



## **Study on beef cattle production management practices and constraints in Gondar town North West, Ethiopia**

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### **Abstract**

A cross sectional study was conducted from October 2015 to April 2016 to characterize beef cattle fattening production system and constraints in Gondar town district, North Gondar Zone. Structured questionnaire and a onetime observation were conducted on a total of 70 beef cattle producers which were included purposively in the study using systematic random sampling to generate the data set. The study revealed that majorities of the respondents were adult males with education level of primary and secondary school the rest were female. About 42.9% of the respondents used big and stand hump whereas the rest of the respondents use wide and deep body frame as selection criteria of cattle for fattening. The length of fattening period was 2 months for 40% of the respondents, three months for 38.6% of the respondents and above three months 21.4% respondents. The major feed resources were hay, crop residues and brewery byproducts. According to the respondents 41.4% and 37.1% owners use wheat straw and hay respectively as supplementary feed. 98.6% of respondent's used twice/day feeding system, while the remained fed their cattle three times/ day. None of the respondents use any scientific ration formulation. All fatteners did not provide feed based on body weight and about 87.1% of the respondents provide change feed type and amount by providing increase concentrates at finishing phase. The source of water, in the study area according to respondents 70% and 30% were river and tape water respectively. Feed cost increment and lack of credit ranked 1st and 2nd respectively by respondents.

**Keywords:** *Beef cattle; constraints; fattening; Gondar; selection criteria*

### **1. ZIntroduction**

Ethiopia, like most of the countries in sub Saharan Africa, is heavily dependent on agriculture. The agricultural sector plays an important role in the overall development of the country's economy. This sector plays a major role in the national economy and it is the source of income and employment for the rural population (Negus, 2001). Ethiopia has the leading livestock population in Africa and the animal population census (Bailey et al., 1999). Estimates of

the livestock population of Ethiopia are 44.32 Million cattle, 23.62 Million sheep, 23.33 Million goats, 2.31 Million camels and over 42 Million poultry. Estimates 1.1% growth rates for cattle which are against a backdrop of 2.5% human population growth per annum. In other words, the livestock population growth has been lagging behind the human population growth (FAO, 2011).

Livestock systems represent a potential pathway out of poverty for many smallholders in the developing world like Ethiopia. The majority of the world's rural poor and a significant proportion of the urban poor keep livestock and use them in a variety of ways that extend far beyond income generation. In many cases, livestock are a central component of smallholder risk management strategies (Solomon, 2007). The economic contribution of the livestock sub-sector in Ethiopia is also about 12% of the total and 33% of agricultural GDP and provides livelihood for 65% of the population (Asfaw and Mohammad, 2007).

Many Ethiopians, like other developing countries, do not consume adequate amount of meat. The few that do, however, maintain a meat diet of beef, sheep, goat and poultry. In 2001, 51% beef, 19% sheep, 14% goat and 15% poultry contributed to a meat diet composition. Most Ethiopians do not consume pork, in addition to many types of fishes, due to religious factor (Abbey, 2004).

Formally, Ethiopia had been exporting approximately 200,000 livestock annually (Yacob and Catley, 2010). This is significantly higher than the recent annual official exports of cattle (12,934 head), sheep (13,554 head) and goats (1,247 head) between 1998 and 2003 (Abbey, 2004). In Ethiopia, recent studies estimated that annual illegal flow of livestock through boundaries reaches high. 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. These become barriers to understand and analyses the full range of activities required to bring a product (live animals, meat) to final consumers passing through the different phases of production, marketing, processing and delivery to the consumers. It creates barriers to identify market focused collaboration among different stock holders who produce and market value added products (Workneh, 2006).

The major challenges facing in the meat export abattoirs is lack of competition with their products in the domestic as well as the export markets has been limited by underutilization of their meat processing capacities. The live animal throughput is inadequate and as a result the existing meat processing facilities operate at less than of their operational capacities (NEPADCAADP, 2005). This is apparently due to inadequate supply of the required quality live animals for meat processing by the export abattoirs which makes them less competitive in the global or national meat market. The export abattoirs are competing for

the domestic supply of live cattle with the demand for live cattle for domestic consumption and for formal and informal (cross border) trade. Therefore, the objectives of this study were:-

- To assess beef cattle production system in the Gondar town.
- To assess major challenge of fattening farms in the study area

## **2. Materials and Methods**

### **2.1. Study Area**

The study was conducted in Gondar town starting from November 2015 to April 2016. Gondar town is one of the districts of North Gondar Administrative Zone, Amhara regional state and located at 742 Km northwest of the capital city, Addis Ababa at an elevation of 2200 m.a.s.l. The city has a latitude and longitude of  $12^{\circ}36'N$   $37^{\circ}28'E$  /  $12.6^{\circ}N$   $37.467^{\circ}E$ . Rain fall varies from 880-1172mm. The maximum and minimum temperatures of the area are  $30.7^{\circ}C$  and  $12.3^{\circ}C$  respectively, the average annual temperature of  $19.7^{\circ}C$  and an average annual rainfall of 1180 mm. The area is characterized by two seasons, the wet season from June to September and dry season from October to May. The farming system in the area is mixed type (crop-livestock production) (CSA, 2008).

### **2.2. Study population**

The study populations were 70 intensive beef cattle farms which selected randomly among 140 farms in Gondar town district. The farm contains both sexes of the animal with maximum number 120 animals per farm and minimum of 25 animals per farm.

### **2.3. Sample size determination**

According to north Gondar zone agricultural office; there area total of 140 intensive beef fattening farms in Gondar town in all the 20 peasant associations of the town. Fromtheses (20 PAS of the town)four PAS were selected purposively based on their associability (road side location). In the selected four PAS (in kebele 06, 20, 18 and 16) which was purposively selected, there are about 120 beef cattle fattening farms, from those farms 70 of them were selected as target farm based on random sampling.

**2.4. Study design**

Cross sectional study was conducted from October, 2015 to April, 2016. After selecting the fattening farms and one time visit was made and the required information was collected by structured questioner and direct observation.

**2.4.1. Selection of respondents and data collection**

Data were collected by interviewing the owners in structured questionnaire, and personal observation was made on feed type they provide, feeding, housing, watering, water sources, and availability of water, Frequency of watering, breed and sex of beef animals. Information were collected from 70 respondents using observation, standard questionnaire and data collecting formats was developed by referring different research to collect data on beef cattle production management practices and constraints.

**2.5. Data analysis**

The excel computer software was used to store data. The data collected were analyzed using SPSS Version 17 (Snedecor and Cochran, 1989). Descriptive statistics such as frequency and percentage were used to summarize the collected data regarding beef cattle management practices, feeding, watering, veterinary services provision, and constraints.

**3. Results**

**3.1. Characteristics of respondents**

About 88.6% of beef producers were males and 11.4% of females. Majority of the respondents were in range 18-45 years old (95.5%) and the rest 4.5% were above 45 years old. The analysis for educational status indicated that 34.3% were in primary school, 5.7% illiterate, 41.4% high school and the rest 18.6% were completed College/university education (Table 1).

**Table 1:**Demographic characteristics of respondents.

Variable	Frequency	Proportion (%)
<b>Sex</b>		
Male	62	88.6%
Female	8	11.4%
<b>Age</b>		
Young(18-30)	32	45.7%
Adult(31-45)	35	50%
Old(>45)	3	4.3%
<b>Educational level</b>		
Illiterate	4	5.7%
Primary	24	34.3%
Secondary	29	41.4%
College/University	13	18.6%

**3.2. Feed and feeding practices**

According to the respondents 41.4%, 37.1% and 21.5% farmer use wheatstraw, hay andnugcake respectively as supplementary feed, where as the owner did not use atela(localbrewery by product) as supplementary feed. All of the respondents did not provide feed according to body weight of animals. It was also noted that 12.9% respondents provided same type and amount of feed though out fattening period. But, 87.1% of the respondents

increase amount of concentrate at finishing period. All the respondents provided group feeding. The main feeds used by the respondents were, 48.6% (*Beancoat+guyagelefet+wheatbrane+nugcake*), 30% (*Beancoat+guta b (Mashiladefecha) + straw*), 17.1% (*Beancoat+titcake+ricebrane*) and 4.3% (*Beancoat+peacoat+hay*). Majority of respondents fed twice/day (98.6%) where as 1.4% fed the animals three times/day. The analysis for improving feed quality revealed that no practices of ration formulation as stated in Table2.

**Table 2:** Feeds, feeding system, and season of feed availability.

Variable	Frequency	Proportion (%)
<b>Supplementary feed</b>		
Wheat straw	29	41.4%
Hay	26	37.1%
Atela	---	---
Nugcake+hay	15	21.4%
<b>Feed provision</b>		
Body weight based feeding	---	---
Non body weight based feeding	70	100%
<b>Feeding strategies through fattening period</b>		
Same type and amount of feed	9	12.9%
Not same type and amount of feed	61	87.1%
<b>Way of feed provision</b>		
Commonly	70	100%
Separately	---	---
<b>Main feed they provide</b>		
Bean coat+ guyagelefet +wheat bran +nugcake	34	48.6%
Bean coat+gutab(Mashiladefecha)+straw	21	30%
Bean coat+titcake+ricebrane	12	17.1%
Beancoat+peacoat+hay	3	4.3%
<b>Feeding frequency/day</b>		
Once	---	---
Twice	69	98.6%
Three times	1	1.4%
<b>Scientific feed formulation</b>		
No	70	100%
Yes	---	---

### 3.3. Water sources, watering practices and selection criteria of fattening animals

The major water sources used were 70 and 30%, river and tape water respectively and the time of water provision was morning and afternoon available which were 8.6% and 91.4% respectively. According to respondents' water provided were 35.7%, 4.3% and 60% limited, surplus and plentiful respectively.

According to respondents' majority of farmers were selected cattle for fattening based on body frame and about 30% of the respondents used wide and deep body condition, while 4.3%, 42.9% and 22.9% of them choose thick neck, big and stand hump, good body condition, and glossy coat respectively as stated in Table 3.

**Table 3:** Water sources, watering practices and selection criteria of fattening animals.

Variable	Frequency	Proportion (%)
Source of water		
River	49	70%
Tape water	21	30%
Atela	---	---
Watering time		
Morning	6	8.6%
Afternoon	64	91.4%
Always	---	---
Amount of water provided		
Limited	25	35.7%
Surplus	3	4.3%
Plenty full	42	60%
Selection criteria		
Wide and deep body condition	21	30%
Thick neck	3	4.3%
Big and stand hump	30	42.9%
Good body and glossy coat	16	22.9%

### 3. 4. Beef cattle housing practices

According to respondents, 48.6% of the beef cattle owners had shortage of land for fattening as house/barn/grazing and whereas the rest 51.4% had no land problem. Majority of the fattener build stall for their cattle for different reasons these were, scarcity of land, to create warm condition, for close supervision

and theft problem 14.3%, 50%, 17.1%, and 18.6% respectively. All respondents (100%) construct open air stall and some respondents (62.9%) were not advised by professionals and (37.1%) advised to select site for fattening. 77.1% of the farmers had manure disposal facilities and 22.9% did not have facilities. Above 84.3% of the respondents replied that the farm had no effect on hygiene of town as shown in Table 4.

**Table 4:**Beef cattle housing practices.

Variables	Frequency	Proportion (%)
Shortage of land		
No	36	51.4%
Yes	34	48.6%
Reason for building stall		
Land scarcity	10	14.3%
To create warm condition	35	50%
For close supervision	12	17.1%
Theft problem	13	18.6%
Professional support for site selection		
No	44	62.9%
Yes	26	37.1%
Manure disposal facility		
No	16	22.9%
Yes	54	77.1%
Farm affect to the urban		
No	59	84.3%
Yes	11	15.7%

**3.5. Beef cattle management, practices and its marketing system**

The majority of cattle’s entered in fattening in Gondar town district were adults which were about 82.9% and 17.1% were both old and adult animals. The Analysis for fattening period indicated that 40%, 38.6% and 21.4% of respondents keep animals for two, three and above three months respectively. Majority of the respondents (52.9%) used both sexes, where as 47.1% of respondents used male animals only. Further, 74.3% used both local and cross breed where as 25.7% used only local breed. Some respondents used 55.7% and

44.3%, on foot and vehicle transport to and from the market respectively. All respondents used intensive way of feeding system. Some respondents (57.1%) had market access, while 42.9% had no market access. All respondents used local market to sell the finished animals. The sources of cattle’s to be fattened were only purchased. All the respondents replied that the cost of fattened animals were high and attractive during holy days, due to maximum consumption of meat. The respondents purchased 80% and 20% moderate and thin cattle for fattening respectively as described in Table 5.

**Table 5: Beef cattle management practices**

Variables	Frequency	Proportion (%)
Age of cattle		
<b>Adult only</b>	58	82.9%
<b>Adult and old</b>	12	17.1%
Length of fattening period		
<b>Two month</b>	28	40%
<b>Three month</b>	27	38.6%
<b>&gt;three month</b>	15	21.4%
Sex of animal		
<b>Male only</b>	33	47.1%
<b>Both</b>	37	52.9%
Breed used for fattening		
<b>Local only</b>	18	25.7%
<b>Both</b>	52	74.3%
Transportation method		
<b>On foot</b>	39	55.7%
<b>Vehicle</b>	31	44.3%
Market access		
<b>No</b>	30	42.9%
<b>Yes</b>	40	57.1%
Body conditions of cattle to be fattened		
<b>Thin</b>	14	20.0%
<b>Moderate</b>	56	80.0%

**3.6. Major constraints of beef cattle production and veterinary services**

The main constraints of beef cattle production in Gondar town as prioritized by respondents were 8.6%,

50.0%, 5.7%, 14.3 and 21.4% showed that local feed shortage, high cost of commercial feed, shortage of land, disease and lack of credit respectively. The main veterinary services provided in this area were treatment only as shown in Table 6.

Table 6: Constraints of feedlot cattle production and veterinary service.

Variable	Frequency	Proportion(%)
Constraints		
Feed shortage	6	8.6
Feed cost increase	35	50.0
Land shortage	4	5.7
disease	10	14.3
Lack of credit	15	21.4

#### 4. Discussion

The majority of fatteners under current investigation were found to be male 88.6% when compared to their female contemporaries 11.4%. This finding was in agreement with (Seid, 2012) who reports 81% and 19% of males and female respectively in Debrezeit. But it disagrees with (Azage, 2004) who reported 67% male and 33% female headed households of livestock keepers in Addis Ababa. 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 and for economic reason and in beef production might indicate that handling of beef cattle during overall management could be difficult for females (Seid, 2012).

Significantly higher educational status was replied in the current finding showed that 5.7%, 34.3%, 41.4%, 18.6% illiterate, primary school, secondary and college/university level respectively. Which is disagree with the finding of (Belay et al 2012) in Dandi district of Oromia region, Ethiopia, (illiterate 42.3%, primary 43.6%, secondary 3.8%, college/University 10.3%) and which also disagree with (BPDBB, 2007) that reported 70.7% of the sampled household heads are illiterates, only 28.3% of them enrolled in primary schools, 2.7% attend secondary school and only 1.4% join above secondary school. The possible reason might be being have more literate people is due to opportunity of education in study area have more primary and secondary schools and institutes accessibility, so people are not required to travel long distances.

In this study all respondents fed their animals not based on body weight, they fed in common feed trough and disagree with scientifically recommended way of feeding, which was individual feeding system, considering body weight and had several advantages such as monitoring body weight, available feed on production basis and minimize feed wastage. Animal cannot expect at its greatest potential unless properly feed (Solomon, 2004).

The result of this study indicated that majority of the farm owners feed their animals about twice (98.6%) and three times/day (1.4%). This finding was disagree with (Edward, 1996) that reported for better output feeding animals in short intervals/high frequency as scientifically recommended.

In the study area the owners fatten animals using bean coat, guayagelefet, wheat bran, gutab (mashiladefecha) and rice bran which they purchased from local market and mixed with wheat and barley straw by hand until it becomes wet and soft enough for animal consumption. Generally crop residues, nugcake, titcake and hay feeds contribute a major proportion to dry matter intake, metabolic energy and protein of livestock diets (Table, 2). This finding disagree with (Adugna, 2008) who reported that backyard fattening in ArsiNegelle area was based on areqeatella (aresidue resulting from home distilling of an alcoholic liquor, areqe) and wheat straw supplemented with a small amount of wheat bran and in line with (Addisu et al., 2012) that reported Wheat straw is the main component in the diet of animals in ArsiNegelle.

The finding, consistent with (FAO, 2011) that reported selection of fattening cattle for desirable size, conformation and body condition rely upon visual assessment (Auriol, 1974). This study also consistent with (Takele *et al.*, 2009) and (BoARD, 2004) fatteners in wolayita and northern part of Ethiopia select tall height, big and stand hump, good body condition, and glossy coat cattle.

The present study show that fatteners used open air stall for fattening of animals and agrees with (Marion, 2000) Stalled-fed cattle's are kept in confinement for the entire finishing period. The stall is constructed as a compartment of farmer house (Marion, 2000) from locally available materials and a comparable type of housing system. Farmers reported that open air stall is constructed to provide comfortable condition for finishing animal and routine husbandry practices and a comparable reason was reported by (Tesfaye *et al.*, 2005).

Regarding fattening period was in agreement with the report by (Wardle, 1979) who reported 3 to 6 months and disagreed with (UNDP, 2003) that extended to 8 month. The present findings find similarities with (Takele *et al.*,2009) who reported that cattle feeders fed cattle usually for four months in welaita area southern Ethiopia and Bahrdar area of north Ethiopia. This findings were consistent to cattle fattened throughout the year with a peak during dry season in Malawi (Agymanget *al.*,1988).

In current findings 25.7% of the fatteners used only local breed cattle to fatten and 74.3% used both local and cross breeds. Animal managers must have a general knowledge about feed stuffs and the nutrient needs of animals to begin ration formulation (Barrick, 1988). The current study shows that 44.3% of owners transport the fattening animals with vehicle and the remaining 55.7% was transported on foot. This finding was disagreeing with (Yacob, 2002), 100% of the respondents trek their cattle to the near terminal market of Moyale. The reason might be due to availability of transport facility in the study area.

Majority (80%) of the fatteners selected moderate body condition so can be fattened in short period, this in line with (Long, 1998) that reported selecting animal is essential for production and marketing that is both profitable to producer and desirable for consumer so that proper selection is the first step, but excellent feeding and will not compensate for undesirable in animals.

In current finding all fatteners purchased cattle for fattening purpose but disagree with (Tsfaye, 2007) that reported farmers in Chewaka district fattened cattle using animals from their own herd since most fatteners in Gondar district were urban society. The present study was agreed with the reported by (Ebrahimet *al.*,2004) that finished cattle are sold at attractive price due to maximum consumption of beef during main holidays. This study was in agreement with (Belete *et al.*,2010) reported that shortage of capital and credit was the first constraint in cattle fattening in Amhara region. Credit provision was crucial problem in the region. The small stakeholder not to borrow money until they organized (Azage *et al.*,2006). Land shortage was replied from the respondents in the present study area which were in line with reported by (Million, 2003) that the central southern region was highly populated therefore intensification is probably better for this area, since there is no possibility further land expansion.

## 5. Conclusion and Recommendations

The study showed that all respondents did not feed their animals based on body weight and fattened without any practice of scientific ration formulation. The result indicated that main constraints of beef cattle production were feed cost increase and lack of capital and credit Which Ranked 1<sup>st</sup>and2<sup>nd</sup> respectively.

All beef cattle producers used local market for selling the finished animals on holidays. Thus, it is important to follow scientific feeding, look for alternative feed resources and fulfill feedlot facilities so as to enhance the economic contribution of beef sector in the study area. Based on the above conclusions, the following recommendations were forwarded:-

- The government must provide credit and facilitate the performance of fatteners by training them through micro organization.
- Training should provide for fatteners on scientific ration formulation.
- Government should facilitate non seasonal marketing for fatteners by granting exporting animals to abroad.
- The fattener should feed the animals based on body weight of the animals to hasten finishing time.
- Further research and development work should be encouraged to alleviate feed cost increment through different options such as utilization of local by product.

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