerging as a profitable, low-risk and low-input livestock enterprise for smallholders (EARO, 2002). Livestock fattening is one of the best ways for farmers to quickly realize returns on improved forage production investment Alemayehu (2002). This shows that beef cattle fattening activity could be one potential source for employment opportunity to alleviate poverty in the country if considerable attention is given for this sub sector. Though the country has a great potential for beef production, constraints such as feed scarcity, disease prevalence, shortage of improved breeds, weak extension education services, lack of skill to feeding and general fattening management, land shortage, inadequate credit services and unorganized marketing system and general lack of animal care (Berhanu and Befekadu, 2000; IBC, 2004). Thus the benefits from this sector is remain marginal and could not satisfy the need of the growing population and production per animal is extremely low (MOA, 2005; Aynalem *et al*., 2011). Similarly, no serious attempt has until now been made with national selection programs to improve the beef merits of indigenous cattle in Ethiopia (Aynalem *et al*., 2011).

According to Shewangizaw (2016) livestock and meat products have been among the fastest growing components of the global agriculture and food industry. This growth reflects not only increasing demand for meat as global incomes have risen, but also improved efficiencies in production, processing and transportation declining real feed prices (Morgan and Tallard, 2015). Global meat trade is forecast to expand at a moderate rate of 1.7 percent in 2015, to 31.2 million tones, a significant slowdown from the 3.1 percent registered last year (FAO, 2015). Meat production and consumption is important in the Ethiopian economy and ruminants contribute over 3.2 million tons, representing over 72% of the total meat production (Belete et al., 2010). Even if, the Cattle population in the majority of tropical country is higher, there is a strong unsatisfied demand, due to the increment of population growth in the majority of tropical countries, for milk and meat (FAO, 2015).

In Bench Maji zone crop-residue treatment, utilization, local resourced feed preservation activities were not practices observed. Farmers in the study area consider their livestock to be reliable source of input for crop production and income generation options. Animals were purchased and sold according to the need of farm labor, cash need of the family and investment opportunities. However, poor managements in relation to feeding system, healthcare, housing etc. reduced the performance of cattle fattening and the return that would be obtained from this sector unless appropriate improvement strategies have to be introduced. Therefore making an effort is needed to improve productivity of beef cattle by increasing crop sourced animal feeds in quantity and quality through integrated livestock and cropping systems; and forage development through adoption of different improved forage species. In general improving husbandry practices and awareness of farmers participated in fattening activity is essential. To develop a sustainable beef cattle production system in

the study district, it is prime important to find out the existing husbandry practices and constraints which are directly related cattle fattening system. Thus, on the basis of this background this study was conducted to address some research questions about improvement strategies of the husbandry practices and constraints of cattle fattening with the objectives- to evaluate cattle fattening husbandry practices on-farm level**,** assess current cattle fattening constraints in the district and to propose appropriate cattle fattening improvement intervention strategies.

MATERIALS AND METHODS

Description of the Study Area The study was carried out in Bench Maji Zone (BMZ) which is found in the Southwestern Ethiopia in Southern Nations Nationalities and Peoples State (SNNPS) in peri-humid agro-ecological zone of southwestern Ethiopia. The zone has a total surface area of 1,925,200.206 km^2 (BMZLFDO, 2014). This area is located in south west Ethiopia between geographical coordinates of between $5^o33'$ and $7^o21'$ N Latitude and $34^o88'$ and $36^o14'$ E Longitude, at an altitude that ranges from 500 to 2500 meters above sea level (masl). The temperature varies as of the agro-ecological zones from 15.1-40^o**c**. The climate of the area is characterized by along rainy season (June-October) accounting for 75% of the annual rainfall having a peak falls in September. The short rainy season extends from March to May with a peak fall in May and the dry season occurs between November and February. In recent years, however, the area has experienced a great variability in terms of occurrence and amount of rainfall causing crop failures on several occasions (BMZLFDO, 2014). The mean annual rainfall ranges from 400 to 2000 mm (BMZLFDO, 2014). The main livestock species reared and estimated to be found in the zone are cattle 321,980, sheep 124,093, goats 75,719, poultry 1, 025, 385, horse 8,414, donkey 2,219 ,mule 1,299 and beehives 86,399 (CSA, 2014). Traditional subsistent mixed farming system/ both livestock and crop farming, is the common practice in the area.

Sampling Procedures

An investigation visit was made in advance before the main survey to familiarize with the existing farming system and to identify the cattle fattening practiced Kebeles of the study districts. A purposive multistage random sampling technique was used in order to determine the number of districts, Kebeles and fattening households from the study area. At the first stage based on the cattle fattening activity from the all districts of zone, the three districts such as Shie Bench, North Bench and Guraferda were selected purposively. At the second stage the sample Kebeles were selected purposively from each district based on their suitability for cattle production and cattle fattening and accessibility to market and road. At the third stage simple random sampling frame was developed to select 301 fattener households across the Kebeles according to proportion of respondents in each Kebeles from each stratum. Using the population list of cattle fatteners, the sample size was determined by using the simplified formula for proportions designed by Yamane (1967),

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

Where, N = population size,

n = sample size and

e= level of precision (5% in this case)

Methods of Data Collection

The survey was implemented using semi-structured interview. Similar questionnaire having open-ended and closed-ended questions were developed. The questionnaire was translated in to Amharic language, pre–tested and re-framed in such a way that interviewing households would respond without difficulty and biasness and then administered on study households. Focus Group discussions were made with agricultural development agents and focus group discussions, key informant contacts, informal talks and secondary data sources were used to collect basic information. The focus group discussions were guided by considering their age and experience with cattle fattening activity to know the sets of questions: priority feed resources, land utilization pattern, fattening practices/systems and major constraints for cattle fattening. Field observation was made to enrich the data about feeding, watering, housing, and healthcare of the fattening cattle, utilization and management of feed resources.

Statistical Model and Data Analysis

Cattle fattening practice was assessed considering the general husbandry issues like fattening system major feed resources, watering, housing; source of fattening cattle, selection criteria for purchasing of fattening cattle, method and length of feeding, season of fattening. SAS, (20) software was used to analyze quantitative and qualitative data using descriptive statistics and GLM procedures. Chi-square (X2) test will also employed to test the association of different categorical variables was included in this study. A significant mean difference was declared using Duncan test procedure. Index of response was used for estimating selection criteria for fattening cattle and constraints.

RESULTS AND DISCUSIONS

Livestock holding

The average livestock holding in the study area is 4.8, 2.4, 2.3, 8 and 1.1 for cattle, sheep, goat poultry and horse, respectively. High number of cattle was reared by respondents than other livestock except poultry. Households in Shie and North Bench districts rear significantly ($P<0.05$) higher number of cattle and goats than the Guraferda district (Table 1). This may be due to high demand of livestock as input functions and more sources of cash in the study place. This may also due to more communal grazing land and cropland availability from which higher proportion of livestock feed is derived.

Table 1. Livestock holdings of respondents in the three districts of the study area

Livestock No. (Mean ± SD)	Shei Bench	North Bench	Guraferda	Overall
Cattle	5.1± 2.6[a]	4.8±3.6[b]	4.5±3.8[b]	4.8±3.0
Sheep	3.3±1.1 [a]	3.5±1[a]	0.4±1.03 [b]	2.4±14.0
Goat	1.8±1[a]	2.7±1.1[b]	2.7±1.2[b]	2.3±1.0
Poultry	8.6±4.2	7.5±3.7	8±4.0	8.0±4.0
Horse	1.2±0.6	0.7±0.6	1.00±0	1.1± 0.4
Donkey	0.1.±2 [a]	1±1.2 [b]	0.3±1 [a]	0.47±1.3

[a,b] means with different superscript were significantly different between districts ($p<0.05$), SD=standard deviation

Land resource and utilization

As the mean descriptive statistics of the Table (2) shows, the average cultivated land

including fallow land holding per household were equal to 2.02±0.04ha, 2.12±0.033ha and 1.98±0.05ha in Shie Bench, North Bench and Guraferda, respectively and average 2.04±0.03 ha in the study area. This creates the opportunity for crop residue feed resourcing for livestock fattening in the study area. The present study was similar with the result of Shitahun (2009) and Amistu *et al.* (2016) reported land utilization in Bure Woreda and in Hadiya zone respectively. This showed that many farmers are converting grazing land in to crop lands.

Table 2. Land utilization in the study area

Land resource(hectare) (Mean ± SD)	Districts			
	Shie Bench	North Bench	Guraferda	Overall mean
Backyard	0.5±0.02 [c]	0.31±0.02 [a]	0.21±0.02 [b]	0.22±0.02
Cultivated land including fallow land	2.02±0.04	2.12±0.033	1.98±0.05	2.04±0.03
Private grazing land	0.15±0.01 [a]	0.1±0.02 [a]	0.31±0.01 [b]	0.13±0.02
Area under forage cultivation	0.0012±0.3	0.002±0.02	0.001±0.1	0.0010±0.03

[a,b,c] means with different superscript were significantly different between districts ($p<0.05$), SD=standard deviation

Even if crop residue utilization in the study area was not totally practiced, this report revealed that the region has an opportunity to use crop by products for beef cattle production. While the mean grazing land per household of the respondent revealing that little (0.13±0.02) land was given to grazing of livestock. The indicated mean value (0.0010 ha) of land available for forage cultivation represents very low forage development practices in the study area. The significance ($P<0.05$) variation of backyard land source in Shie bench and north bench districts from the Guraferda was has an opportunity to grow dry period resistant and high water holding vegetables for home consumption and livestock feeding.

Cattle fattening systems

This study classifies beef cattle fattening system according to feeding systems identified by husbandry strategies and approaches of the study area. Classification of cattle production systems in the world identifies such factors as feeding systems, purpose of cattle rearing, farm intensification, cattle genotypes and terrains, and scale of production. Tung et al. (2009) also classify cattle production according to different feeding systems based on modes of cattle keeping. In fact the general cattle production system in the study area is practiced in mixed farming systems that combine crop production and cattle production together with of small scale beef cattle production system but in particular this study in detail classifies beef cattle fattening system as free grazing, cut-and-carry (stall feeding) and tethering system (Table 3). The two option of stall feeding, and stall feeding with grazing were previously reported from southern Ethiopia (Shewangizaw et al., 2014).

Most (46.44%) of the studied households in the study zone were practicing cut and carry system of beef cattle production followed by free grazing system (29.56%) (Table 3). There is significant difference of cattle fattening systems in the study districts of the Bench Maji zone (Table 3).

Table 3. Beef cattle fattening schemes in the study districts of Bench Maji zone

Fattening schemes **(%)**	Districts				
	Shie bench	North bench	Guraferda	Overall	x^2
Cut and carry system(stall feeding)	72.67	44.67	22.00	46.44	32.1**
Tethering system	11.33	25.33	35.33	24.00	17.4**
Free grazing system	16.00	30.00	42.67	29.56	12.4**

The Chi-Square values denote significant differences between districts ($p<0.05$), ns=non significant SD=standard deviation, **=$p<0.01$

Significantly ($P<0.05$) higher number of households in Shie Bench district were practiced Cut and carry system of cattle fattening followed by North bench than Guraferda district. The finding shows that the culture of cattle fattening management, feed resource and awareness difference might be the reason for variability of fattening system between studied districts. The cut-and-carry cattle feeding system refers to households that keep cattle in a stable. Fattening cattle were housed in stables and provided feed, including natural grasses, tree leaves, and/or planted grasses, with a supplement of Cooked kocho(*Ensete ventricosum*) and Taro(*Colocasia esculenta),* for various lengths of time depending on each household as claimed by respondents. Fattening animals are often confined for fattening throughout fattening period before selling (from one to three months or longer time depending on the owner's capacity).

The field observation and focus group discussion insured that in free grazing system the main or basal feed resources for cut and carry system were used as supplementary feed such as maize(*Zea Mays*) or mixed feed (a combination of different vegetables like banana(*Musa sapientum*) stems with or without maize(*Zea Mays*). Farmers explain that in cut and carry system, fattening bulls is efficient in the short term and is much better than other cattle feeding methods. This finding is also supported by Niem *et al.* (2001); Nho *et al.* (2003); Huyen *et al.* (2006); Tra (2007). Further different production systems livestock often resulted in different economic efficiencies (Quan, 2001).

The cut-and carry and tethering systems of cattle fattening was similar with Hararghe highland cattle fattening system which is the third division of Ethiopian cattle fattening system. The major reason tethered feeding practiced in the Hararghe fattening system to a large extent was small land holding (Matawork, 2017). The predominant animal feed in dry season was Stover and crop residues followed by natural grazing. Cut and carry system was practiced for feeding of the grass, residue, Stover and/or weed (Estefanos, 2014).

Feed resources invested in fattening cattle were simple, low-cost family-produced feeds, except for the hard work to cut and carry natural feed resources, especially in wet season. Therefore, households revealed that large number of them fattened cattle in wet season in cut-and-carry system and they often fatten two-four cattle per time due to available feed resources. Cattle raised in the cut-and-carry system exhibit a good appearance due to the care they receive and the fattening process, which increases the value of the animals and makes them easy to trade. Thus, farmers had a chance to convert low-value products to high-value cattle products.

Allowing cattle to tether and graze part or full-time is also seen during field observation. Fattening animals were sometimes tethered near crop farm and fed

on thinned and leaf sorghum and maize (*Zea Mays*). In cropping season, farmers keep their stock at home in the morning, and are taken out to graze in tethered place by their owners. In selected households, they replied that a regular check was made according to individual family strategy and labor availability. As a unique management tool, farmers participated in fattening operation separate animals for fattening from other herd and restrict movement of animals by tethering them; thereby prevent loss of energy for search of feed and water (Teshager *et al*., 2013).

In the study area, the free grazing system refers to that allow cattle to graze freely without being controlled by the owners. Households practicing this system have not good market access due to poor body condition. After harvesting, cattle are allowed to graze all day in the fields until the next planting seasons, and are sheltered at night. Cattle graze on unplanted land, common land or fallow land. This method of cattle production is also reported by Shitahun (2009) Shewangizaw (2014) in different parts of Ethiopia. Especially in Guraferda district fattening cattle were raised in free grazing land for their draught power and subsequent fattening in free grazing lands. This practice suffers their cattle from fly biting in the field and they must treat their cattle at least monthly which cause poor body condition and chemical residue risk for beef production because of their cattle have to periodically treated drug injection to control the prevalent trypanosomiasis disease infestation. This might be affect market value of the live beef animal and consumer safety.

Depending on the intensity of fattening practice in the study area semi intensive (cut and carry or stall-feeding system) and extensive small scale beef production system was practiced due to the fact that extensive system consisted of grazing their own croplands after harvesting crops, grazing on roadside and grasslands. Most of the Ethiopian beef is produced under an extensive low input system and in conjunction with crop and small ruminant production (SPS-LMM, 2011). As generalized by Alemayehu (2004) feeding systems in Ethiopia include communal or private natural grazing and browsing, cut-and-carry feeding, hay and crop residues. But feeding of hay and crop residue in this study zone was not practical which contradicts such reports from other parts of the country.

Feed and water resources

The major feed resources in the study areas were Weeds from crop land and Thinning and leaf parts of maize(*Zea Mays*) (43.5%); Aftermath grazing and Leaf and stem parts of Este pathos *(Draceana steudeneri*) (24.4), Natural grass and stem and leaf parts of enset(*Ensete ventricosum*) (23.26%) and Leaf and stem parts of Banana(*Musa sapientum*) and sugar cane(*Sacharum Officinarum*) (10.1%) (Table 4). In Guraferda district natural pasture from different fields and aftermath grazing were the major feed resources for to fatten their cattle. The current study not agree with the report of Tolera et at., (2012) who reported natural pasture and crop residue to be the major feed resources for highlands of Ethiopia. There are crop residues that can be used for feeding fattening cattle in the study place but there is no feeding culture due lack of awareness about treatment of these feed resources. Teff and sorghum in both Shie bench district; and rice and sorghum in Guraferda district is important crops, however, the farmers were not used these crops residues as feed resources during feed shortage season. Feed shortage was resolved mainly by purchasing supplement grains in some households, using browse trees, never by storing the feed during available and crop residues in the area as a hay or silage making . The

report of Belay (2017) in Wollega Zone, the high proportion of producers provides crop residues and grazing of natural grasses which is contradictory with this study. Similar scholar reported that, most of the framers grows at least one type of the improved forage Varity either (Rhodes (*Chloris gayana*) or elephant grasses (*Pennisetum perpurem*)) and provide for fattened a animal which is differ from this result. Additionally, Shewangizaw *et al*. (2014) reported 49.76% of farmers in Central southern parts grows improved forage Varity and supply to fattened cattle. The finding is not agreed with the result that showed some of the sampled households grow improved forage Varity in North Ethiopia (Ayenew, 2012).

Sources of supplementary feed for fattening cattle in the study zone are indicated on Table (4). From the total of household respondents the supplementary feed sources which was used for fattening purpose were Roasted maize(*Zea Mays*) grain, Cooked kocho(*Ensete ventricosum*) and Taro(*Colocasia esculenta)*, and Table salt, 36.75%, 31.27% and 31.52% respectively. This result is contradictory to the reports of Takele (2009) and Shewangizaw *et al.* (2014) which reported cattle fatteners provided supplements of raw Enset and Banana leafs and improved forages. Enset is drought-tolerant, multi-purpose crop contains starch and other minor/trace elements and also play vivacious role in medicinal values (Azene and Abebe, 2017). Similarly enset value for livestock was described by Mohamed *et al. (*2013) as Enset corm contained 17 of 20 amino acids and had similar or higher concentration than potato. Accordingly households inclusion of Taro in the livestock ration provides potential dietary energy for fattening cattle which is supported by findings of Alcantara *et al* (2013) as explained as high level of carbohydrate content observed in taro, taro powder, noodles and cookies.

Table 4. Feed and water resources in three districts of study area

	Districts				
	Shei Bench	North Bench	Guraferda	Overall	X^2
Variables	**N=119**	**N=80**	**N=102**	**N=301**	
Basal Feed resources (%)					
Weeds from crop land and Thinning and leaf parts of maize(*Zea Mays*)	28.6	34.2	67.7	43.5	14.4*
Aftermath grazing and Leaf and stem parts of Este pathos *(Draceana steudeneri*)	33.4	22	17.8	24.4	10.3*
Natural grass and stem and leaf parts of enset (*Ensete ventricosum*)	22.3	31.5	16	23.26	7.4*
Leaf and stem parts of Banana(*Musa sapientum*) and sugar cane(*Sacharum Officinarum*)	17.5	12.8	-	10.1	33.5**
Available supplementary feed (%)					
Roasted maize(*Zea Mays*) grain	46.67	28	35.6	36.75	60.1**
Cooked kocho(*Ensete ventricosum*) and Taro(*Colocasia esculenta)*	33.38	61.33	-	31.27	27.4**
Table salt	19.5	10.67	64.4	31.52	23.7**

Water sources (%)					
River	43.1	40.7	45.6	43.13	4.3
Spring	31.4	33.5	20.1	28.33	12*
Hand dug well	13.0	9.8	22.9	15.4	10.2*
Pumped water	12.5	16.0	13.4	14.0	9.5

The Chi-Square values denote significant differences between districts ($p<0.05$), ns=non significant SD=standard deviation, *=$p<0.05$, **=$p<0.01$

Similarly the result of never growing improved forage Varity in the study area has contradictory message with the finding that stated as; in many area of Ethiopia farmers have renewed interest to improved forages for feed production and natural resources management (Azage *et al*., 2010). Suitable strategy is needed to promote new techniques of storage and process by-products such improved feeding technologies, urea treated straw and Urea Molasses Block supplement inclusion.

Respondents used river, spring, hand dug well and mechanical pumped as the source of water for their cattle. According to the respondents' response, the three types of water sources identified in the study zone river (43%), spring (28%), Hand dug well (15.4%) and mechanical pumped (14%). The respondents revealed that fattening cattle have got access to the water source within a day and the fattening cattle could fulfill their water requirement for better body condition. Generally in the study area water source for the cattle was not a big problem.

Source of feeder cattle, selection criteria and fattening length

The result showed statistically not significant difference ($P<0.005$) in source of animals for fattening in three districts of the zone (Table 5). Large proportion of the respondent; 68.67%, reported the source of fattened animals were from market purchased. The finding of Teshager *et al*. (2013) who reported 81% of fattened cattle in Ilu Aba Bora Zone of Western Oromia was, from their own farm which contradicts this study result. However, the finding of Belete *et al*. (2010) who reported similar result that the source of animals for fattening were oxen purchased for tillage and fattened after tillage/ from herd.

In the assessment of duration of fattening, farmers responded they fatten their animals in 4.4 month in the study zone. This is in contrast with the finding of Belete *et al*. (2010) that reported most farmers in area follows traditional oxen fattening that is finalized in one to three month. Similarly the result disagree with the result of Traditional Cattle Fattening System in Ilu Aba Bora Zone of Oromia regional state, Ethiopia, that showed the minimum cattle fattening period was 4 months (Teshager *et al*., 2013). Highly contradictory report was also reported from Amhara Region, North Ethiopia; Farmers traditionally fatten oxen after the completion of tillage for six months (Belete *et al*., 2010). According to Habtemariam (2000) farmers in east Ethiopia fed oxen for more than one year and Takele and Habitamu (2009) in Wolayta area reported 3-6 months.

Table 5. Source of feeder cattle, fattening length and fattening potential in the study zone

Variables	Districts			
Feeder cattle source	Shie bench	North bench	Guraferda	Overall
Purchased (%)	70	71.3	64.67	68.67

From herd (%)	30	28.6	35.33	31.33
	mean±SD	mean±SD	mean±SD	mean±SD
Fattening length (Month)	4.1±4[b]	4.7±27[a]	4.5±3 [a]	4.4±33
Fattening cycle	2.1±02	1.8±2	2.3±12	2.06±03
No of fattened cattle per cycle	2.1±25[a]	2.01±18[a]	1.5±32[b]	1.86±26
No of fattened cattle per year	4.4±3 [a]	3.6±23 [b]	3.45±17 [b]	3.8±20

[a,b] means with different superscript were significantly different between districts ($p<0.05$), SD=standard deviation

In the current study the average recorded fattening cycle was 2.06, while the value was not show significant difference between study districts (Table 5). The result of Takele and Habitamu (2009) showed that the average number of fattening cycle per year was 1.55 and the reported average number of stall-fed cattle per cycle was 1.27 which is not agreed with current study. The present study declares that body size is the most (0.48) prominent selection criteria that fatteners consider when they purchase fattening cattle (Table 6). Similar with Takele and Habitamu (2009) and Shewangizaw *et al*.(2014) cattle fatteners select fattening cattle by body size, good body condition and big and stand high-hump in addition to coat color and sex. According to Takele and Habitamu (2009) cattle fatteners in Wolayta select cattle those have better body condition, physical appearance, age and sex for fattening which is agreed with current study but the contrary result was reported which is farmers select cattle that have attractive look that would get market demand (e.g coat color) in the same study area. Cattle with different age and body condition are purchased for fattening and this would result in a considerable variation in the level of fattening.

Table 6. Selection Criteria for beef cattle selection as ranked by respondents in the study area

	Districts			
Parameter	Shie bench	North bench	Guraferda	**Overall**
Selection Criteria	Index	Index	Index	Index
Body Size	0.490	0.480	0.470	0.48
Appearance/shape	0.011	0.160	0.001	0.57
sex	0.410	0.170	0.430	0.33
Age	0.070	0.094	0.080	0.81

Index= sum of (3 X selection criteria ranked first + 2 X selection criteria ranked second + 1 X selection criteria ranked third) given for each districts divided by sum of (3 X selection criteria ranked first + 2 X selection criteria ranked second + 1 X selection criteria ranked third) for all district.

Housing of Fattening Cattle

The current result shows that 31.11% provide houses or some form of shelter to their fattening cattle (Table 7). Most of the households use separated house (stall) for fattening oxen and some of them use confined with other livestock. The use of stall and confining beef cattle with other livestock has some demerit (competition for feed, diseases transmission, overcrowdings, and poor hygienic condition (Amistu, 2016). Farmers were housed their cattle due to regular threat of theft especially in Guraferda district. Most (68.9%) of the cattle fatteners share their fattening cattle with their living home. There is significant difference between districts of the study zone might be due to tradition and awareness difference in importance of livestock housing (Table 7).

The family leaving house section is divided into two or three parts, one part for bedding the animals, one part for family. Almost all animal housing consisted earthen floors. Cleaning was irregular and the space provided was inadequate for the adult animals when observed while the animals were in their stall especially where the farmer own more number of animals. The focus group discussion argued that the purpose of housing is to create warm condition, to minimize heat loss, to keep cattle from thief and predation, and for close supervision. In similar to current study Asrat *et al, (2013*), indicated cattle are house together with family and some also in separate house. Desalegn (2015), also reported similar result all farmer house their cattle separate house not far from family house at night to protect them from cold, rain, predators and theft.

Table 7. Housing practice and type of housing in the study districts of Bench Maji zone

Variables	**Districts**				
	Shie bench	**North bench**	**Guraferda**	**Overall**	**X^2**
Separated house	20	34.67	38.6	31.11	**22***
Housed with family	80	65.33	61.33	68.89	**13.5***

The Chi-Square values denote significant differences between districts ($p<0.05$), ns=non significant SD=standard deviation, *=$p<0.05$

Constraints on cattle fattening

As an index value indicated that that awareness (0.47) and feed (0.184) were the most important limiting factor for their beef production in the study area. Lack of extension service is also the third important limiting factor followed feed problem (Table 8). In Guraferda district the index value 0.26 shows that fattening operation was mostly influenced by disease infestation problems over the other districts. According to the respondents argument in group discussions claim that, processing and preservation of silage, straw treatment with urea is not experienced in due to lack of knowledge. Treatment of straw with urea has currently received global attention because of easy access of urea at village level, cheaper price and its ability to break down cellulose besides adding non-protein nitrogen (NPN) to the straw. Silage is making from crop residues, greases, browse tree, waste of enset and agriculture or agricultural products that have been preserved by natural and artificial acidification for use of animal feed in periods when feed scarcity or dry season. Silage feed to livestock is increase the intake of feed (very palatable), milk products, body weight gain and digestibility. Therefore, such like understandings were not made in farmers' level or even it might be at extension workers level which calls for well-organized intervention to utilize locally available and cheapest feed resources to convert to nutrient full animal product.

Table 8. Factors for beef cattle production in the three districts of the study area

Factors	Shie bench	North bench	Guraferda	Overall
	Index	Index	Index	Index
Awareness	0.490	0.460	0.460	0.47
Lack of Credit	0.090	0.070	0.090	o.o83
Feed	0.246	0.248	0.060	0.184
Disease	0.020	0.030	0.262	0.10

Lack of extension service	0.150	0.177	0.120	0.15

Index= sum of (3 X factor ranked first + 2 X factor ranked second + 1 X factor ranked third) given for each districts divided by sum of (3 X factor ranked first + 2 X factor ranked second + 1 X factor ranked third) for all district.

Table (8) shows that near 50% (0.47 indexes value half of one) respondents mentioned that awareness of the feeder cattle management is the greatest problem for small scale cattle fattening. Study conducted in Fogera of Amhara region showed feed shortage was the major constraint for cattle fattening (Belete *et al*., 2010). In the same way inadequate feed, widespread diseases, poor breeding stock, and inadequate livestock policies with respect to credit, extension, marketing and infrastructure are the major constraints affecting livestock performance in Ethiopia (Desta *et al.,* 2000).

Conclusion and recommendations

Feed resources invested in fattening cattle were simple, low-cost family-produced feeds, except for the hard work to cut and carry natural feed resources, especially in wet season. None of crop residue utilization; storage and preservation such as hay making, silage and feeding system for cattle fattening of farmers practiced due to lack of awareness. Similarly of unavailability of or non of concentrated feed supplementary agro- industrial by products such as oil seed cake, molasses, wheat bran feeds were made the sector couldn't serve the expected performance/product. Fattening length and fattening cycle per year was below that of the ideal expected performance. Practiced selection criteria in the study zone were very approach to scientific ways of beef cattle selection that farmers practiced in the study area (especially better body condition, age and physical appearance) although other management units found poor. The use of poor house and confining beef cattle with other livestock in the study area suffered poor hygienic condition, competition for feed, diseases transmission, overcrowdings and intern leads for extending fattening length and poor beef performance and lowers market demand. Awareness is recorded as the most important limiting factor for their beef production which hinders farmers to utilize plenty of local resources for beef production. In this study region very short dry season and long productive seasons is there hence there is opportunity for preparation and conservation of wet season extra feed resources however, beef production environment was not utilized by different identified reasons. In general even if the beef production is supporting the livelihood in the study zone; however, suffer from lack awareness and poor feed resource management, utilization, preservation, treatment and development. Extension policies and awareness creation strategies on fattening practices, feed improvement strategies, empowering the farmers so that they can provide high-quality, sustainable beef cattle production and they should have access to basic production in puts and further researches on chemical composition of used local feed resources and beef marketing and their contribution to food security in the area is needed.

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Competing interests

The author has no competing interests to declare.

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