



Beef Cattle Fattening Practices, Constraints and Opportunities in Ethiopia

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Abstract

Beef cattle fattening is one of the newly incipient activity. It is a common practice in Ethiopia and special attention was given by the government to boost red meat supply through cattle fattening. In addition to its important, little is known about its fattening practices, constraints and opportunities in various parts of Ethiopia. Therefore the aim of this paper was to review beef cattle fattening practice, constraints and opportunities in Ethiopia. Cattle fattening is an increasing business at different scales in Ethiopia. Traditional fattening system, Hararghe fattening and by product based fattening system are the three common types of beef cattle fattening system in Ethiopia. Farm gate, purchased, own herd, local market and local farmers are the major source of animals for fattening in Ethiopia. River, Tap water, Pond, Rain fall, Well water, spring and piped are the key water sources for beef cattle fattening. However watering frequency is typically depends on feed type, temperature of the environment, age of the animal and usage of the animal for different purposes. Smallholder and commercial producers in the country used multiple selection criteria for fattening of cattle, which includes breed type, physical appearance, castration, sex, age, health and initial price, body condition, coat color and horn size as the major ones. The duration of fattening period varies according to the type of agro-ecology, breed, feeding type, age of animals, sex. Diseases, shortages of feed and water, lack of veterinary services, droughts, market problem and infrastructure, health problems, lack of capital, feed price increment, land Scarcity and genetic factor are among the constraints that hamper efficient beef fattening in the country. However, the major opportunities that enhance beef cattle fattening were demand of meat by consumers, the availability of customers, weather condition, and better housing system, society to be part of the sector, irrigation practices, and breed availability, indigenous beef cattle fattening knowledge and managements, cultural medication of fattening cattle. Therefore it can be concluded that to improve and motivate beef cattle fattening in the country, the constraints must be solved through focusing on credit provision, strategic disease control, solve feed shortage, market problem and infrastructure, health problems, lack of capital, feed price increment, land Scarcity and genetic improvement.

Keywords: Beef cattle; Constraints; Fattening; Ethiopia; Opportunities

Introduction

Livestock are a key resource for economic growth in many countries, both at national and household level. Animals are important assets and an essential source of income for livestock-keeping households. Moreover, livestock can also significantly influence the livelihoods of other households that do not have livestock, as well as supplying inputs for crop production such as fertilizer or animal traction [1]. Livestock are critical to incomes, livelihoods, nutrition, food security and resilience in much of East Africa. Across the region, the increasing demand for livestock products has not yet been matched by a growth in production, implying that there are potential widespread benefits for both producers and consumers if the former can respond to this rising demand [2].

Ethiopia is believed to have the largest livestock population in Africa. This livestock sector has been contributing significant portion to the economy of the country. It is important that livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter supply etc. provide the needed animal protein that contributes to the improvement of the nutritional status of the people (2021/2022). The cattle population in Ethiopia was estimated to be 70 million among which 68 million were Indigenous cattle, 1 million exotic breed and 1 million were cross breeds [3].

Ethiopia's commercial red meat (beef, mutton and goat) industry has made remarkable progress to date and shows considerable growth potential for the future. Cattle fattening is one of the newly incipient activity. Its sector is an emerging for employment and income generation for urban and pre-urban dweller, particularly, for those vacant farmers

due to urbanization and cattle fattening association organized at small scale micro finance level. Cattle fattening is an effective tool for poverty alleviation and become an important business sector simultaneously, attention need to be focused on small holder cattle fatteners as well as private sector as engines of economic vitality. Beef cattle fattening is a common practice in Ethiopia and special attention was given by the government to boost red meat supply through cattle fattening. In Ethiopia governmental and non-governmental organizations currently encourage the emerging small scale as well as commercial fattening farms and support establishments of the sector either in cooperative or private form.

Generally there are three different types of beef cattle fattening system in Ethiopia. Those are traditional methods, Hararghe fattening and by product based fattening system. Each of the systems had their own characteristics and had positive and negative impacts. Accordingly, cattle fattening is an increasing business at different scales in Ethiopia. Various research activities in cattle fattening practice have been conducted over the years to fill the production gaps, identify the

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challenges and opportunities of cattle fattening and support needs of the sector.

Beef cattle are one of a few agricultural commodities in Ethiopia from which the country earn foreign currency through both live and processed forms of the commodity export and also most of rural poor are engaged in rearing it to fulfill their daily needs and economic gaps. However, there are key constraints to beef cattle fattening practice in Ethiopia, feed shortage, diseases, lack of extension service, lack of enough credit, inadequate market places, Inadequate health service, Lack of improved breeds, good condition animals, lack of holding places, Lack of road for transportation, shortage of stock supply for fattening/reproduction, lack of market information [4-6].

In Ethiopia, there is limited information about beef cattle fattening practices, their constraints and opportunities and also particularly, the constraints and opportunities faced were not properly review despite the encouragement of the sector by government. Therefore, the goal of this review was to provide and make scientifically validated and up-to-date information on beef cattle fattening practice, constraints and opportunities in Ethiopia with the following specific objectives:

- To review the existing beef cattle fattening practices in different parts of Ethiopia
- To review the constraints and opportunities of cattle fattening practices in Ethiopia
- To review beef cattle selection criteria, duration of fattening, source of watering and frequency watering beef cattle in Ethiopia

Literature Review

Beef cattle fattening system and sources of animal for fattening in Ethiopia

According to MOA (1996) cattle fattening practices in Ethiopia is classified in to three chief fattening systems: those are traditional system, by product-based system and Hararghe fattening system. In traditional system, farmers usually sell oxen after the plowing season when they are in poor body condition and too old for the draught

purposes. By-product fattening system is mainly based on agro-industrial by-product such as molasses, cereal milling by-product and oilseed meals and others. Intensive feeding of the available feed supply to young oxen used for draught power could best describe the Hararghe fattening practice. The Hararghe fattening system is characterized by the use of the available feed resources to young oxen through cut-and-carry feeding system of individual tethered animals [7].

According to Addisu S, et al. [8] reported in Saylem Woreda, south west Ethiopia, Traditional and modern are the main beef fattening systems. In Lume district, East Shewa Zone, Traditional, Semi-intensive and Intensive were the major cattle fattening system [9]. The study of Mohammed Y, et al. [6] indicated that, in Kellem Wollega Zone, Traditional, by product based and Intensive were the main of beef cattle fattening system. According to the study of Habtamu Ayalew, et al. [10] in Gondar Town all respondents were used by products based fattening system in which the major feed resources for cattle fattening were agricultural industrial by products. There are various cattle fattening practices conducted in different parts of Ethiopia based on the source of animals, age, breed and sex/type (Table 1).

Water source and watering frequency

According to Eyayu G, et al. [11] stated that in Gamo Zone, pond, river, spring and piped water were main source of water for fattening. [12] Has reported the main source of water for cattle are river, pond and pipe line. In Kellem Wollega Zone Western Oromia, river, tap water and ponds are major water sources for beef cattle fattening [6]. However, wells, pond and lakes are the main water sources in Harsh in Somali [13]. According to Habtamu Ayalew, et al. [10] reported that water sources of cattle fatteners in Gonder town were river and tape water. Similarly in Bure woreda revealed that river, spring, and hand dug well were the three types of identified water sources [14]. The major type of water resource for the fattening animal in urban and peri-urban areas of Dangila town of Awi zone was hand well, water pipe and spring water. According to Nigussie G, et al. [15] the source of water in Arsi Negelle District of western Arsi zone was river, tap water and Atela. Recent study by Addisu S, et al. [8] stated that mechanically assisted

Table 1: Cattle fattening practices conducted based on the source of animals, age, breed and sex/type.

Source of animals for fattening	Variables		Location/Regions	References/sources
	Sex	Age		
From own herd Purchased Both	Male	Medium and old	Wollega, Oromia	Mohammed Yousuf et al., [6]
Farm gate	Majority male and less female	Mature and old	North Gondar, Amhara	Mekuria et al., [26]
Farm gate	-	Young, mature and old	Wolaita, Sothern	Wabalo et al.,
Own herd Immediate purchase Provided through livestock office	Male and female	Old oxen, Matured cow, Young bull	East Shewa, Oromia	Tesfaye Moreda et al.,
Farm gate and from market	Culled oxen (castrated)	Culled oxen	East Gojjam, Amhara	Belay et al., [28]
Local farmers Brokers	Male	Medium (3-4 years) Old (over 4 years)	Mekelle, Tigray	Teklehaymanot et al., [19]
Local market and farm gate	Old and matured oxen, young bull and culled cow	Majority of castrated male and less non-castrated	Gamo Gofa, Southern	Guyo et al., [25]
Farm gate and Purchased from local producers	Oxen, old cow and Bull	Old	Wollega, Oromia	Beyene et al.,
Farm gate Primary market Secondary market	old and unproductive oxen	Bull and steer (male)	Harshin, Somali	Fikru et al., [12]
Farm gate	Majority male and less female	Mature and much older animals	Central, Southern	Wolde <i>et al.</i> ,
Home born Purchased	Male and female	Calf, adult and Old	Arsi Negelle, Oromia	Nigussie Gizachew <i>et al.</i> , [5]
Purchased From own herd	-	-	Ilu Aba Bora, Oromia	Teshager Ayalew <i>et al.</i> , [11]

and rivers were the main source of water for cattle fattener in Saylem woreda, south west Ethiopia. Similar findings by Tesfaye Tm, et al. [9] in Lume district of East Shoa Zone, river, Tap water, pond, well water is identified water source for cattle fattening. According to Lijalem T, et al. [16] reported that river, pond, rain fall, well, tape water were the source of water for beef cattle fattening in Hadya Zone, Southern Ethiopia.

Water requirement typically depends on feed type, temperature of the environment, age of the animal and usage of the animal for different purposes [12,17,18] households provide water to their animals once a day, twice a day and ad libitum. Similar study in Hadya Zone, Southern Ethiopia by [16] stated that farmers provide waters to their animals once a day, twice day and ad libitum. According to Amistu K, et al. [19] reported from Hadiya zone, Southern Ethiopia, farmers in the highland area watered their beef animal's ones a day; this was due to the fact that, there was wet air condition and whereas in the low land area they watered their beef cattle twice a day at morning and afternoon. Similar study in Lume district of East Shoa Zone by Tesfaye show that water frequency for cattle fattening were any time required, once a day, twice a day, this is based on season. Watering frequency, in Harshin District of Somali Regional State, fattener offered drinking water for their fattening cattle once and twice times per day. This may be due to the fact that most of the time cattle fattening activity were done during the time when the majority of their feed was derived from seasonally available green feed and thus the fattening cattle could fulfill their water requirement from the feed [13].

Dessalegn G, et al. [20] also reported similar result in Bench-Maji Zone; Southwest Ethiopia farmers had used rivers, springs, borehole water and dam/pond and rain water as main sources of water for their cattle during the dry and wet season. Teshager et al., [12] had reported similar result from Ilu Abs Bora Zone of Oromia Regional State, South Western Ethiopia; the main sources of water for cattle are river, pond, and pipe line. According to Habtam, et al. [4] reported that in Gondar town householder give water for their cattle when they need.

Housing system of fattening cattle

House is vital to shield each individual and animals from predators, robbery and from exclusive climate conditions. It is mostly crucial to protect animals from adverse weather condition heft and predators.

Regarding the housing managements of animals used for fattening purpose the farmers keep their animals in fattening houses with complete roof and wall, whereas the rest of them use fattening houses with no roof and complete wall, but fenced using locally available materials, like thorny plants and others Teklehaymanot et al. [21]. There are various types of houses which had been used to keep the fattening cattle in different parts of Ethiopia (Table 2).

Selection criteria and duration of cattle fattening practice

Different criteria have been used for purchasing of cattle to be fattened in different parts of Ethiopia. Smallholder and commercial producers in the country used multiple selection criteria for fattening of cattle, which includes breed type, physical appearance (frame size), age, health and initial price, body condition, coat color and horn size as the major ones (Table 3).

Duration of cattle fattening

The length of fattening period varies according to the type of agro-ecology, breed, feeding type, age of animals, sex. Fattening length in highland regions was higher than those of midland regions. The long duration in the highland regions is due to slow body weight gain of fattening animals as a result of low feed offered because of less availability of feed and effect of cold environmental temperature [22]. Also the fact that animals in cold climate may be forced to utilize parts of the energy obtained from absorbed nutrients to cope up with cold weather rather than for body weight gain. Duration of 3 to 4 months of fattening length is also reported in commercial beef fattening farms [23] According to Yihunie M, et al. [24] reported that fattening lengths were not different between Sub-Kola and weina-dega agroecologies. This may be due to the use of similar type of basal feed resources and supplements. From the fattening lengths, 3 months and 3.5 months are optimum. Amare et al., [25] fattening period Gamo Gofa was 3 to 4 months because there was high demand on meat of cattle so farmers fatten their cattle in short period of time. The fattening duration reported by Wolde et al. the average fattening duration of oxen in Woliata Zone was 3.6 months. But Ayalew et al., [4] reported cattle fattening duration of 4-9, 10-15 and more than 16 from different agro ecologies of Iluaba Bora Zone, Oromia region.

The duration of cattle fattening vary depending on the quality and availability of feed, management system, breed type, body condition

Table 2: Types of houses which had been used to keep the fattening cattle.

Housing system	Region/Location	References/source
Separate room Separate house Enclosed barn with shed	Gamo Zone, Southern Ethiopia Bure Woreda, Amhara	Eyayu et al., [17]
Open house Semi close house Close house	Kellam wellega, Oromia	Mohamme et al., [6]
Tie stall house Compost barn Free stall barn	Gamo Gofa, Southern	Amare Migibe et al., [23]
Enclosure or kraal With roof and complete wall	Mekelle, Tigray	Teklehaymanot et al., [19]
In living room with the family Home stead shed Barn	Harshin, Somali	Sisay Fikru et al., [12]
Main house with the family Adjacent house Separately constructed house Open temporary corral	Lume district, East Shewa Zone, Oromia	Tesfaye et al.,
Open air Confined with shade	Arsi Negelle, Oromia	Nigussie Gizachew et al., [5]

Table 3: Multiple selection criteria for fattening of cattle.

Selection Criteria	Location	Source
Body size, Age, Color, Health, Price, Breed	Gamo Gofa, southern region	Eyayu et al., [24]
Height, Body condition, color, Sex, Castration, Age, Color, Breed,	Sidama, southern region	Agegnehu et al.,
Breed, Frame/width size, Horn size Age/teeth eruption, initial price, Body conformation, Length, Health, color Adaptation	West Hararghe, Oromia East Shewa, Oromia	Adunea et al.,
Breed, Coat color, Castration	Gondar, Amhara	Birhan et al.,
Health condition, physical, age, sex appearance and color	Hadiya, Southern Region	Amistu et al., [17]
Type of animal, sex, age, Price, Horn productivity, Body size/frame; Health; Body condition; Color; Adaptation	West Gojjam, Amhara	Mengiste Yihuni et al., [22]
Wide and deep body, Thick neck, Glossy coat, Big and stand hump Good body condition	Arsi Negelle, Oromia	Nigussie et al.,
Good body condition Age, Sex, breed, body size	Mekele, Tigray	Teklehaymanot Gebremichael et al., [19]

Table 4: Constraints of beef cattle fattening practice in Ethiopia.

Constraints	Location	Source
Feed cost increment and lack of credit Lack of governmental feed processing factories Absence of market information etc.	Gondar, Amhara,	Habtamu Ayalew et al., [4]
Diseases and Lack of grazing lands Unavailability of veterinary service Lack of road for transportation	Harshin, Somali	Sisay Fikru et al., [12]
Recurrent drought and feed shortage Feed price increment Inadequate practical training support	Kombolcha, Amhara	Kassahun Ahmed et al.,
Shortage of feed resource Inadequate health service Lack of improved breeds etc.	Eastern, Oromia	Amare Migibe et al.,
Shortage of feed and lack of grazing land Poor veterinary service and Low level of technology Poor extension service	Gamo Gofa, SNNP	Gebremichael et al., [23]
Health problems Feed and water, improved breed	Saylem, south west Ethiopia	Solomon Addisu et al., [8]
Disease Shortage of land Lack of credit and capital	Arsi Negelle, Oromia	Nigussie Gizachew et al., [5]
Feed shortage Lack of feed resources and capital Lack of capital	Jabitehnan, Amhara	Mengiste Yihunie et al., [23]
Disease Feed Shortage and Feed Cost Land Scarcity and Genetic Factor	Kellem Wollega, Oromia	Mohammed Yousuf et al., [6]
Feed shortage Market	West Hararghe, Oromia	Bezahegn Abebe et al., [4]
Feed shortage and Water shortage Shortage of land and Feed cost Disease and parasite	Gamo, Southern	Eyayu Gobezie et al., [10]
Shortage of feed and shortage of land Market problem	Mekelle, Tigray	Gebremichael et al., [20]

as well as seasonal fluctuations of market demand due to religious and other holidays in the year. Guyo DA, et al. [25] indicated that body condition of the animals was the most common criteria used to decide the length of fattening period and it took 3, 5 and 6 months in the mid altitude, lowland and highland agro-ecologies, respectively.

According to the study conducted by Beyene and Fufi in Guduru and Hababo Guduru districts of Oromia region, the majority of the duration of fattening were 3 – 4 months (September – December) while, 5 – 6 months (December – May) were less in percentage. The study of Wabalo and Anja in Damot Pullassa district, Southern region showed that the length of fattening period 6 month accounted for 20 %. The variation of fattening period and cycle in the year were associated

with the availability of feed, supplements used, climate situation, and market demand and body condition of the animals at the initial stage before starting the fattening business. Teshager et al., [11] in Ilu Aba Bora Zone, Oromia region showed that cattle were fattened for duration of 4 – 9 months, 10 – 15 months and > 16 months.

According to Agegnehu et al., [26] reported that the majority of the farmers in the Hwassa, southern Ethiopia takes 4-5 months for fattening and the rest for 3-4 months. This short duration of fattening was associated with types and aim of production and agro- ecology. However, the length of fattening period varies according to the feed availability and market demand.

Constraints of beef cattle fattening practice in Ethiopia

Several constraints were known by diverse researchers in the country as shown in (Table 4). Shortage of feed, feed price increment, Diseases, Lack of grazing lands initial capital for fattening investment, animal health and marketing problems were the major issues analyzed by the author based on the findings of the researchers.

This review was similar to report in an earlier study by Gobena [27] who stated that feed shortage, diseases and parasites, drought and shortage of grazing land were the major constraints challenging cattle farmers in Ethiopia. Similar findings by Belay and Negesse [28] in Burie Zuria District, North Western Ethiopia feed, limited knowledge and poor genetic potential of cattle were the major challenges for cattle fattening in Ethiopia. According to Matawork Milkias [29] reported that the major constraints for cattle production in Ethiopian farmers were feed shortage, diseases and parasites, drought, shortage of grazing land, market access, veterinary services, extension services and other infrastructure. Among those constraints inadequate supply of quality feed, drought, diseases and parasites were the main reasons for low productivity of the indigenous cattle breeds and are the major factors limiting cattle productivity in Ethiopia. Similar funding by Ahmed et al., [30] show that recurrent drought and feed shortage, feed price increment, unsuitability of the environment, Illegal brokers, inaccessibility of cattle market, credit based market ("dube") were the major identified constraints in per urban cattle fattening practices in Urban and Peri-Urban Kebeles of Dessie town, Ethiopia. In Hawassa, Southern Ethiopia, land shortage, feed shortage and poor quality, lack of initial capital and governmental support, disease outbreak and inadequate veterinary services were the main constraints of Beef Cattle production [26].

Opportunity of beef cattle fattening practice in Ethiopia

Eyayu Gobezie et al., [10] funding show that the major opportunities that enhance beef cattle fattening in Gamo Zone, Southern Ethiopia were demand of meat by consumers, the availability of customers, income growth, availability of trained manpower and weather condition. Better housing system, absence of endemic health problem of fattening cattle, increase demand for meat, presence of federal as well as regional government great emphasis, motives and interest of the educated society to be part of the sector, availability of infrastructure such as road and electric access were the identified opportunities related to cattle fattening practices in Dessie town [29]. The irrigation practices carried out by smallholders in Jabitehnan district, Amhara could minimize livestock feed shortage and increasing pasture and crop residue availability during the dry season [30].

According to Agegnehu Mekuria et al., [26] funding, Demand, Market access, urbanization and Breed availability were main opportunities of Beef Cattle production systems in Hawassa, Southern Ethiopia. Similar study by Dinku A reported that cattle marketing towns near the main rode to local capital city, indigenous beef cattle fattening knowledge and managements, cultural medication of fattening cattle, copying and better adoption tradition from model cattle fatteners are the available opportunities currently in cattle fattening business. High demand of animals by the local abattoirs, Official exports, and Domestic Consumption were Opportunities beef cattle production in Ethiopia

Conclusion

Beef cattle fattening is a common practice in Ethiopia and special attention was given by the government to boost red meat supply

through cattle fattening. Cattle fattening is an increasing business at different scales in Ethiopia. There are various fattening system, source of animals for fattening, water sources selection criteria for fattening of cattle. The duration of fattening period varies according to the type of agro-ecology, breed, feeding type, age of animals, sex. Diseases, shortages of feed and water, lack of veterinary services, droughts, market problem and infrastructure, health problems, lack of capital, feed price increment, land Scarcity and genetic factor are among the constraints that hamper efficient beef fattening in the country. However, the major opportunities that enhance beef cattle fattening were demand of meat by consumers, the availability of customers, weather condition, and better housing system, society to be part of the sector, irrigation practices, and breed availability, indigenous beef cattle fattening knowledge and managements, cultural medication of fattening cattle.

Based on above conclusive statements, the following recommendations are forwarded by authors:-

- There should be the mechanism of adaptation and introduction of improved feeds and feeding systems should also be implemented.
- The government should design appropriate infrastructure and develop veterinary service
- Short training on beef cattle fattening should be given to the farmers for advanced implementation.
- Modern cattle fattening practices, findings, research output must be gathered from different experienced areas and delivered to the cattle fatteners.

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