ADDIS ABABA UNIVERSITY

COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE

ASSESEMENT OF SMALLHOLDER CATTLE FATTENING PRACTICES AND MARKETING SYSTEMS OF FATTENED CATTLE IN ARBA MINCH ZURIA WOREDA OF SOUTHERN NATIONS NATIONALITIES AND PEOPLE REGIONAL STATE

BY

ASMAMAW ZAFU TADESSE

JUNE, 2012

DEBRE ZEIT, ETHIOPIA

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Tropical Animal Production and Health

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ASMAMAW ZAFU TADESSE

Board of External Examiners **Signature**

1. Dr.Alemu Yami _____
2. Dr. kelay Belihu _____
3. Prof.Tesfu Kassa _____

Academic Advisor

Ashenafi Mengistu (BSc, MSc, PhD) _____

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ABBREVIATIONS

%	Percentage
ANOVA	Analysis of Variance
ATVET	Agricultural Technical Vocational Educational Training College
AZWARDO	Arba Minch Zuria Woreda Agriculture and Rural Development Office
CACC	Central Agricultural Census Commission
CBPP	Contagious Bovine Pluro Pneumonia
CSA	Central Statistical Agency of Ethiopia
DAs	Development Agents
ESAP	Ethiopian Society of Animal Production
FAO	Food and Agriculture Organization of the United Nation
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
ha	Hectare
HH	Household
IBC	Institute of Biodiversity Conservation
ILRI	International Livestock Research Institute
km	Kilo meter
LMA	Livestock Marketing Authority
MOA	Ministry of Agriculture
MOTI	Ministry of Trade and Industry
NEPAD-CAAD	New Partnership for Africa Development-Comprehensive Africa Agriculture Development
RMA	Rapid Market Appraisal
SDDP	Smallholder Dairy Development Project
SE	Standard Error

SPSS	Statistical Package for Social Science
US$	United State Dollar
X^2	Chi square

ABSTRACT

The study was conducted in Arba Minch Zuria woreda of Southern Nations Nationalities and Peoples Regional State with the Objectives of assessing cattle fattening practices, marketing systems of fattened cattle and constraints and opportunities of cattle fattening in the woreda. A total of 100 cattle fattener households were randomly selected using purposive simple random sampling method. Major feed resources used by the fatteners were fresh cut green forage (38%) followed by natural grazing, crop residue and hay with 29%, 21% and 12% respectively. From the sampled farmers 41.8% used feed supplement, while 58.2% of did not use feed supplements. River (46%), pond (27%), and hand dug wells (27%) were the major sources of water in the area. In the study area fattening cattle were tethered either on the farmland or in fences near the homestead during the day. Most farmers house their fattening cattle during the night. Four types of diseases were identified as major health problems of the study area; trypanosomosis (32%), ecto- parasites (23%), blackleg (15%) and internal parasites (14%). In the district, about 57% of the cattle fattening was done starting from early June up to mid September, 29% of the cattle fattening activity was done starting from late September to mid December and the remaining, 14% of cattle fattening was late December to late March. Three different marketing agents participate in the transaction of fattened cattle marketing. These included individual/group of consumers (41%), cattle traders (32%) and local butchers' (27%). Major constraints that hindered the performance of cattle fattening activity were feed shortage, lack of service (extension and input), and disease challenge, market infrastructure and information and lack of genetic improvement in order of importance. Availability of crop residues, high irrigation potential coupled with rainfed cultivation and high market demand were identified as good opportunities which could be used to enhance the performance of cattle fattening activities.

Key words: Arba Minch Zuria woreda, Cattle fattening and Marketing system

1. INTRODUCTION

Agriculture accounts for 45 % of GDP and 85% of export earnings and the sector employs about 85% of Ethiopian population (ESAP, 2006). The livestock sector accounts for about 40% of agricultural GDP and 20% of the total GDP. Ethiopia holds the largest livestock population in Africa estimated at about 50.88 million heads of cattle, 25.98 million sheep, and 21.96 million goats, 0.807 million camels, 42.05 million chicken, 2 million horses 4.72 million donkeys, 0.37 million mules and 4.6 million beehives (CSA, 2010). Besides these numbers the total national livestock production remains amongst the lowest in the world, even by African standards.

According to Solomon (2004), the livestock sector in Ethiopia plays a vital role in the overall development of the country's economy. Yet, the existing income generating capacity of livestock as compared to its immense potentials in the country is not satisfactory. Under these conditions farmers have no incentives to improve the quality of their animals through appropriate management practices. In Ethiopia the current per capita consumption of milk and meat are 16 liters and 13.9 kg/ year respectively; being lower than the African and the world per capita averages, which are 27 litter/year and 100 kg/year respectively (FAO, 2009).

A report by NEPAD-CAADP (2005) indicated that generally East African livestock trade is characterized by illicit (informal) trade between neighboring countries and the inflow stocks are used either for domestic consumption (Kenya and Uganda) or for re-export and domestic consumption (Somalia) or re-export alone (Djibouti). Illicit trade seriously affects Ethiopia. A large number of livestock and livestock products valued at 917 billion birr are annually lost via the flow into the neighboring countries. Data from Livestock Marketing Authority (LMA) (2001) revealed that an estimated 325,800 cattle, 1,150,000 sheep and goats, 300,000 skins and 150,000 hides go through illicit cross-border trade from Ethiopia.

With an annual human population growth rate of 2.4%, Ethiopia's human population will increase to about 149.3 million by the year 2040 (FAO 2005). The rural to urban ratio will also continue to change and is expected to increase in favor of urban population in the coming 25 years. According to the CSA (2008) projection, by the year 2020 the rural and urban distribution of 84.7% and 15.3% will gradually reach 80.1% and 19.9%. Thus, the demand for animal products is expected to increase substantially with the projected growth in human population, rapid urbanization and growth in per capita income. Thus it is possible to improve the benefit gained from livestock in general and from cattle in particular by fattening of plowed oxen, culled cows, and steers resulting from the system which are beyond the requirement for plowing.

Smallholder fattening is an important avenue for income generation mainly for subsistence farmers in the Ethiopian highlands. Fattened animals are a traditional urban consumption item ensuring continued and growing demand. Moreover, growth in meat demand in sub-Saharan Africa is projected to increase over the next 20 years due to expected population and income growth. Beef and mutton consumption are expected to grow in the region of 3.8% to 4% annually between 1993 and 2020 (Delgado *et al.*, 1999). Improving animal conditions through stall-feeding has the potential in much of rural small scale agriculture to generate additional income and employment and thereby improve the welfare of rural populations (FAO, 2004).

Ethiopia is known for its huge cattle population, most of the beef is produced under an extensive low input system and in conjunction with crop and small ruminant production, as a result of which, beef production and productivity are very low as compared to the world average. Beef cattle fattening activity could be one potential source for employment opportunity to alleviate poverty in the country if considerable attention is given for the sub-sector. Farmers can derive substantial income from cattle fattening as well as maximize use of farm resources provided that adequate capital to purchase stocks,

ample knowledge in selecting stocks for fattening, and efficient feeding management using local and available feed resources (MOA, 1997).

In line with the above, Southern Nations Nationalities and Peoples Regional State, in its recent comprehensive plan for agriculture has given particular attention to the promotion of fattening. The comprehensive development plan for crop and livestock is aimed at transforming the subsistence mode of agricultural production system into market oriented production system. The plan views improved livestock and products marketing as an important regional development strategy to increase both rural incomes and foreign exchange. Fattened animal production and marketing has, therefore, been included as one of the intervention areas in the current commodity-based specialization and commercialization plan.

Arba Minch Zuria woreda is suitable for cattle fattening due to market access and presence of three all-weather roads connecting Arba Minch with Wolayta Soddo, Hawassa and Addis Ababa, though detail cattle fattening practices and marketing systems have not been compiled. Despite good fattening potentials associated with market access, little attention is given to livestock development in general and cattle fattening in particular and much has not been studied about fattening practices and marketing systems of cattle in the area. In Southern Nations Nationalities and Peoples Regional State in general and Arba Minch Zuria woreda in particular, there is a newly emerging cattle fattening activity under small scale level by farmers and semi-urban dwellers, which needs deep investigation about the management and its performance. Thus, on the basis of this background, the current study was initiated with the objectives of:

1. Assessing cattle fattening practices at farm level, major constraints and opportunities for cattle fattening in the study area.
2. Assessing marketing systems for fattened cattle.

2. LITERATURE REVIEW

2.1. Economic importance of livestock in Ethiopia

Livestock serve a variety of livelihood, risk management and income-generating functions in the developing world. Where market access is possible, livestock can act as a potential pathway out of poverty for rural producers and other actors throughout the marketing chain, as such access increases the potential scope for sales and makes livestock activities more remunerative (Rich and Perry, 2009).

Livestock have diverse functions for the livelihood of farmers in the mixed crop livestock systems in the high lands of East Africa. Livestock provide food in the form of meat and milk, and non-food items such as draft power, manure and transport services as inputs into food crop production, and fuel for cooking. Livestock are also a source of cash income through sales of the above items, animal hides and skins. Furthermore, they act as a store of wealth and determine social status within the community. Due to this important function, livestock play an important role in improving food security and alleviating poverty (Ehui and Tsigas, 1998).

Livestock are an important source of food, particularity of high quality protein, minerals and vitamins. As a source of income, it is most important cash generating activity for purchase of food, agricultural inputs and other family needs. In the generation of employment, increased production implies higher employment in the production and processing and marketing sector. Livestock as supplier of inputs and services for crop production is worth mentioning where draught power, manure, fuel, weed control and recycling of own secondary products (Getachew and Gashaw, 2001).

Cattle are kept for multipurpose. However, purposes vary with production system. Traction (males) ranked highest, followed by milk (females) and reproduction/breeding

(males and females) in both crop-livestock and agro pastoral systems. Manure production also considered important by most crop/livestock and agro pastoralist farmers, but as secondary rather than a primary purpose. In contrast, reproduction/breeding requirements received higher ranks in pastoralist systems and, for female, requirements for breeding outranked the importance of milk production (Workneh and Rowlands, 2004). Livestock products, especially dairy, can make unique contribution to human nutrition of the poor in developing countries by providing micronutrients in bio-available form such as vitamin A, in addition to carbohydrates, protein and calcium. Thus, dairy producers by making more milk available for human consumption (Ahmed *et al.,* 2003).

In Ethiopia in 1991/93 and 1994, 595 million and 577 million tones of meat, respectively, have been produced. In addition to this due to the export of the 3,790 bovine live cattle in three years (1990-1992) a total value of 1,493 million US $ foreign currency has been gained. In these years the country imported 8 tons of concentrated milk so as to satisfy the milk demand of the population (ILRI, 2000).The value of output from livestock in Ethiopia was estimated at around birr 12 billion in 2000 and accounted for about 45% of the value of all agricultural output excluding the contribution of animal draft power. It is also noted that, at constant prices (1995 US$) value of output from livestock grew nearly by 22% in the two decades between 1980 and 2000, the increase (1.1%) compares well with the growth of the value of agricultural output (FAO, 2003).

2.2. Livestock production system in Ethiopia

The diversity of Ethiopia's topography, climate and cultural conditions make it difficult to generalize about livestock production systems in the country .Numerous authors used different criteria to classify livestock production systems in Ethiopia. However, about five production systems have been identified based on integration of livestock with crop production, level of input and intensity of production, agro-ecology and market orientation. The following systems have been defined viz. pastoral, agro-pastoral, mixed

crop-livestock farming, urban and peri-urban dairy farming and specialized intensive dairy farming systems (Mohammed *et al.*, 2004).

2.2.1. Pastoral production system

In the lowland agro-ecological setup with pastoral production system, livestock do not provide inputs for crop production but are the very backbone of life for their owners, providing all of the consumable saleable outputs and, in addition, representing a living bank account and form of insurance. This system is characterized by sparsely populated pastoral rangelands, where subsistence of the pastoralists is mainly based on livestock and livestock products. The livestock husbandry in this system is dominated by goats, cattle, sheep and camels. Since the main source of food is milk, pastoralists tend to keep large herds to ensure mainly sufficient milk supply and generate income (IBC, 2004).

2.2.2. Agro-pastoral production system

Agro-pastoral form of livestock production system dominates in mid agro-ecological zones where a tendency for crop production has shown besides livestock production. Agro pastoralists are sedentary farmers who grow crops and raise livestock. Livestock are used for draught, savings and milk production. The production system is subsistence type of milk and or meat production (Alemayehu, 2004). Cattle and small stock play a critical role in the agro-pastoralist household economy. Agro-pastoralists tend to retain female stock to produce milk and to maintain the reproductive potential of the herd. Oxen are also important for draft so that stock sold tend to be oxen and cows, which have lost their productive capacity. However, because average herd size is generally low, many herders are increasingly forced to sell young males and even females of optimum reproductive age (ILRI, 1995).

2.2.3. Mixed crop-livestock production system

In the highland livestock production system, animals are part of a mixed subsistence farming complex. Livestock provide inputs (draught power, transport and manure) to other parts of the farm system and generate consumable or saleable outputs (milk, manure, meat, hides and skins, wool, hair and eggs). About 88% of the human population, 70% of cattle and sheep, 30% of goats and 80% of equines are found in this region (Alemayehu, 2004). The principal objective of farmers engaged in mixed farming is to gain complementary benefit from an optimum mixture of crop and livestock farming and spreading income and risks over both crop and livestock production (Lemma and Smit, 2004).

2.2.4. Urban and peri-urban production system

Production systems are developed in areas where the population density is high and agricultural land is shrinking due to urbanization around big cities like Addis Ababa and other regional towns. In this system crossbred animals (ranging from F1 to a higher blood level of exotic breeds mainly Holstein Friesian) are kept in small to medium-sized farms. Urban and peri-urban production systems include commercial to smallholder dairy farms. Such farms are reported to be found in and around major cities including Addis Ababa and other regional towns. This sector own most of the country's improved dairy stock (Tsehay, 2002; Sintayehu *et al.,* 2008). The main source of feed is both own farm produced and purchased hay and the primary objective is to get additional cash income from milk sale (Yitay, 2008).

2.2.5. Specialized intensive dairy farming system

Intensive dairy farming used to be predominated by the state sector and urban and peri-urban private milk production has developed in and around major cities and towns with high demand for milk (Feleke and Geda, 2001). The system comprised of small and

medium sized dairy farms located in the highlands are based on the use of purebred exotic or high grade and crossbred dairy stock. Producers use all or part of their land for fodder production and purchase of concentrate is also another source of feed (Yoseph, 1999).

2.3. Cattle fattening system in Ethiopia

According to MOA (1997), in Ethiopia there are three types of fattening systems.

2.3.1. Traditional fattening system

Cattle are kept mainly for draft power, milk, and manure production and are usually only sold when they are too old for these purposes, or drought or cash shortages force people to sell. Oxen are usually sold after the plowing season when they are in poor condition. Meat yield are low, the beef is poor quality and farmer returns are often inadequate to buy a replacement ox. There is obvious scope to improve this traditional and inefficient system through strategic feeding of good quality forage to fatten animals before they are sold, or to buy and fatten animals sold by others.

In the lowland, where pastoralists do not use cattle for draft and sometimes fattened on natural pasture in good seasons, however much body weight is lost during long distance trekking to Addis Ababa and the animals may reach market in little better condition than culled highland stock. In average or poor seasons, lowland cattle are rarely fattened and often have to be sold in poor condition at low prices. These traditional systems are very inefficient because they do not use the proven opportunity to add weight and condition to cull animals before slaughter. Several improved systems are in use, but none of them is widespread yet.

2.3.2. By-product based fattening system

In 1976 E.C., Ministry of Agriculture (MOA) began to help peasant farmers in Debre-Zeit area to fatten purchased cull oxen using molasses and milling by- products. This has produced profitable results for the individuals involved, and the number of animals fattened has increased every year to about 2,000 per annum .By- product based fattening in Debre Zeit area is feasible because; it is close to the main source of agro-industrial byproducts (molasses, cereal milling byproducts and oilseed meal); grazing land is almost completely unavailable and crop residues are the only significant roughage source; and it is close to the largest and highest priced market for finished beef animal and lies on the major trekking route to that market. By-product based fattening is not recommended for other parts of Ethiopia, except places where oilseed cake is abundant and cheap.

2.3.3. The Hararghe cattle fattening system

Intensive feeding of the available feed supply to young oxen they are using for draught power could best describe the Hararghe fattening practice. The feed types used for the fattening are entirely obtained from crop production especially from maize and sorghum. Substantiated that in Ethiopia the farmers fatten young bullocks at the edge of the fields with lower leaves taken from the stems of sorghum.

Among the most common feed types used for fattening, thinning, leaf strip and part of maize and sorghum plants are major feeds offered to fattening animal during the main and early dry seasons. This tradition is seasonal undertaking to utilize seasonally available feed. During abundant feed supply, the animals are offered in *ad libitum.* Farmers extend animal's daytime feeding up to nighttime and supplement the animal with common salt or locally available mineral licks twice a week. The nighttime feed offering is used to supplement the amount of daytime dry matter consumption and to compensate under supply of feed during daytime as in the case when the farmer is away from his house. During short rainy season, they allow their oxen to graze at the edge of farm plots

or roadsides for 1.5 to 2 hours every morning before sunrise. In the cases where the farmer has more than one ox, he transfers the second one to his relative or person in the same village to feed for him after using for traction (Fekadu and Alemu, 1999).

2.4. Cattle fattening practices

2.4.1. Major feed resource

Livestock in Sub-Saharan Africa are dependent primarily on native grasslands and crop residues (Ibrahim, 1999). According to Alemayehu (2003), Ethiopia's livestock feed resources are mainly natural grazing and browse, crop residues, improved pasture, and agro-industrial byproducts. The feeding systems include communal or private natural grazing and browsing, cut-and-carry feeding, hay and crop residues. Feleke and Geda (2001) reported that grazing and browsing account for nearly 84.8% of the total feed supply from permanent grazing lands, fallow lands and stubble following crop harvest. At present, in the country stock are fed almost entirely on natural pasture and crop residues. Grazing is on permanent grazing areas, fallow land and cropland aftermath (Abule *et al.*, 2007a).

Since concentrate supplements are not readily available and are relatively expensive, they are rarely used in animal production. Instead, on-farm grown forage legumes are suggested as good alternatives (Solomon and Solomon, 1995). However, the various milling byproducts obtained from processing wheat and oil seed meals are of high demand as livestock feed for state farms, city dairy holders, and to a lesser extent for small dairy cooperatives (Alemayehu, 1995). Molasses, obtained from the sugar industry in Ethiopia, is being used mainly by beef producers and to some extent by dairy producers in and around the major cities. Feed constraints result in low milk and meat yields, high mortality of young stock, longer parturition interval and low animal weights (Ibrahim and Ololaku, 2000).

2.4.2. Water resource

Ethiopia is one of the African countries endowed with huge water resources, which include rivers, lakes, reservoirs, small water bodies, swamps and flood plains. These resources are important for livestock resources development. Access to water during the major part of the year is variable and both human and livestock suffer from its shortage. In many parts of the country, animals are trekked to distant watering points once in two or three days. In most instances, the quality of available water is poor and is a major source of parasitic infestation to animals (Zinash *et al.,* 2001).

Ruminates require water to maintain the water content of the body, and water availability affects voluntary feed intake; less water leads to inadequate intake of dry matter. During the dry season water is available only from wells and some lakes and streams (Ibrahim and Olaloku, 2002). This leads to over grazing around watering points. Water intake increases as watering frequency is decreased and feed conversions efficiency becomes lower as watering interval increase (Ibrahim and Olaloku, 2002).

2.4.3. Housing system

The traditional livestock husbandry practiced across the Ethiopian highlands is similar. Livestock are kept in a 'corral' during the night. During the day time, they are herded on communal pasture, private grazing lands or in stubble depending on the season (Getachew *et al.,* 1993). Animal productivity decreases in high stress factor in housing condition. Animal spends a part of their energy to overcome stress. The effect of this factor can be alleviating to design of comfortable barn in planning of animal house (Uzal and Ugurulu, 2008). Design new housing model will be possible by observation of animal's behavior reaction in any area and relation between animal behavior and areas. Change in behavior activity of farm animals are widely used as welfare indicators (Muller and Schrader, 2003). Improved type of housing using barns constructed from locally available and cheap materials is being practiced mainly by urban and peri-urban

small holder dairy farmers owning crossbred dairy cattle. Sheltering cattle, not only protects animals from extreme environmental hazards, but also ease some other husbandry practices.

2.4.4. Major disease

Animal diseases severely compromise Ethiopia's ability to improve food security. A summary of the main diseases, their control, and their implications for trade is in detail described in the recent Livestock Trade Diagnostic Study (MOTI, 2003). The study among others lists the major diseases in its annexes. Many disease problems result from the interaction among the technical and non technical constraints. For example, poorly fed animals develop low disease resistance and fertility problems. When this is coupled with poor animal health care system, the situation worsens (Ibrahim and Olaoku, 2000). Contacts of livestock brought from various localities through the use of communal pasture and watering as well as marketing places play an important role in the transmission of economically significant infectious and parasite disease (Zinash, 2004). The annual mortality of livestock is estimated at 8-10% cattle, 14-16 sheep and 11-13% goats (Feleke and Geda, 2001).

2.5. Cattle marketing system in Ethiopia

Livestock markets in Ethiopia function at three levels consisting of primary, secondary, and terminal markets. Some (Ayele *et al.*, 2003) also include a nominal fourth tier at the farm gate level, which could hardly be considered to function as a market. Yakob (2002), in his description of the types of livestock markets in Ethiopia states that primary markets have been identified as village level markets with a supply of less than 500 heads of cattle/week where primary producers (farmers and pastoralists) sell small number of animals to small traders, other farmers (replacement animals), farmer or pastoralist-traders and in some cases to consumers and local butchers. Such markets are not fenced,

have no scales, and no feeds and watering facilities. Purchasing is done through 'eye ball' negotiations. A good majority of the livestock markets in Ethiopia belong to this group.

Yakob (2002) explains secondary markets to be trader and to some extent butcher dominated markets, with an average volume of 500 - 1000 head per week consisting of finished, breeding and draught stocks and located mainly in regional capitals. Secondary markets serve the local consumers to some extent but mainly feed the terminal markets. These markets also supply live animal exporters and meat processors.

The terminal markets are located in large urban centers such as Addis Ababa, Dire Dawa, Dessie, Baher Dare, Gondar, Nazreth and the coffee growing regions of Sidama and Gideo. Medium to large-scale traders and butchers dominate these markets. Average volume of cattle brought to these markets may exceed over 1000 head/week (Yakob, 2002).

According to Ayele *et al.*, (2003), although live animals make a considerable contribution to the economy in terms of export earnings, a great number of the country's live animals have been traditionally smuggled to neighboring countries. The ban on import by Middle Eastern countries has led to increased illegal sale of livestock through Somalia and Kenya and to a lesser extent through Sudan and Djibouti. Livestock are traditionally flown out of the country from Afar and Somali regions, Borena Zone of Oromia and Omo lowlands bordering Kenya. The neighboring countries bordering these areas either consume locally or re-export to the Middle East countries (Belachew, 2003).

2.6. Major constraints of smallholder cattle fatteners in Ethiopia

2.6.1. Feed shortage

Smallholder farms engaged in livestock fattening face problems with the availability of feeds and fodder; there are problems with both quality and quantity and a lack of economical technology for optimum utilization of local feed resources. Cereal straw is by far the most important crop residue, contributing close to 50% of feed energy available to ruminants (Alemayehu, 2002). However, animals fed on this diet fail to get adequate nutrients for maintenance and production. Moreover, in the absence of full-fledged animal feed production complexes, the existing production levels and prices of various agricultural and industrial byproducts, such as bran, oilseed cake and molasses seem to be prohibitive for the smallholder farmer. Growing ruminant populations compel smallholder producers to practice livelihood strategies inimical to nature, leading to enormous environmental costs for the burgeoning fattening production. Lack of adequate fodder and fuel wood supplies have compelled livestock owners to allow overgrazing on common property resources and forestlands, leading to denudation of common property resources and deforestation of forestlands (Alemayehu, 2002).

2.6.2. Diseases

Animal health care and improve health management is also one of the major constraints of livestock development in Ethiopia and Sub-Saharan Africa in general, which caused poor performance across the production systems. Trypanosomosis is one of the major constraints to livestock productivity, with forty six million cattle at constant risk of infection (Kristjanson *et al.*, 1999). In tsetse infested area of Ethiopia, mostly lowlands, 20-30% of cattle are affected by trypanosomosis and in some high tsetse challenge areas the prevalence of the disease reaches up to 50% (Getachew, 2005). External or ecto-parasites are major problem in Ethiopia (SDDP, 1998). Ticks, flies, fleas and lice infect cattle with dangerous and often fatal diseases.

2.6.3. Market

The structure and performance of livestock and its products marketing both for domestic consumption and export is generally perceived poor in Ethiopia. Inadequate market infrastructure, virtual absence of market information system, absence of market oriented livestock production, inadequate permanent trade routes and other facilities like feeds, water, holding grounds, lack or non provision of transport, inadequate number of exporting firms with low level of capacities, inadequate knowledge of international trade law, level of quarantine facilities and prevalence of various diseases, repeated bans, excessive cross-border illegal trade and stiff competitions, etc are the major challenges that hinder the smooth livestock trade in Ethiopia (Belachew, 2003).

2.6.4. Critical domestic information gap

Livestock Population figures are based on estimates in both the Region as well as the nation. Ethiopia has been using a constant figure for nearly thirty years before allowing annual marginal adjustments in the last 10 years following which the cattle population officially increased by 5 million head (Yakob, 2002). The same sources contend that given the low level livestock-related economic activity in the country, this information gap may not impact the sector in a dramatic way for the time being. However, in the absence of such baseline information, it may be difficult to achieve certain improvements in the sector be it in terms of livestock trade, the provision of animal health services etc. For example, if the country's ambitious export program is aimed at reaching a given export volume expressed in millions of animal numbers a year, how can the country determine what it can export without significantly affecting its resource base?

3. MATERIALS AND METHODS

3.1. Description of study area

The study was conducted in Arba Minch Zuria woreda, which is located in Southern Nations Nationalities and Peoples Regional State of south-eastern Ethiopia. The woreda is located between 06°05'N latitude and 37°38□E longitude. Arba Minch Zuria woreda is located at 450 km from Addis Ababa and 275 km from the regional capital, Hawassa. The total area of Arba Minch Zuria is 139,495.542 ha out of which 84,365 ha is homestead, 6787.651 ha natural pasture, 211,421 ha cultivated land, 4981.495 ha is covered with improved forage, 938.87 ha wood-land, 4377.395 ha protected forest land, 590.651 ha closed plantation land, 23,319.57 ha occupied by church and mosque and the rest 2713.91 ha unusable land. The woreda is bordered in the south by the Dirashe Special woreda, in the west by Bonke, in the north by Chencha, in the northeast by Boreda Abaya, in the east by the Oromia region, and in the southeast by the Amaro Special woreda. The woreda also includes portions of two lakes and their islands, Abaya and Chamo. The woreda has an estimated total population of 232,432, of whom 114,370 are men and 118,062 are women; 72,507 or 31.19% of its population are urban dwellers (CSA, 2005).

According to AZWARDO report, the woreda is characterized agro-ecologically with 14%, 53% and 33% of the land area classified as *Dega* (highland), *Woinadega* (mid altitude) and *Kolla* (lowland), respectively. The annual rainfall is ranges from 750 mm to 930 mm and the temperature ranges from 16-37^0 c and elevation ranges from 1200masl to 3121masl. In the woreda there are 49,243 Cattle, 11,977 Sheep, 18,588 Goat 733 Donkey, 735 Mule, 698 Horse, 32,131 Chicken and 6055 Bee colonies.

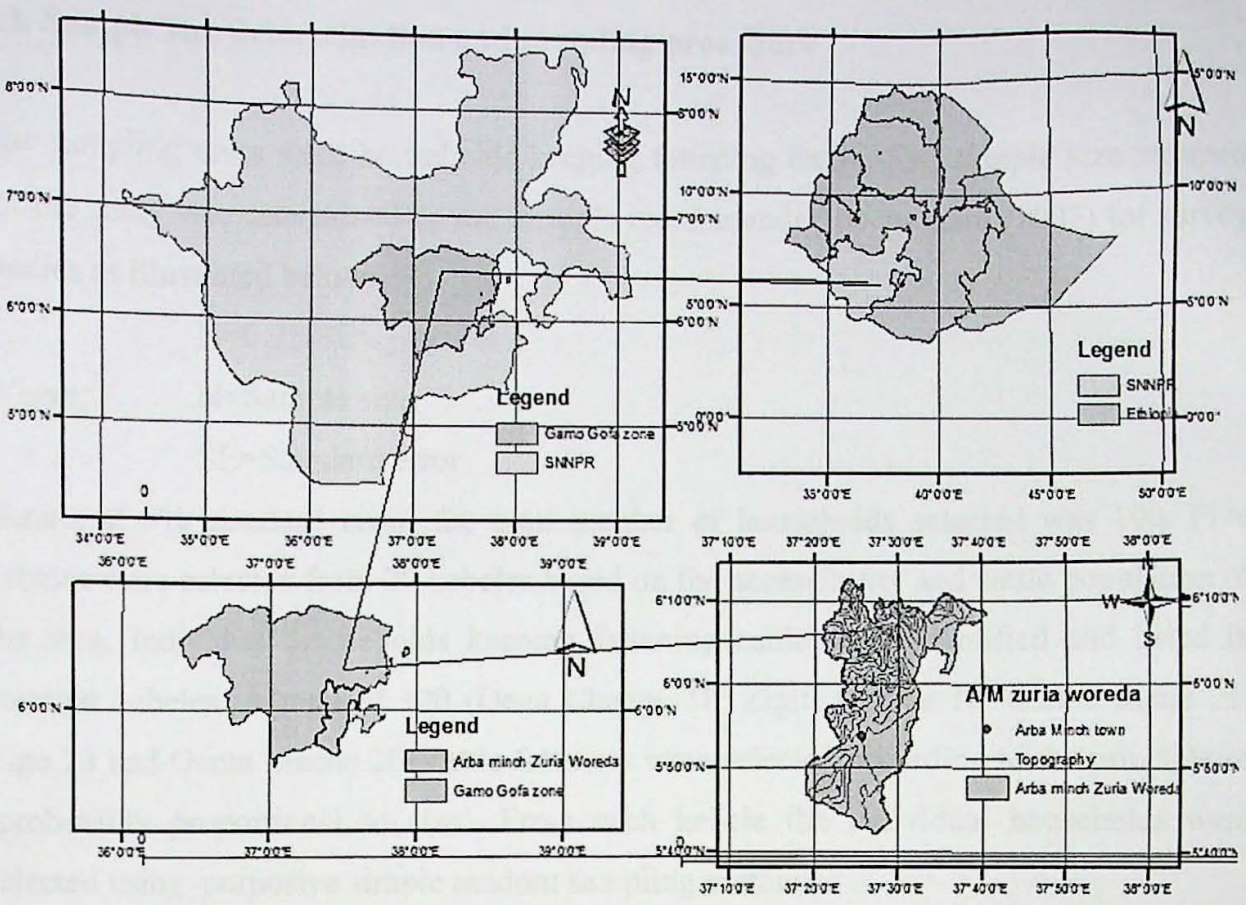


Figure 1: Location map of the study area

The production system of the woreda is characterized as a mixed crop-livestock system where the farmers used their land mainly for cropping purpose. From the major crops, maize, teff, wheat, barley, root and tuber (potato, cassava and taro) are the major crop types widely produced in the woreda. In *kolla* areas of the woreda, vegetables and fruits are grown on the irrigated land by using major rivers (Harre, Kulufo and Sile).

3.2. Study population and study design

Households keeping fattening cattle and fattening cattle kept by the farmers were the study population. The type of the study was a cross-sectional study. The study design involved formal surveys, focus group discussions, field observation and market monitoring.

3.3. Sample size determination and sampling procedure

The sampling units were households keeping fattening cattle. The sample size required for the study was determined by the formula recommended by Arsham (2007) for survey studies as illustrated below:

$$N=0.25/SE^2$$

Where: N=Sample size

SE=Standard error

Hence, at 5% standard error, the total number of households selected was 100. Five kebeles were selected from 29 kebeles based on the accessibility and cattle population of the area. Individual households keeping fattening cattle were identified and listed in selected kebeles. A total of 100 (Dega Change 18; Zigiti Bakole 18; Chano Melle 21; Elgo 23 and Genta Meche 20) cattle fatteners were selected according to the principle of 'probability proportional to size'. From each kebele the individual households were selected using purposive simple random sampling methods.

3.4. Data collection

Data collection involved secondary as well as primary data. Both qualitative and quantitative data were collected by employing the following methods:

3.4.1. Formal survey

A formal survey was carried out with the help of a structured questionnaire. The questionnaire consisted of open-ended and closed-ended questions being developed with focusing mainly on cattle fattening practices (feeding, watering, housing and healthcare) and marketing systems. Development Agents (animal science graduates from ATVET colleges) working in the woreda who speak the local *Gamugna* language were recruited, and trained on ways of handling and administering the questionnaire (Annex 6). The process of data collection was closely supervised by the principal researcher.

3.4.2. Focus group discussions

Elders, village leaders and individuals who are knowledgeable about the socio economic situation and cattle fattening practices in the area were selected for discussion by the help of agricultural extension workers. Group discussions consisted of 9-11 farmers made per each identified population and the researcher facilitated the discussion at all sites. The main points for discussion included: major constraints for cattle fattening in the area.

3.4.3. Field observation

Field observation was made to enrich the data about feeding, watering, housing, healthcare and marketing of fattened cattle. The house was observed for neatness and adequacy in providing enough ventilation and space for the animals (if they are sheltered in closed houses). The amount and cleanness of water which was used by the farmers and the accessibility and the type of drinking water were also observed.

3.4.4. Rapid market appraisal

In order to assess the marketing system of fattened cattle, Rapid Market Appraisal (RMA) techniques was employed (Miles, 2000). Before administering RMA on the different marketing agents, the number of permanent cattle traders in the study area was identified. The data obtained from these market agents was used to summarize marketing chains, marketing channels, marketing problems and possible solutions. In the study area local butchers, cattle traders and individuals/group consumers were identified as marketing agents. Available cattle traders were interviewed at the two main market places in the woreda, namely, Chano-Melle, and Kola Shelle.

3.5. Data management and statistical analysis

All data collected from survey were entered, checked and managed using Microsoft Excel computer program. Analyses of all data were carried out using statistical package for social sciences (SPSS, 2007 Version 16) statistical software. The data were summarized using descriptive statistics (mean, standard error and frequency distribution). The quantitative data means between study sites were compared using one way analysis of variance (One Way ANOVA) in SPSS. Chi-square (X^2) test was employed to see statistical differences between qualitative variables.

4. RESULTS

4.1. Socio-economic characteristics

4.1.1. Description of the households

Family size, sex and age structure of the farm families of the study area are presented in Table 1. The mean family size in Arba Minch Zuria woreda was 7.32±0.280 persons/HH. Among the household members, 51.91% and 48.09% were males and females, respectively.

Table 1: Family size, age and sex structure of farm families of the respondents

Variable	Total	
	Total number	Percentages
Sex:	N=100	
Male headed	80	80
Female headed	20	20
Mean age (SE)/years	45.33(0.24)	
Age category of HH members		
≤5 years	60	9.19
5-15 years	261	35.65
15-64 years	403	55.05
>64 years	8	1.09
Sex category of HH members		
Male	380	51.91
Female	352	48.09
AVF(SE)	7.32(0.28)	

AVF: Average Family, SE: Standard Error

Among the studied households, 80% were male-headed, while the remaining (20%) were female-headed (Table: 1). the average age of the household head was 45.33 years and it ranged from 26-71 years. Concerning the age categories, 55.05% of the household members were in the age group between 15- 64 years, while 35.66% of household members were between 5-15 years. Whereas, 10.28% of household members were in the age categories less than 5 years and above 64 years old.

Educational background of the households is summarized in Table 2. The educational status of the households indicated that 53% non formal, 32% primary, 12% secondary and 3% beyond secondary.

Table 2: Educational level of the household heads in Arba Minch Zuria woreda

Education level	Percentage
No formal	53
primary	32
secondary	12
Beyond secondary	3

No significant difference ($p \geq 0.05$) were observed in educational level among kebeles (Annex 1).

4.1.2. Description of the Landholding

Landholding categories and average landholding size in Arba Minch Zuria woreda are presented in Table 3. The average private land holding in the study area was 2.00 ha per household, and ranged from 0.5 to 4.00ha. About 63.03% of the land holding was allocated for cultivated land and land allocated for homestead, private grazing, forage and closed plantation was 23.17%, 4.35%, 2.97%, 7.15% respectively.

Table 3: Private land holding and use patterns per household in the study area

Types of land use	Mean± SE	Total (ha)
homestead	0.47±0.02	46.6
Cultivation land	1.27±0.07	126.75
Private grazing land	0.28±0.12	8.75
Forage land	0.18±0.02	4.62
Closed plantation land	0.32±0.03	14.37
Total private land	2.01±0.09	200.59

SE: Standard Error

In the study area the mean (± SE) land holding was 2.01 ± 0.24 ha. There was a significant ($P \leq 0.05$) difference among the five kebeles in land holding (Annex 2). Elgo had larger farm size (2.51 ± 0.48 ha) than the rest of the kebeles, while farmers in Genta Meche kebele had the smallest area of land (1.52 ± 0.51 ha).

4.1.3. Description of livestock holding and cattle herd structure

Livestock compositions of the sampled households in Arba Minch Zuria woreda are presented in Figure 2. From the interviewed households, it was observed that the livestock species composition in study area was cattle (37.72%), sheep (13.20%), goats (12.62 %), equines (3.14%), chicken (30.41%) and bee colonies (2.90%).

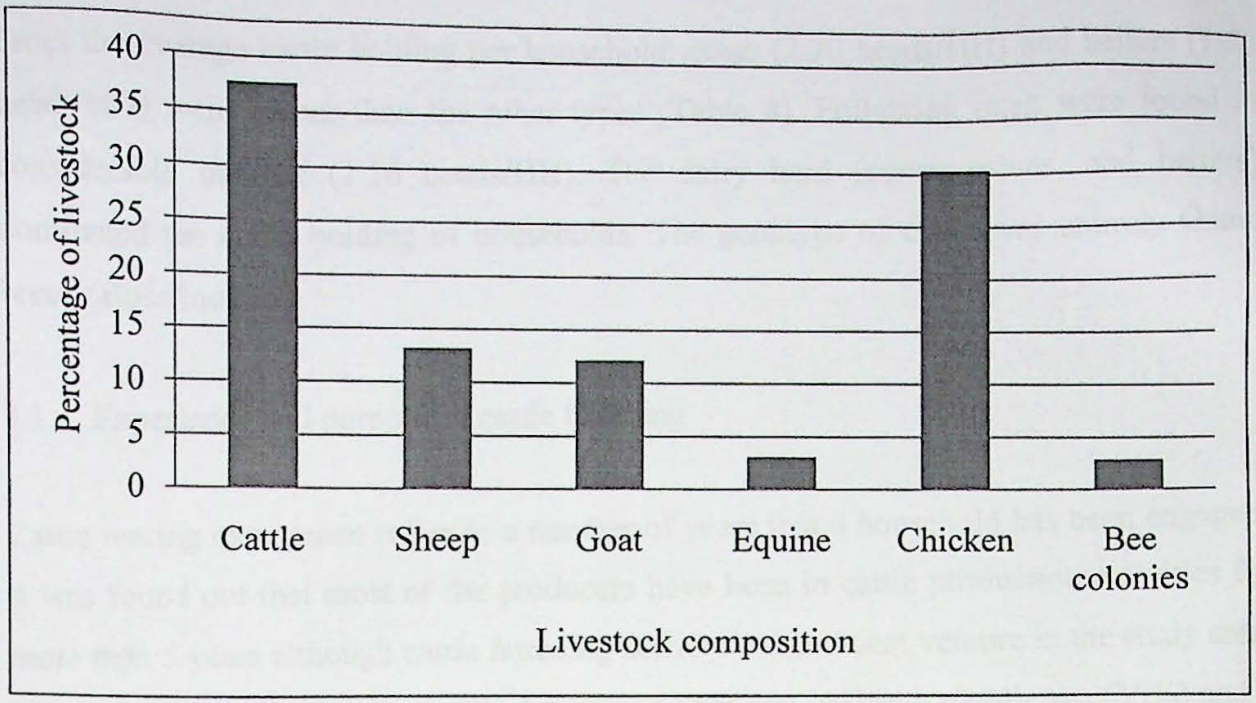


Figure 2: Livestock composition in the study area

The mean of cattle holding per household in study area was 7.80±0.28 heads/HH. There was a significant ($P \leq 0.05$) difference among kebeles in cattle holding (Annex 3). Elgo had larger cattle holding (9.61 ± 0.52) than the rest of the kebeles, while farmers in Genta Meche kebele had the smallest cattle holding (5.60 ± 0.42) (Table 4).

Table 4: Cattle herd composition of the study area

Herd type	Mean± SE	Percentage
Ox	1.56±0.59	35.5
Bull	1.47±0.62	16.5
Cow	2.70±0.10	35.5
Calf < 1 year	1.51±0.07	15.6
Heifer	1.70±0.08	17.2
Total cattle herd	7.80±0.28	100

SE: Standard Error

From the average cattle holding per household; cows (2.70 heads/HH) and heifers (1.70 heads/HH) were higher than the other types (Table 4). Following oxen were found in considerable number (1.56 heads/HH). The dairy herd (cows, calves, and heifers) dominated the cattle holding of households. The genotype of cattle was entirely Gamo breed (Boss Indicus).

4.1.4. Experience and purpose of cattle fattening

Cattle rearing experience refers to a number of years that a household has been engaged. It was found out that most of the producers have been in cattle production activities for more than 5 years although cattle fattening activity was a recent venture in the study area. The surveyed producers start cattle fattening a year ago (63%), a month ago (35%) and a few weeks ago (2%). (Table: 5).

Table 5: Household experience in cattle fattening in Arba Minch Zuria woreda

Start of fattening	Percentage
A year ago	63
A month ago	35
A weeks ago	2

Major objectives of cattle fattening in Arba Minch Zuria woreda are presented in Table 6. According to the interviewed farmers, cattle fattening activities were carried out to fulfill different functions, which include increasing income (73%), safeguard the family against risk (20%) and as source of food (7%) where on the other hand, the role of cattle to provide other commodities such as manure and hide and skin were considered as secondary in the area.

Table 6: Major objectives of cattle fattening in Arba Minch Zuria woreda

Objective	Percentage
To increase income	73
To safeguard the family against risk	20
Source of food	7

4.1.5. Access of farmers to information

The farmers in Arba Minch Zuria get information on cattle fattening from different sources as indicated in Figure 3.

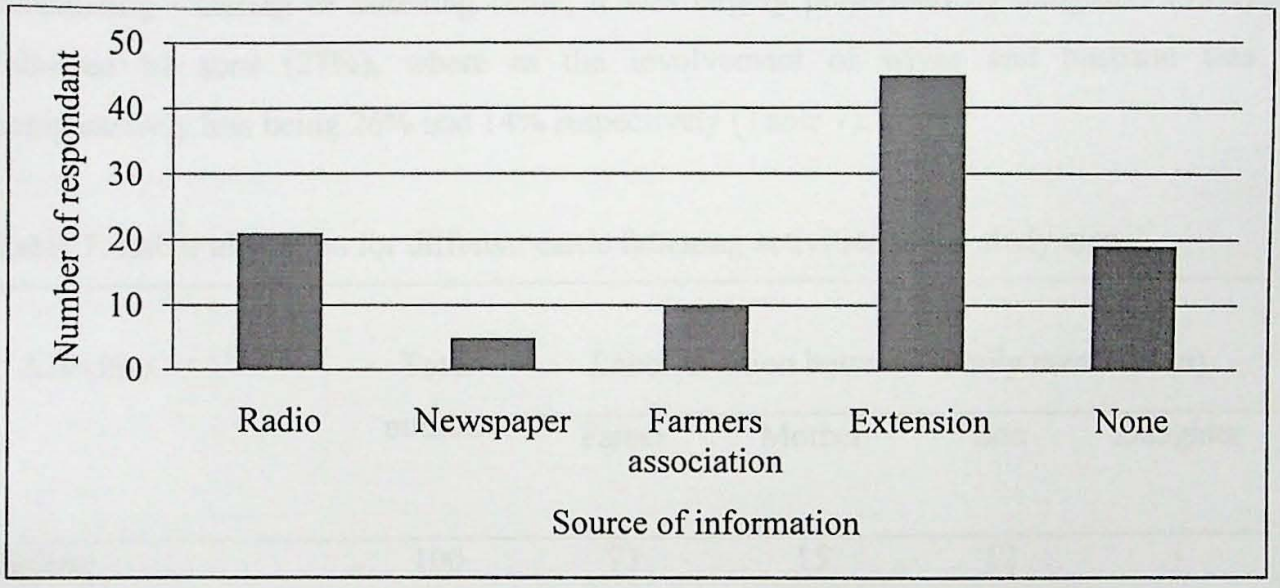


Figure 3: Sources of information on improved cattle fattening in the study area

As shown in the figure 3, 45 % of the farmers got information about improved cattle fattening practice from extension agents. Farmers were also getting information from mass media (radio and newspaper). About 21 % of the farmers indicated that radio as a good source of information on improved cattle fattening, whereas 19% of the farmers had no access of information about improved beef cattle production.

4.1.6. Labor allocation for different cattle fattening activities

Labor allocations involved in fatten cattle selling; herding, feeding and watering in Arba Minch Zuria woreda are summarized in Table 7. Fattened cattle selling mainly involved husbands (73%) and to some extent wives (15%), where as boys (12%) were occasionally engaged in this duty (Table 7). The regular selling activity is usually done by husband during major holidays and market day.

Herd keeping of the cattle was mostly left for sons (62%) and daughters (15%). Feeding of fattening cattle was mostly performed by wives (54%) followed by husbands (20%) and daughters (19%), the involvement of sons was relatively less (7%) (Table 7), considering watering of fattening cattle; it was largely performed by daughters (33%) followed by sons (27%), where as the involvement of wives and husband was comparatively less being 26% and 14% respectively (Table 7).

Table 7: Labor allocation for different cattle fattening activities in the study area

Activities	Total number	Labor division between family members (n)			
		Father	Mother	Son	Daughter
Selling	100	73	15	12	-
Herding	89	10	2	62	15
Feeding	100	20	54	7	19
Watering	100	14	26	27	33

4.2. Cattle fattening practices

4.2.1. Feed resources and feeding systems for fattening cattle

The feed resources of livestock production in Arba Minch Zuria are the private and communal grazing lands, crop residues, conserved forages such as hay, agro-industrial byproducts and concentrate and crop aftermath, whereas feed the resources for fattening cattle are seasonally available green pasture and weeds grown within and at the boundary of the farm land, natural pasture , crop residues particularly maize stalk ,teff straw, barley straw, wheat straw and sorghum stalk, and stubble grazing in the backyard. According to the response of households, among the major basal feeds given for the fattening cattle, fresh cut green forage accounts for the largest (38%) followed, natural grazing, crop residue and hay with 29%, 21% and 12% respectively (Table 8).

Table 8: Major feed resources for fattening cattle in Arba Minch Zuria woreda

Major feed resource	Percentage
Natural grazing	29
Fresh cut green forage	38
Crop residue	21
Hay	12

The experience of using supplements and type of supplement used by the households in study area for fattening purpose are presented in Table 9. Out of the total households interviewed, 41.8% used feed supplement, while 58.2% did not use feed supplement. From the feed supplements used, wheat and corn bran and middling's were the leading feed supplements which accounted for about 59% and were followed by local brewery byproducts (33.33%) and oil seed cakes (7.7%).

Table 9: Experience of using supplement and type of supplement in the study area

Variable	Total number	Percentage
Experience of using supplement	100	
Yes	42	42
No	58	58
Type of supplement	39	
Wheat and corn barn and middling	23	59
Oil seed cake	3	7.7
Local brewery by product	13	33.3

Four feeding lengths that have been identified overall in the study area were 2 months (9%), 3 months (46%), 4 months (35%), and five and above months (10%) of the respondents(Table 10). The feeding lengths were not significantly different ($P \geq 0.05$) among kebeles (Annex 4). When computing these proportions, the average length of feeding was estimated to be 115 days.

Table 10: Feeding length of fatten cattle in the study area

Length of feeding	Percentage
2 month	9
3 month	46
4 month	35
≥5 month	10

The observed feeding systems were partial and pure feedlot methods which accounted for 67% and 33%, respectively. Out of cattle fattened under the partial feedlot method, about 8.95%, 46.28%, 38.80% and 5.95% were finished after 2, 3.4, and ≥5 months of feeding respectively. Whereas, out of the cattle fattened under pure feedlot method were finished

after 2, 3, 4 and ≥5 months of feeding with 9.09%, 45.45%, 27.27% and 18.18%, respectively.

4.2.2. Water resource for fattening cattle

According to the respondents, three types of water sources used in Arba Minch Zuria woreda were river (46%), pond (27%), and hand dug well (27%) (Table 11), the majority of households (43%) provided water twice daily and 37% and 20% watered their fattening cattle once and three times per day respectively(Table 11). But there was no significant (P≥0.05) difference among kebeles on watering frequency of fattening cattle (Annex 5). The average distance to watering points from the camping area was 0.43±0.05 km (Table 11).

Table 11: Sources of water and frequency of watering for fattening cattle in study area

Variable	Percentage
Source of water	
River	46
Wall	27
Pond	27
Watering frequency	
Once per day	37
Twice per day	43
Three per day	20
Average distance in km (SE)	0.43±0.05

SE: Standard Error

4.2.3. Housing of fattening cattle and waste management

In the study area fattening cattle were tethered either on the farmland or in fences near the homestead during the day time. Most farmers house their fattening cattle during the night time. According to the interviewed farmers the three types of houses which had been used to keep the fattening cattle were separate house constructed for the cattle (44%), enclosed barn with simple shed (29%) and separate room in the family house (27%).

The majority of the respondents (53%) used the dung for soil fertilization and the rest 27% and 2% used for to make cow dung cake and for construction purpose respectively. Whereas 18% of the respondents did not use the dung at all.

4.2.4. Health care of fattening cattle

Table 12 summarizes commonly prevalent diseases of fattening cattle in the study area. Out of the total households sampled, 77% reported disease occurrence as a major problem of cattle fattening in the area. However, the intensity and type of diseases varied from area to area.

Table 12: Major fattens cattle disease in Arba Minch Zuria woreda.

Variable	Percentages
Disease occurrence	
Yes	77
No	23
Major diseases	
Trypanosomosis	32
Ecto-parasite	23
CBPP	7
Blackleg	15
Internal parasite	14
Pasturolosis	6
Anthrax	3

Based on the current study, four types of diseases were identified as major health problems of fattening cattle in Arba Minch Zuria woreda which involved trypanosomosis (32%), ecto parasites (23%), blackleg (15%) and internal parasites (14%). In addition, other diseases reported with minor degree of importance include, contagious bovine pluro pneumonia (CBPP) (7%), pasturolosis (6%) and anthrax (3%) These being the overall situation, notable differences were observed regarding the type of diseases prevailing in the kebeles. For example, considering the major diseases, trypanosomosis was reported as the major threat in Elgo kebele (43.5%) and to a considerable extent in Dega Change kebele (22.2%). On the other hand, the occurrence of ecto parasites was fairly comparable in the five kebeles.

4.2.5. Season of cattle fattening

According to the response of the households and observations made at Chano Melle and Koll Shelle cattle markets of the woreda, cattle fattening was a time bound activity considering the available resources like feed, labor, and demand of the market.

About 57% of the cattle fattening was done starting from early June up to mid September when the supply of feed increases mainly targeting to deliver fattened cattle for Meskel holiday, 29% of the cattle fattening activity was done starting from late September to mid December targeting to deliver fattened cattle for Christmas and the remaining 14% of cattle fattening was late December to late March targeting to deliver fattened cattle for Easter. Starting from late April (after Easter) up to late May, cattle fattening was totally absent in the study area.

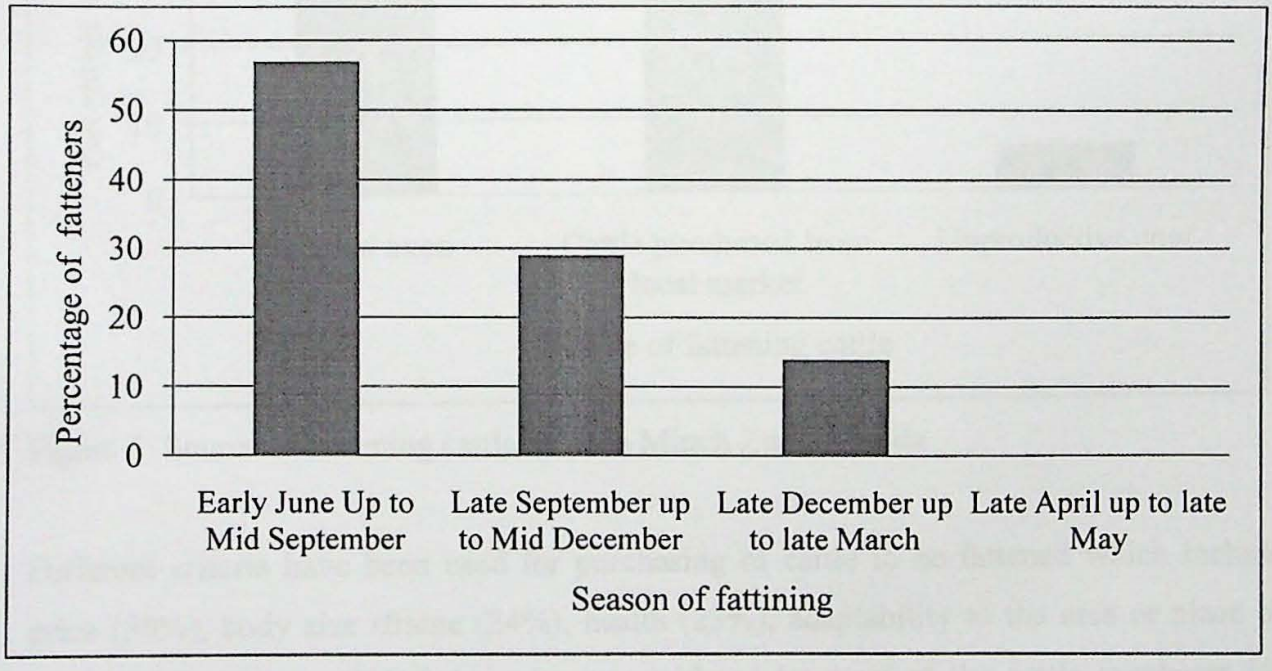


Figure 4: Season of cattle fattening in Arba Minch Zuria woreda

4.2.6. Source and selection criteria of fattening cattle

The reported sources of cattle for fattening in the study area include culled oxen due to old age or being unproductive (54%), cattle purchased from local markets (40%) and unproductive cows (6%) (Figure 5). Among the cattle sold for slaughter on the market during the study period, 65% were older plowed and mature oxen and 30% were young bulls whereas the remaining 5% were unproductive cows which have been fattened due to old age, sterility and other defects.

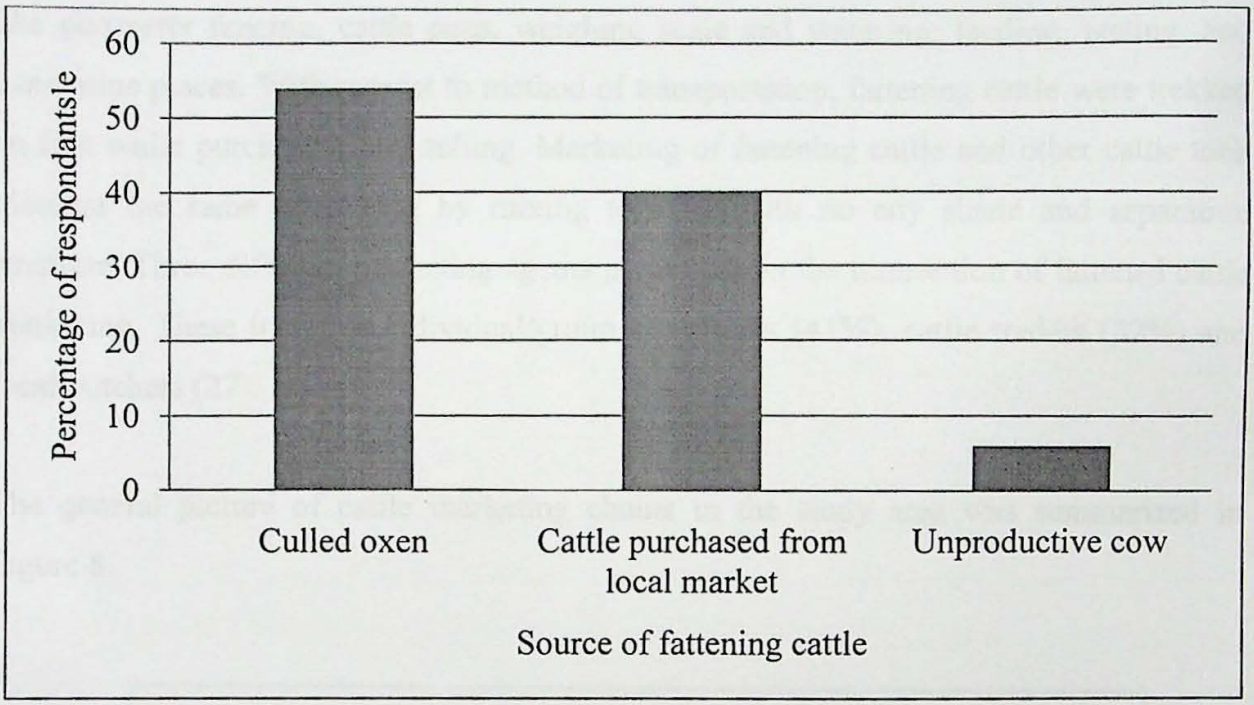


Figure 5: Source of fattening cattle in Arba Minch Zuria woreda

Different criteria have been used for purchasing of cattle to be fattened which include price (30%), body size /frame (24%), health (23%), adaptability to the area or place of cattle (12%) and age (11%) have been considered by most of the cattle purchaser for fattening purpose in their descending order.

As it is shown in the figure 6 consumers get fatten cattle directly from producers or indirectly from butchers and cattle traders.

During marketing the producers have different criteria for selecting their market outlets. Figure 7 presents the criteria used by fatteners for selecting their market outlet. Out of the 100 respondents (48%) were selecting price as criteria the rest 21%, 20% and 11% select marketing outlets based on long term contract, reliability and distance respectively.

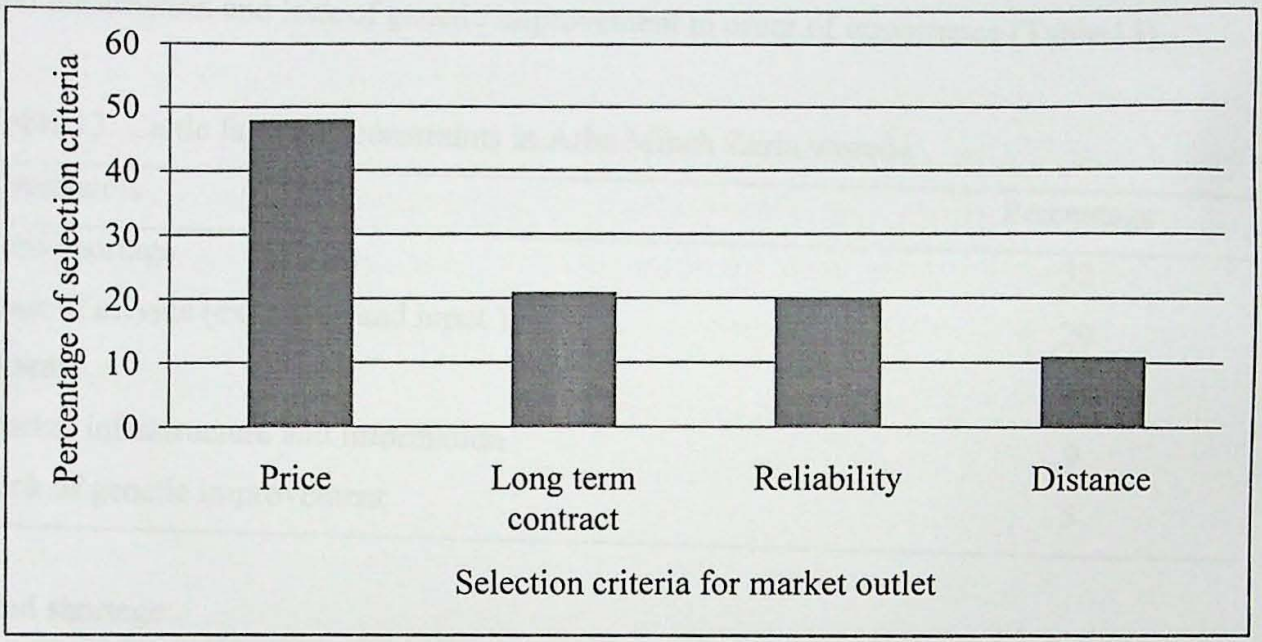


Figure 7: Selection criteria for market outlet in study area

According to the result of the household survey, overall in the study area the mean price of cattle before and after fattening was about 1250 birr and 3470 birr, respectively. During market assessment it's observed that, Prices are usually fixed by individual bargaining. Prices depend mainly on supply and demand, which is heavily influenced by the season of the year and the occurrence of religious and cultural festivals. As per the market assessment, the price of fattened cattle was lower during Meskel as compared to Christmas and Easter. This may be due to more supply of fattened cattle during Meskel holiday. But during Easter the supply of fattened cattle was very low. Hence limited supply of fattened cattle to the market have got relatively higher price.

4.3. Major constraints and opportunities for cattle fattening

4.3.1. Constraints

According to the results of structured interview supported with focus group discussions and field observations held in each of the study kebeles, the major constraints that hindered the performance of cattle fattening activity in the woreda were mentioned as feed shortage, lack of service (extension and input), disease, lack of market infrastructure and information and lack of genetic improvement in order of importance (Table 13).

Table 13: Cattle fattening constraints in Arba Minch Zuria woreda

Constraints	Percentage
Feed shortage	32
Lack of service (extension and input)	29
Disease	25
Market infrastructure and information	9
Lack of genetic improvement	5

Feed shortage:

Due to change in land use grazing lands have been continuously lost to cropping. This has led to overgrazing of natural pastures and land degradation. The major reasons for feed shortage are expansion of croplands, poor feed conservation practices and lack of forage seeds. For these reasons, feed shortage both in quality and quantity has become a serious problem for cattle fatteners. Moreover the annual feed supply varied with seasons both in quantity and quality in that excess feed having relatively higher digestibility and better nutritional composition is available during rainy season (early June up to mid September) and feed scarcity coupled with lower digestibility and poor nutritional composition were observed during dry season (late April up to late May). Furthermore

unavailability of agro-processing industries in the nearby area caused the cost of supplementary feeds to be unaffordable by individual fattener households due to high transportation cost from farther areas.

Lack of services (extension and input):

As discussed with farmers, most farmers lack appropriate services of extension and inputs. Farmers reported that cattle fattening activities are not assisted by appropriate extension services regarding improved husbandry practices and marketing. Due to this reason, most of them followed traditional production system. With regard to finance, cattle fattening in Arba Minch Zuria woreda finances itself through a combination of self-financing and informal credit assistance from friends and relatives, suppliers and customers. Loans from banks seem to be important to bigger producers only; with small cattle fatteners unable to offer collateral, are insignificant users of loans from formal financial institutions.

Disease challenge:

Secondary data collected from private and governmental veterinary clinics coupled with focus group discussion showed a number of diseases that hindered the performance of cattle fattening activity in the study area. The most prevalent diseases noted during this study were trypanosomosis, ecto-parasites and internal parasites. The most dominant external parasites observed in the area were ticks, flies and leachs whereas among the internal parasites liverfluke and cestodes were the prominent ones. Despite the existence of high disease incidences, there was no adequate animal health service provided parallel to their way of production system.

Market infrastructure and information:

Lack of appropriate physical infrastructure is one of the major obstacles to the development of an efficient marketing system in the woreda. The majority of the interviewed traders respond there were no livestock holding pens or crushes, feeding and watering facilities and the existence of hygienic and secure market centers in the woreda. In terms of information, most cattle traders have varied levels of access to information about supply, demand and price conditions in the domestic market. The types of market information sources that cattle traders consult, however, are limited. Most of the farmers obtained market information from their neighbors and relatives; some of them listened to the radio and/or received information from middlemen. Nonetheless, due to the variety of sources of market information, the available information is not always systematic and reliable

Lack of genetic improvement:

All fattening cattle in the study area are indigenous zebu breeds and have not been characterized. There is no systematic selection and controlled breeding. Many farmers breed their cows with any bull available in the herd. The majority of the farmers prefer indigenous breed claiming that crossbred animals are susceptible to feed shortage and diseases. There has been no effort to improve cattle fattening through crossbreeding in the district.

4.3.2. Opportunities

In most parts of the study area where the environment is suitable for fattening, there are large numbers of smallholder farmers who have the potential to engage in cattle fattening. Many of these farmers already operate mixed crop–livestock farms in which cattle are used mainly to provide draught power and manure.

In the woreda there is a great opportunity of irrigation practice coupled with rain feed cultivation it is possible to produce suitable multi-purpose nitrogen-fixing fodder trees like *Sesbania sesban* along the farm boundary at the same time producing high biomass and high energy feeds like sugarcane tops and sweat potato residue to be supplemented for fattening cattle.

Since there is a huge coverage of maize production in the district, there is a possibility of increasing the quantity and quality of stubble grazing of the maize farm through under-sowing production with suitable nitrogen fixing forage species like, vetch and lablab. Feeding of green fodder especially of nitrogenous feeds for cattle whose basal feed is crop-residue helps to create a better micro climate for rumen micro-flora which ultimately increases utilization efficiency of crop-residues by the cattle. There is also a great potential of the thinning, leaf strip and green covering cob of the maize to be use as potential feed source for fattening cattle either as direct cut-and-carry feeding in green state or by making silage for dry season feeding.

The presence of Arba Minch and Wolayta Soddo universities nearby is the other potential that encourages the producers to sell their fattened cattle that help to enhance the producers' economic return. The continuous demand of fattened cattle for the trainees' consumption in the universities even during the fasting period also encourages the producers to fatten their cattle and be able to supply without seasonal market interruption.

5. DISCUSSION

According to this study, the mean family size was 7.3±0.20 heads/HH in study area. The result obtained in this study is comparable with 7.39heads/HH (Sintayehu *et al.,* 2008) in Shashemene-Dilla and 7.26 heads/HH in Wolayta area (Ayantu, 2006). However, the result found in this study is higher than the Ethiopian national average which is 5.2 heads/HH (CACC, 2002) and 5.7 ± 0.1 heads/HH reported by (Tesfaye, 2008) for Metema district.

Referring to the sex of the head of the households, this study showed that 80% of the households were male and 20% were female headed which is disagree with Azage (2004) where it was reported that 33.0% female and 67.0% male headed livestock keepers in Addis Ababa and comparable with Ojuni (2009) reported that, 82.6% male and 17.4% female headed livestock keepers in Gambella region. In this study, it was found that the average age of the household heads was 45.33 ± 0.24years. This average age of the households is comparable with the 44.3 years obtained for cattle keepers in Fogera district (Belete, 2006). According to CSA (2008), all age groups who are above ten years old in the rural areas of Ethiopia are involved in agricultural activities. Thus, it can be understood that family members in the productive age group (55.0%) were higher than that of the non-productive age groups and this in turn implies that households have good source of family labour.

Forty seven percent of the sampled respondents had access to education. This can be interpreted in such a way that farmers who are educated are more eager to grasp new ideas and allocate their resource to their best use. Besides, they could have a better understanding of the technology and could recognize the importance of having improved breeds and productive herd through better management and improved feeding system. Furthermore education has been shown to play a positive role in the adoption of new

technology. Farmers with high education levels adopt usually new technologies more rapidly than lower educated farmers (Ofukou *et al.*, 2009).

The average landholding in the study area was 2.00 ha/HH with a range of range of 0.5-4.00 ha. The average land holding in the study area is comparable with the result (2.5 ha) reported for Alaba district by Yeshitila (2008). However, it is less than (3.3 ha) that reported by Yitaye *et al.*, (2007) in the highland areas of Amhara region and (5.28 ha) that reported by Tesfaye (2008) in Metema district.

The mean cattle holding per household in the study area was 7.80±0.28 heads/HH. This value of cattle holding is similar to the 8.01 heads/HH reported for the Mekelle area (Negussie, 2006). However, the current finding is much lower than the holdings in Metema district (15.53 ± 0.71 heads/HH) reported by Tesfaye (2008).

The herd structure found in the study area was dominated by cows (35.5%), followed by heifers (17.2%), bull (16.5%), oxen (16.0%) and calves (15.6%). The result of the current study is higher (29.14%) than that reported for Girar Jarso area of Ethiopia by Tolera (2007). However, it is lower than what has been reported by Kelay (2002) for Selale woreda where cows comprised of 38.7-44.7% of the cattle herd. It also seen that cattle herd size was positively related to size of land holding size. Households with larger land holdings keep more animals because they need more draught power to cultivate their land and this also enables them to produce more straw that helps them to support a greater number of animals (Bayush *et al.*, 2008).

The genotype of cattle was entirely indigenous zebu cattle, which is agrees with CSA (2008) reported that, about 99% of the cattle population in Ethiopia are indigenous that are adapted to feed and water shortages, disease challenges and harsh climates.

Although cattle fattening in the study area was a recently introduced economic activity, the producers' survey had indicated that most of the producers have been involved in cattle production activities for more than 5 years. Similarly, Tesfaye (2008) reported that most cattle fattening experience is quite a recent venture started following the increased demand for Ethiopian cattle in the Sudan livestock market in Metema district. In Ethiopia, the transition from a centrally controlled economy to a market economy in the livestock sector has stimulated the farmers to produce more live animals each year and to improve fattening practices by using proper timing and inputs (FAO, 2004).

Objectives of cattle fattening in the study area were to fulfill multipurpose function, amongst of which the main functions were to increase income (73%), to safeguard against risk (20%) and as source of food (7%). It is comparable with Shitahun, (2009) reported that, fatten cattle constitute the main capital reserve of the farming households, income source, serving as a coping strategy that utilizes seasonally available low-cost feed resources and hence reduces risk and adds stability to the overall farming system in Bure woreda .

Regarding labor division among family members in performing day-to-day farm activities, most of the responsibilities were on the shoulders of the farm owner and his spouse. Selling of fattened cattle was mostly the responsibility of the male household members whereas their female counterparts were responsible for feeding of fattening cattle. Children (boys and girls) are given responsibilities mainly for herding and watering of fattening cattle. Similar to Belete (2006) reported that, most of the livestock herding is performed by family labor (boys and girls) in Fogera district. But opposed to Tesfaye (2008) reported that, most of the livestock herding is performed by hired labor in Metema district.

Alemayehu (2004) reported that the major livestock feed resources in Ethiopia are natural grazing and browse, crop residues, improved pasture, and agro-industrial by-products.

The major basal feeds given for the fattening cattle were fresh cut green forage (38%), natural grazing (29%), crop residue (21%) and hay (12%) in the study area. Insufficient land and lack of inputs such as the forage seeds and lack of information were among the reasons for not growing their fodder crops. Out of the total sampled households 41.8% used feed supplement, while 58.2% did not use feed supplement. Feed supplements given to the fattening cattle in the study area were wheat and corn bran and middling, local brewery byproduct and oil seed cake. According to the respondents households did not provide supplementary feed for their fattening cattle due to higher cost and unavailability in the area. The current study is similar with Shitahun, (2009), reported that the major basal feeds given for the fattening cattle were fresh cut green forage (59.48%) and followed by maize Stover, hay and pasture grazing with 20.92%, 10.46% and 9.15% respectively. Whereas, supplements given to the fatten cattle were local brewery byproducts (57.27%), chopped row pumpkin (15.04%), mixed ration prepared in the house (13.27%), oil seed cake (7.97%), and maize grain with its cob (5.31%) in Bure district. But opposed to the work of Aklilu (2004) reported that, the prominent feed used by almost all contacted fatteners are grass hay, crop residues such as teff and wheat straw and pulse residues such as bean and *guaya* straw. Whereas, supplements given for cattle fattening are noug cake, wheat bran and shorts which are locally called *furushka*, and leftovers of the household level local beer termed as *Atela* in Amhara region.

Four feeding lengths have been identified in the study area were 2 months (9%), 3months (46%), 4 months (35%), and five and above months (10%). When computing these proportions the average length of feeding was estimated to be 115 days, which is similar with Aklilu (2004) reported that, there is a huge variation in the length of feeding, with the range extending from as short as 60 days to as long as 180 days. The modal range seems to be within the 90 to 120 days interval in Amhara region. Fattening techniques relies on a minimum time of three months up to a maximum of about 18 months to 2 years. The length of the period depends up on the characteristics of the animals used and the food resources available (Pagot, 1992).

The farmers used different water source for their fatten cattle in the study areas. The main sources of water were river (46%), pond (27%) and hand dug well (27%). The majority (43%) of households provided water twice daily and 37% and 20% watered their fatten cattle once and three times per day, respectively. But there was no as such significant (P> 0.05) difference among kebeles on watering frequency of fattening cattle. 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. The current work is similar to Shitahun, (2009), reported that water sources identified in Bure woreda are river (58%), spring (32%), and hand dug well (10%). With respect to watering frequency the same authors reported that about 72% and 28% of the respondents offered drinking water for their fattening cattle twice and three times per day, respectively. Limitations on water intake depress animal performance quicker and more drastically than any other nutrient deficiency. Water deprivation affects feed intake (Steiger *et al.,* 2001), metabolism and productivity. Domestic animals can live about sixty days without food but only seven days without water. The provision of adequate quantities of clean drinking water is a major prerequisite for satisfactory milk production, growth and animal health (Little and Shaw, 1978).

Most farmers house their fatten cattle during the night whereas, Cattle were tethered either on the farmland or in fences near the homestead during the day in the study area. Types of house that has been identified in the district were separate house constructed for the cattle (44%), enclosed barn with simple shed (29%) and separate room in the family house (27%). Which is in agreement with the study of Shitahun (2009) also reported the fattening cattle were housed in separate room in the family house (56%), separate house constructed for the cattle (32%), and enclosed barn with simple shed (12%) in Bure wereda. It also comparable to Getachew *et al.,* (1993) reported that, livestock are kept in a "corral" during the night. During the day, they are herded on communal pasture, private grazing lands or in stubble depending on the season. The present study are disagree with

Belete, (2006) reported that, most farmers house their cattle in the dry as well as wet seasons, although some of them did not house them in both seasons in Fogra district. It also opposed to Tesfaye(2008) reported that all farmers in Metema district used open fenced barn that did not have roofing to shelter larger livestock like cattle (except calves), camel and donkey during night time. Sheltering cattle, not only protects animals from extreme environmental hazards, but also ease some other husbandry practices. Therefore, cattle sheds were not designed in such a way that routine activities like feeding, watering, milking, waste management and other activities can be easily and effectively handled in the study area. The housing conditions were found not good in nearly half of the study area. This was in agreement with the reports of Mekonnen *et al.*, (2005) and Azage and Alemu (1998) who described it as a classical problem of smallholders.

A few cattle fattener immediately after purchase or finished his plowing activity and decided to fatten, brings his cattle for injection and deworming with broad spectrum antihelmentics in the study area.The major fatten cattle diseases highly ranked by respondent farmers were trypanosomosis (32%), ecto parasites (23%), blackleg (15%) and internal parasites (14%) were more common in the study area, which are disagree with the study of Tesfaye (2008) reported that, tick infestation (37.2%), babesiosis (31.6%), Foot and Mouth Disease (FMD) (15.6%) were major health problem of cattle in Metema district. But it is analogous to Shitahun (2009) reported that, the major diseases of fattening cattle in Bure woreda were Trypanosomiasis (30.72%), Liver-fluke (22.88%), Lungworm (20.92%), and Anthrax (12.42%).

About 57% of the cattle fattening was done starting from early June up to mid September, 29% of the cattle fattening activity was done starting from late September to mid December and the remaining, 14% of cattle fattening was late December to late march targeting to deliver fattened cattle to Meskel, Christmas and Easter holidays respectively. The low percentage of cattle fattening activity for Easter market was attributed to the absence of green feed supply and increased purchasing price of fattening cattle. It was

also associated with relative low market demand for fattened cattle because of the custom of the local people preference towards consumption of fattened sheep, goats and chicken instead of fattened cattle during Easter. Starting from late April (after Easter) up to late May, cattle fattening was totally absent in the study area. This is due to feed shortage, high demand of family labor for *Belg* agricultural activity, high demand of oxen for plowing of crop land and low market demand for fattened cattle. The current study is in agreement with the study of Aklilu (2004) reported that, cattle fattening were done targeting to deliver fatten cattle to Christmas season (starting mid of December), Easter season (March/April and for several weeks following), New Year and Meskel (September and following weeks) and Mohamed's birthday in Amhara region. The current study disagree with Belete (2006) reported that, beef producers preferred the period from May to September so as to gain premium price in Fogera district. The result of this study also oppose with Tesfaye (2008) reported that, oxen for meat purpose were supplied to markets majorly from September to December and cows for meat purpose from October to February in Metema district.

Sources of fattening cattle were culled oxen due to old age or being unproductive (54%), cattle purchased from local markets (40%) and unproductive cows which have been fattened due to old age, sterility and other defects (6%) in the study area, which is similar to Shitahun (2009) reported that, sources of fattening cattle in Bure woreda were culled oxen due to old age or being unproductive (51%) and immediate purchase for fattening purpose (49%) and also similar to the work of Aklilu (2004) who reported that, sources of fattening cattle in Amhara region were mature and much older animals (5 to 7 years old). The present result was in deviation with the report of Tesfaye *et al.,* (2005) at Bako Agricultural Research Center, who noted that culled cattle are usually sold for slaughter without improving their body condition when they are too old for ploughing or poor in milk production or when cash shortage forces farmers to sell their animals without any further finishing. Fattening enterprises in western countries typically take immature feeder animals and bring them to market weight for sale to slaughter. Cattle in these

enterprises normally enter the feedlot at well under one year old and are fattened for 6 months whereas in our smallholder farmers commonly fatten mature and therefore much older animals (5 to 7 years old) for shorter durations (usually 3 months) (MOA, 1997).

Different criteria have been used for purchasing of cattle to be fattened in the study area among selection criteria price (30%), body size /frame (24%), health (23%), adaptability to the area or place of cattle (12%) and age (11%), which is different with Aklilu (2004) reported that, animals are purchased based on their large skeletal frames and their body conformations in Amhara region.

Marketing system was one of the least developed in the study area. It was characterized by a large number of highly dispersed markets, which generally lack basic infrastructural facilities like perimeter fencing, cattle pens, weighting scale, watering, feeding, resting, and quarantine place. With respect to method of transportation, fattening cattle were trekked on foot while purchasing and selling, which is in agreement with Belachew and Jemberu (2003) reported that, the structure and performance of livestock and its products marketing both for domestic consumption and for export is generally perceived poor in Ethiopia; underdevelopment and lack of market-oriented production, lack of adequate information on livestock resources, inadequate permanent trade routes and other facilities like feeds, water, holding grounds, lack or non-provision of transport, ineffectiveness and inadequate infrastructural and institutional set-ups, prevalence of diseases, illegal trade and inadequate market information (internal and external) are generally mentioned as some of the major reasons for the poor performance of this sector.

Marketing agents were participated in the transaction of fatten cattle marketing were individual/group consumer (41%), cattle traders (32%) and local butchers (27%) in the study area, which is comparable to Belete (2006) reported that, beef market participants in Fogera woreda are the producers, service providers, trader and the consumers. But the result of the current study is different with Tesfaye (2008) reported that, six different

marketing agents were participated in the transaction of cattle marketing in Metema district which are producers, middlemen (brokers), itinerants, cattle traders, exporters as well as consumers.

Cattle traders composed of individuals, who were farmers or business persons performing other business activities. They started these activities to supplement other income sources of the household. These market agents purchased cattle from farmers. The traders collected fatten cattle from Chano Melle and Kolla Shele market places in the woreda. The purchased cattle were sold at different sales outlet in the district. Traders sold fatten cattle to government institution, butchers and individual/group consumers. Slaughter and meat handling and distribution facilities are a critical link between the livestock trader and the final consumer. Butchers buy fatten cattle based on their weekly or monthly capacity, and take them for slaughter where available to the Government owned abattoirs. Consumers are rural farmers and town dwellers who buy beef animals in group during holidays. The study is similar to results of other livestock marketing studies carried out in Ethiopia, such as Benin *et al.,* (2003).

6. CONCLUSIONS AND RECOMMENDATIONS

Fatten cattle in Arba Minch Zuria woreda are an important economic asset, especially among smallholder rural farmers. They provide; generate income, safeguard the family against risk and as source of food. Over the past decade, the importance of the cattle trade among these food economy groups has been increasing due to the high value of cattle and the ever-increasing seasonal demand for slaughtering and restocking within the woreda and in other parts of the country. But feed shortage, lack of service (extension and input), disease challenge, market infrastructure and information and lack of genetic improvement hindered the performance of cattle fattening activity in the study area.

In line with the above conclusions the following recommendations are forwarded:-

- Improve the available natural pasture, develop and implement over the communal/pastoral rangeland management systems.
- Encouraging private investors to be involved in commercial animal feed production (forage production and agro-industrial feed processing).
- Training and extension advice are urgently required in fattening practice (feeding, watering, housing and health care) and market information to improve the performance of cattle fattening practice.
- Examine the possibility of credit provision for improved cattle fattening and marketing.
- Improve animal health services including drug supply system with close monitoring and supervision.
- A simple, open sided, cattle shed would be constructed along one side of the market square with water troughs, rails and feed bins for cattle to ease marketing.
- Breed improvement should consider the multipurpose utility of local breeds; efforts should be made to characterize the breed.

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8. ANNEXES

Annex 1: ANOVA test on educational level among kebeles

Source of variation	Sum of squares	df	Mean square	F	Sig.
Education level	13.544	4	3.386	3.317	0.14
Error	96.966	95	1.021		
Total	110.510	99			

Annex 2: ANOVA test on landholding among kebeles

Source of variation	Sum of squares	df	Mean square	F	Sig.
Landholding	17.471	4	4.368	6.441	0.000
Error	64.419	95	0.678		
Total	81.889	99			

Annex 3: ANOVA test on cattle holding among kebeles

Source of variation	Sum of squares	df	Mean square	F	Sig.
Cattle holding	235.634	4	58.909	10.243	0.000
Error	546.366	95	5.751		
Total	782.000	99			

Annex 4: ANOVA test on length of feeding among kebeles

Source of variation	Sum of squares	df	Mean square	F	Sig.
Length of feeding	6.430	4	1.607	2.707	0.35
Error	56.410	95	0.594		
Total	62.840	99			

Annex 5: ANOVA test on watering frequency among kebeles

Source of variation	Sum of squares	df	Mean square	F	Sig.
Watering frequency	1.577	4	0.394	0.713	0.585
Error	52.533	95	0.553		
Total	54.110	99			

Annex 6: Questioner for households

Enumerator's name_____

Respondent name _____

Respondent number _____

Region _____

Zone_____

Woreda _____

Kebele _____

Date interviewed_____

Time started _____

Time ended_____

1. Who is the head of the households /family?

   1. Male 2. Female

2. Age of the head of the household _____yrs

3. Education of the head of household:

   1. No formal 2. Primary

   3. Secondary 4. Beyond secondary

4. Religion of head of the household:

   1. Orthodox 2. Muslim 3. Protestant 4. Other (specify)

5. What is the background of the owner or the head of the household?

   1. Farmer 2. Business person 3. Government employee

   4. Retired personnel 5. Other

6. Family size (including the head of the household) under different age category:

Age category		≤ 5 years	5<X<15 years	15≤X≤64 years	>64 years	Total
Sex	male					

	Female					
Total						

7. What kind of agricultural activities are you undertaking?

   1. Crop and livestock
   2. Only livestock production
   3. Crop only

8. Which part of your agricultural activity contributes most of the family income?

   1. Crop Production
   2. Live stock Production

9. Is there farmers' association and are you a member?

   1. There is and I am a member
   2. There is but I am not
   3. There is none

10. If you are a member what benefits do you get?

    1. Credit Service
    2. Input Supply
    3. Other (specify) _____

11. Do you receive any help from a government and non-government Organization?

    1. Yes
    2. No

12. Have you ever participated in any development of cattle fattening activity?

    1. Yes
    2. No

13. If yes, when did you start the fattening activity?

    1. A year ago
    2. A month ago
    3. A few weeks ago

14. How many times you were fattening within a year?

    1. One time
    2. Two times
    3. Three times
    4. One time within two years interval.

15. What months are preferred for fattening?

    1._____

    Why this time is chosen? _____

16. For how many months do you keep animals for fattening?

1. One month 2. Two months 3. Three months

4. Four months 5. Five and above months.

17. Which one is more appropriate and good from the above choice?

1._____

Why? _____-

18. What are the selection criteria for to purchase fatten cattle?

1. Price 2. Health 3. Body size

4. Age 5. Adaptation of cattle to the area

19. How do you know whether the animals are fattened or not?

1. By weight measurement 2. By physical body conformation.

3. When the skin became shin 4. When every bone is covered by meat

5. Others .....

20. Purchasing price of fatten cattle before fattening_____

21. Selling price of fatten cattle after fattening_____

22. Do you castrate your animals before you start fattening? 1. Yes 2. No

23. If yes, what is its importance?

1._____

2._____

3._____

24. Do you have an experience to record weight before you start feeding and other managements?

1. Yes 2. No

25. If yes how much weight differences you achieved on the time of selling?

1. Minimum _____Kg. 2. Maximum _____kg.

26. Who takes care of fattening cattle with regard to?

No.	Activities	Mother	father	Daughters	Sons
1	Selling				
2	Herding				

3	Feeding				
4	watering				

27. How do you get information on cattle fattening most of the time?
    1. Radio 2. Newspaper 3. From farmer's association
    2. From extension agents 5. None
28. What are your reasons for cattle fattening?
    1. to increase the household income
    2. to safeguard the family against risk such as drought
    3. to use the animal products as the source of food
29. Did you have any formal training in cattle fattening? 1. Yes 2. No
30. If yes, for how long did you take the training?
    1. For a few days 2. For a few weeks 3. For a month
31. Where do you take the training?
    1. At the FTCs 2. At Wereda level 3. At the Zone level
    4. At region level

32. What type of animal are you keeping?

Species	Type	Number of livestock			
		Local breed	Cross breed	Exotic breed	total

	Ox				
cattle	Bull				
	Cow				
	Calf (<1 year)				
	Heifer				
	Young bull				
Sheep					
Goat					
equine	Donkey				
	Mule				
	Horse				
Chicken					
beehive					

33. How much land do you have under control in hectares?

No.	Type of land	Hectares
1	Homestead/backyard	
2	Cultivated land including fallow land	
3	Private grazing land	
4	Area under forage cultivation	
5	Closed plantation land	
Total		

34. What is the breed of your fattening animals?

1. Pure breeds
2. Exotic breeds
3. Local/indigenous
2. Cross
5. Mixed

35. What is the source of your fattening cattle?

1. Own production
2. Immediate purchase for fattening
3. Culled cattle due to old age & being unproductive
4. Supplied by agriculture office

36. What is the source of feed for fattening?
    1. Natural grazing 2. Fresh cut green forage
    3. Crop residue 4. Hey
37. What is method of feeding for fatten cattle?
    1. Partial feedlot t2. Pure feedlot
38. Have you ever faced feed shortage for fattening? 1. Yes 2. No
39. If yes, can you mention at what months feed shortages exist?
    1._____
    2._____
    3._____
40. If yes, what was your solution to alleviate the problem?
    1._____
    2._____
    3._____
41. Which crop residue are using for feed?
    1. Teff straw 2.Barley straw 3. Sorghum stalk
    3. Maize stalk 5. Wheat straw 6. Other (specify)
42. Do you grow fodder crops? 1. Yes 2. No
43. If yes, which fodder crops?
    1. Grass 2. Forage legume 3. Tree legume

44. What are your major reasons for not growing fodder crops?
    1. Insufficient land 2. Insufficient labor
    3. Insufficient inputs (seed, fertilizer, and cash)
    4. Insufficient draft animal power

5. Feed for animals is adequate 6. Insufficient information

45. Do you buy any feed supplements for your fattening cattle? 1. Yes 2. No

46. If yes, which feed supplements do you buy?

1. Oil seed cake 2. Cotton seed cake
3. Wheat and corn bran and middling

47. From where do you buy your supplement feeds?

1. From the farmers' association 2. From the ministry
3. From private retailers 4. From the industries

48. How much do you spend on feed per month?

1. 100-200 birr/month 2. 201-300 birr/month 3. >300 birr/month

49. What sources of water are you using for your fattening cattle?

1. Tape water 2. The nearby river
3. Pond 4. Walls

50. Do you usually transport the water or bring the animals to the rivers or pond?

1. Transport the water 2. Bringing the animals to the river or pond

51. If the answer to the question 60 is (1), How far the water points from your home _____ Kms.

52. How money time does you water fattens cattle?

1. Once per day 2. Twice per day
3. Three times per day 4. More than three times per day

62. What is your main water related problem?

1. Scarcity 2. Parasites such as leaches 3. Unhygienic

63. Do you have an experience of housing your fatten cattle? 1. Yes 2. No

64. If yes, how do you house fatten cattle?

1. Separate house constructed for cattle
2. 2. Separated room in family house
3. Enclosed barn with simple shed

5. Feed for animals is adequate 6. Insufficient information

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1. Separate house constructed for cattle
2. 2. Separated room in family house
3. Enclosed barn with simple shed

4. Tether in farmland or homestead

65. When do house them?

1. All the time 2. Only at night

66. How are you utilizing it most of the time?

1. I do not use it at all 2. Fuel
2. It is used for soil fertilization 4. It is used for construction purposes

67. What is your labor source in the fattening process?

1. Family labor 2. Hired labor 3. Both

68. Do you have any fattening cattle health problems? 1. Yes 2. No

69. If yes, what are the major fatten cattle health problems? Please rank in order of importance.

1._____
2._____
3._____
4._____

70. How many fatten cattle did you lose the last one-year because of diseases...

71. For whom do you sell your fattened animals?

1. Individuals/ group consumers 2. Cattle traders
3. Government institution 4.Butchers
5. To others

72. What criterion do you mostly use in selecting your fatten cattle marketing out let?

1. Price 2. Distance 3. Reliability
4. Long term contract

73. What was your marketing place for selling your fattening animals?

1. Farm gate 2. Local kebele market

3. Woreda town main market

74. How many Kms you went to sell your fattened animals? _____Km.

75. Which transport means are you using to transport your fatten cattle for sale most of the time?

1. Public transport 2. Traveling on foot

3. Using pack animals

76. Is there any period you have problem of marketing you fatten cattle? 1. Yes 2. No

77. If yes, which months

1. Fasting months 2. In any month in the year

78. What is the main constraint out of the following constraints for your Fatten cattle production?

1. Feed shortage
2. Lack of service (extension, input and veterinary)
3. Disease
4. Lack of genetic improvement
5. Market availability

9. SIGNED STATEMENT OF DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any University and that all sources of material used for the thesis have been duly acknowledged.

Name: Asmamaw Zafu: _____

Date of submission: June 2012.

This thesis has been submitted for examination with my approval as University advisor:

Dr. Ashenafi Mengistu: Ashenafi M.