

The Effect of Marketing System on Cattle Welfare in Mersa and Woldia Towns

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Abstract

Cattle welfare is hindered by several factors such as lack of feed, water, shelter, rest and comfortable transportation facilities; the aim of this study was to assess the effect of marketing system on cattle welfare. The majority age of respondents was range from 31-45 (47.5%) and the analysis for educational status disclosed that 45% of the respondents were illiterates and majority of households owned cattle in the range between 1-3 (42.5%) cattle. Most of the market actors in the study area were farmers which covered 47.5% and 45% of total sellers and buyers respectively. The majority of households owned cattle in the range between 1-3 (42.5%) cattle per head. About 72.5% of the respondents confirmed that price of cattle is set by negotiation between buyers and sellers. Abusive handling by stakeholders was the most frequently observed behavior (48% and 45%) at Mersa and Woldia markets respectively. Highest expressed abusive behaviors by stakeholders were beating of body by stick 45% and 48% at Mersa and Woldia markets respectively. The aggressive behavior of the animals due to human intervention at Woldia and Mersa accounts about 37% and 42% respectively. Transportation system of cattle in the study area was mostly by foot 96% and 94% in Mersa and Woldia respectively. Hunger and thrust was leading welfare problem whereas naturalness is not the main problem. Generally the welfare of cattle at markets was very poor and animal transport conditions are inadequate which implies awareness creation is vital.

Keywords: Behavior; Cattle; Mersa; Market; Welfare; Woldia

Introduction

Ethiopia is known for diversified agricultural activities [1]. Agriculture is the main economic backbone for Ethiopian economy since more than 80% of people in Ethiopia depend on agriculture and contributes to almost 40% of total GDP (Gross Domestic Product) (around 20% of this comes from livestock and their products). Ethiopia is the leading country in livestock population in Africa and ranked tenth from world [2].

Animal welfare is described generally in terms of comfortable interaction of animals with their environment and measured in terms of physiological, psychological and behavioural systems [3]. Animals that are transported by foot to the market often walk for days without adequate rest, water or feed. The drivers of animals in Ethiopia force them to move faster. By the time the animals reach at markets they are exhausted and their physical condition has greatly deteriorated [4]. In developing countries like Ethiopia, the main welfare concerns of animals are mainly, long distance journey, forcing animals to cross big rivers that have no bridge and journey without sufficient food, water and resting time [5]. Further Animals are also exposed to high radiation in summer and heavy rain in the winter. Animals are transported from farms to market or other places usually by walking or by inappropriate vehicles [6].

In Ethiopia there are no animal welfare regulations or any constitution that protects animals from suffering [7] so, animal welfare has been compromised due to different reasons including, breeding procedures and consequent difficulties, ill treatment, neglect accidentally or due to lack of knowledge, in adequacy in design of housing including pens. Inadequate management system or poor husbandry on the farm, poor conditions and procedures in the following conditions during moving or loading, during transport, at market or at slaughter house also affect cattle welfare [5,8].

Stakeholders at markets are handling cattle abusively. This type of handling is correlated with higher frequencies of aggressive, stress

related and resistance behaviours that animal express. In Ethiopia, the most common transport system of cattle to markets is by foot [3]. A high prevalence of dead and injured animals during transport is common depending on the type of transport and distance covered [8].

In Mersa and Woldia cattle markets, there are many cattle suppliers. There are also other market actors like traders, brokers, cattle trekkers and truckers. However, the market actors are not aware of animal welfare. In the same they have no any care for the welfare of animals rather they only focus on the marketing activity without considering economic importance of cattle welfare. Compromising cattle welfare at markets leads to the animals to high stress levels and to loss body condition up to injury and death, so these leads to higher economic loss for cattle producers and market actors as well as affects the economic growth of the country by reducing the contribution of livestock sector to the total GDP (Gross Domestic Product). Even though cattle needs feed, water, shelter, rest and comfortable transportation facilities market actors do not know how to manage and care their cattle during transportation and at markets. So far, no work has done on the effect of marketing system on cattle welfare in the study area. Therefore, this research was initiated to address this problem.

Therefore the objective of this study was

- To assess the effect of marketing system on cattle welfare in Mersa and Woldia towns.

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Materials and Methods

Description of the study area

This research was conducted in north Wollo Zone Mersa and Woldia town cattle markets in 2016/2017. Mersa is a town in north Wollo of the Amhara Region in Ethiopia. It has a latitude and longitude of 11°40'N 39°39.5'E, with an elevation of 1600 meters. The town is one of the larger areas in the Habru district. Mersa is located along Ethiopian Highway 2 [9]. Woldia is a hillside market town, capital of the north Wollo Zone, and woreda in northern Ethiopia. Located north of Dessie and southeast of Lalibela in the Amhara Region, this town has a latitude and longitude of 11°50'N 39°36'E and an elevation of 2112 meters above sea level [10].

Sample size and sampling technique

Simple random sampling was used to collect data using interviews, semi structured questionnaires and direct observation. Moreover, a total of 80 respondents (40 from Woldia and 40 from Mersa) who participate in cattle marketing were participate to know their opinion why they compromised cattle welfare in markets.

Data collection and source

Data was collected through interviews and questionnaires. Formal survey was conducted to study the effect of marketing system on cattle welfare in the study area by using questionnaire, interview and direct observations. Questionnaires were prepared to the respondents who were selected from cattle market actors. The interview was used to gather necessary information through asking questions and writing down the response of the respondents. On the other hand, direct observation was used by the researchers to obtain qualitative data. The researchers' personal observation and experience of the study helps to understand the effects of marketing system on cattle welfare in the study area. Two types of data sources, which are primary and secondary data was collected for this study. Primary data was obtained by direct observation, interview, and questionnaire on the cattle welfare in markets of the study area. Secondary data was collected from various books, similar research project papers, internet services and from documents of the towns' trade and transport office and also from trade and industry office of north Wollo zone. Both quantitative and qualitative data was gathered through direct observation, interview and questionnaire.

Data analysis

Data was analyzed by using Microsoft Excel computer program 2010 and descriptive statistics like tables, percentage, chart and figures were used to summarize information collected from a sample. Furthermore, comparison between cattle welfare problems based on their dangerousness was ranked. A simple descriptive statistical technique was applied for the effect of marketing system on cattle welfare. The data was organized, summarized and analyzed using different statistical method. The level of practical knowledge and some other relationship was analyzed. The result was interpreted and presented to share findings with the scientific community.

Results and Discussion

Socioeconomic characteristics of respondents

The household characteristics of respondents (Table 1) revealed that the proportion of female respondents were less than males in both towns. The majority age of respondents was range from 31-45 (47.5%), these age category is related with poor cattle welfare by market actors because in our study we found that respondents with this age category

teaser their cattle after the transaction ends and they drink alcohols but they give nothing for their cattle and thus the animals suffer different welfare problems up to night. The finding of Fufa et al. said that the largest proportion (82.8%) of the respondents was within the age group of 31-60 years [6]. The analysis for educational status disclosed that 45% of the respondents were illiterates. Reading and writing 30%, 12.5% had primary education and 12.5% of respondents had secondary education.

As indicated in Table 2 the majority of households owned cattle in the range between 1-3 (42.5%) cattle per head. These are destitute category households. These are closely followed by poor category households 40% and own 4-8 heads of cattle. About 7.5% of the respondents were categorized to medium with 10-30 heads of cattle. The rich and very rich households own cattle heads that range from 30-40 and >50 respectively with frequency observed 2.5% and 0% respectively mostly rich owners compromise welfare than poor ones because they (the former) are mostly enjoying more without any care for the animals than the later. Other study by Zekarias and Teshale, reported that the majority of households owned cattle in the range between 4-12 (45.29%) cattle per head [11]. These are poor category households. These are closely followed by medium category households 43% and own 13-43 heads of cattle. The rich and very rich households own cattle heads that range from 44-56 and 57-109 respectively. However, the proportion of these households is less than 3%.

Cattle marketing in the study area

The price setting activity of cattle in the study area was accomplished by various actors in the market. About 72.5% (Table 3) of the respondents confirmed that price of cattle is set by negotiation between buyers and sellers based on initial price given by sellers and final price from buyers. Lack of modern pricing like weighing affects animal welfare and we observed that above 70% of oxen forced to plough in frustrating place and time to test their ability as one pricing parameter. Some proportion of respondents recognized determination of price by brokers 15% and based on previous week market information 15%. This shows that market actors had different level of influence in the role they played for setting price. It is observed that every aspect of price setting mechanisms majorly was controlled by buyers and sellers.

Other study by Fufa et al. reported that the price setting activity of cattle in pastoralist area is known to be accomplished by various actors in the market [6]. According to the study about 62% of pastoralists confirmed that price of cattle is set by brokers based on initial price given by sellers and final price from buyers. The proportion of pastoralists recognized determination of price by buyers based on central market information, by brokers based on central area information and sellers by their own respectively is 22%, 10% and 6%.

As indicated in Table 3 the total cattle transactions, 47.5% have access to domestic market information where as 52.5% has no market information. So, most of them turn back their animals when the price is under their expectation and this highly compromise animal welfare. Along this, the result indicated that traders who have access to information about the domestic market paid (obtained) significantly lower prices than those who do not have any and the finding agrees with another study by Hailemariam et al. of the total cattle transactions, 66% were transacted by those who have no accesses to domestic market information [4]. The result indicated that traders who have access to information about the domestic market paid significantly lower prices in both shoat and cattle markets than those who do not have any.

From the samples 37.5% of the respondents said that the reason for

Variables		Towns				Total (N=80) percent
		Mersa (n=40)		Woldia (n=40)		
		Frequency	Percent	Frequency	Percent	
Sex of respondents	Male	30	75	32	80	77.5
	Female	10	25	8	20	22.5
Age of respondents(years)	15-30	6	15	6	15	15
	31-45	18	45	20	50	47.5
	46-60	12	30	10	25	27.5
	Above 60	4	10	4	10	10
Educational status of respondents	Illiterate	20	50	16	40	45
	Read & Write	12	30	12	30	30
	Elementary school	4	10	6	15	12.5
	High school	4	10	6	15	12.5

Table 1: Household characteristics.

Average owned		Wealth category		Towns				Total (N=80) percent
				Mersa (n=40)		Woldia (n=40)		
				Frequency	Percent	Frequency	Percent	
0	Very poor	4	10	2	5	7.5		
1-3	Destitute	20	50	14	35	42.5		
4-8	Poor	14	35	18	45	40		
10-30	Medium	2	5	4	10	7.5		
30-50	Rich	0	0	2	5	2.5		
>50	Very rich	0	0	0	0	0		

Table 2: Cattle ownership with respect to wealth classification.

selling their cattle is to cover house hold necessities followed by, income generation 32.5%, replace older stock 12.5%, cover health payment 7.5%, pay tax% 5 and cover school fee 5% (Table 3). In addition, cattle market used as input, capital, insurance and livelihood income base, social heritage capital, income source and livelihood base. Hailemariam et al. reported also, cattle marketing play a variety of roles for most rural people's livelihoods, particularly as insurance for disaster, income and livelihood base capital [4].

Most of the market actors in the study area were farmers Table 3 which covered 47.5% and 45% of total sellers and buyers respectively and they affect cattle welfare due to lack of awareness. Traders were the second contributors covered 27.5% of transaction activity, 12.5% of buyers were fatteners and they covered 17.5% of total sellers in the study area, 15% of buyers were butchers and hotel owners. Brokers also contributed as sellers about 7.5% (Table 3). The study by Zekarias and Teshale, also reported, market actors were producers, medium to large traders, middlemen/brokers, butchers, restaurant owners' farmers [11]. The study also fined that each actor has its own function.

As indicated above Table 4 the price of ox was range from 8000 Eth. Birr to 18000 Eth. Birr with average price 12,250 ETB per head. The average price of bull, cow, heifer and calf were 10500, 6500, 5250 and 3125 Eth. Birr per head respectively (Table 4). The finding disagreed from the study of DCA, which reported that the price of ox ranges from 2325 to 2850 Eth. Birr, cow 1425 to 1600 and heifers 975 to 1175 Eth. Birr [12].

The common cattle marketing channels in the study areas involve several marketing agents. During the weekly market day, producers supply cattle and sell them to traders or farmers and pastoralists. The producers often sell livestock directly to farmers or to traders. Sometimes brokers engage in the purchase of animals for resale. Regional buyers of oxen and cow collect animals from different agents and transport them to distant markets such as Mekele, Semera, Dessie and Addis Ababa by transporting cattle using vehicles. This also indicated by Harko,

producers sell cattle to other producers, consumer traders, urban dwellers and new comers from surrounding highlands who buy cattle for festival consumption [13].

Cattle behaviour and human intervention

Behavioral studies were conducted by direct observation. The result was divided into five categories: natural behaviors, abusive handling by stakeholders, aggressive, stress-related- and resistance behaviors and 40 cattle were observed when showing different behaviors. Of the five categories: abusive handling by stakeholders was the most frequently observed with frequency of 48% and 45% at Mersa and Woldia markets respectively. Natural behaviors observed at frequency of 28% and 30%, at Mersa and Woldia markets respectively followed by aggressive 10% and 12%, stress-related 8% and 6% and resistance behaviors 6% and 7% were observed at Mersa and Woldia markets respectively.

From behavioral observations at Woldia and Mersa markets, the highest expressed abusive behaviors by stakeholders were beating of body by stick 45% and 48%, beating of head 37% and 32% tail pulling 10% and 12%, pushing animal forward 6% and 5%, forcing animals to fall 2% and 3% at Woldia and Mersa respectively were observed. Antonia, reported that the most frequent behaviours expressed by humans were "beating of the body" at a frequency of 46% and "beating of the head" with a frequency of 34%. These two behaviours were observed at significantly high levels and differ from the rest of the abusive handling behaviours in observed occurrence. The third most observed abusive behaviour was "tail pulling," but is yet only expressed 10% and therefore differs 24% from "beating of the head".

Aggressiveness with frequency of 37% and 42% at Woldia and Mersa respectively was the most observed animal aggressive behavior due to human intervention followed by moving forward (31% and 28%), fighting (30% and 26%) at Woldia and Mersa respectively. Mounting that was recorded at markets was 2% and 4% at Woldia and Mersa respectively was the lowest expressed aggressive behavior. Josefine, reported that the highest expressed aggressive behavior was moving

Variables		Towns				Total (N=80) percent
		Mersa (n=40)		Woldia (n=40)		
		Freq.	Percent	Freq.	Percent	
Types of buyers	Fatteners	4	10	6	15	12.5
	Farmers	22	55	14	35	45
	Traders	10	25	12	30	27.5
	Hotels and butchers	4	10	8	20	15
Types of sellers	Farmers	22	55	16	40	47.5
	Traders	10	25	12	30	27.5
	Brokers	2	5	4	10	7.5
	Fatteners	6	15	8	20	17.5
Market information	Have information	16	40	22	55	47.5
	Not have information	24	60	18	45	52.5
Sources of market information	Brokers	8	20	10	25	22.5
	Tax collectors	6	15	4	10	12.5
	Relatives	8	20	12	30	25
	Previous information	18	45	14	35	40
Reasons of cattle purchase	For fattening	8	20	10	25	22.5
	For breeding	6	15	8	20	17.5
	For farming	18	45	14	35	40
	Other	8	20	8	20	20
Reasons of cattle selling	To cover HH necessities	16	40	14	35	37.5
	To pay tax	2	5	2	5	5
	To cover school fee	4	10	2	5	7.5
	To cover health	2	5	2	5	5
	To replace older stock	4	10	6	15	12.5
	To earn income	12	30	14	35	32.5
Price determination	Brokers	4	10	8	20	15
	Buyer and seller	30	75	28	70	72.5
	Previous week price	6	15	4	10	12.5
Reasons for price variation	Holidays	14	35	16	40	37.5
	Drought time	12	30	12	30	30
	Farming season	8	20	8	20	20
	Number of buyers and sellers available	6	15	4	10	12.5

Table 3: General information on cattle marketing in the study area.

forward (41%), fighting (29%) and aggressiveness (27%) [8]. The least expressed behaviors by animals' were jumping (3%), stretching and balking which never was observed. Within the resistance behavior group, different behaviors were significantly expressed but most common were resistance to being pulled (30%, 28%), refusing to leave their original place (25%, 32%), reversing (20%, 20%), charging at stakeholders (20%, 18%), slips slightly of 4%, 2% were recorded at Woldia and Mersa respectively. Josefine, reported that of the resistance behaviors, occurrences of each behavior varied greatly between markets but most common were resistance to being pulled, charging at stakeholders and falling down on ground [8].

The stress-related behavior that was observed at the highest extent at both markets was moving forward 32%. The other stress related behaviors include head swings 25%, vocalization 20%, foaming 15%, and paralyzed respiration 8% in average from the two markets. According to the study of Antonia 2013, of the stress-related behaviors, panting (10%), moving forward (8%), vocalizing (6%) and head swinging (6%) were the most frequently observed behaviors in markets. The behaviors paralyzed respiration, stamping of feet was never seen and idling, foaming and stretching were expressed at less than 2%. In both Woldia and Mersa markets cattle expressed natural behaviors and watching around was the most significant observed behavior, with a frequency of 40%. The animals also expressed the behaviors ear erect at

an incidence of 23%, vocalization at 16% and moving forward at 18%. However, the natural behavior ruminating was only observed at 3% in the both markets.

Other study by Josefine, reported that the natural behaviors that were highest expressed by animals were watching around, ear erecting, and eliminations. At market, rumination and ear erecting were more frequently observed and vocalization, turning and moving forward least observed.

Animal handling and transport

The transportation system of cattle in the study area was mostly by foot 96% and 94% in Mersa and Woldia respectively. The rest of transportation system was 4% and 6% in Mersa and Woldia respectively was by vehicles. Table 5 presents the recorded flow of animals from the vicinity of Woldia town. The cattle were brought from farms with average distance of 22.2 km, varying from 8 km to 40 km and they walked for 1 to 6 h.

During transport by foot to Woldia market, the animals were exposed to radiation; had no feed and water allowance. It was also observed that animals could be injured when forced to walk on asphalted road and the sharp gravel on the road which could injure animals' foot during long journey. Lameness and injury to bone, muscle, swelling of leg and sickness were widely seen during transportation by walking.

Types of cattle	Mersa			Woldia			Mean
	Minimum	Maximum	Average	Minimum	Maximum	Average	
Ox	8000	18000	13000	5000	18000	11500	12250
Bull	6000	15000	10500	5000	16000	10500	10500
Cow	4000	8000	6000	4000	10000	7000	6500
Heifer	3000	7000	5000	3000	8000	5500	5250
Calf	2000	4000	3000	2000	4500	3250	3125

Table 4: Price per head of cattle in Woldia and Mersa towns (ETB, Ethiopian Birr).

Animal category	No. of animals brought to market	Original place	Estimated distance, [Km]	Time taken for transport, [hr]
Farmer-1	2 oxen and 1 cow	Kalim	30	5
Farmer-2	1-ox	Sanka	25	4
Farmer-3	4-oxen	Girana	40	6
Farmer-4	3-oxen	Mersa	30	5
Farmer-5	2-cows	Dorogibir	12	2
Farmer-6	2-heifer	Gubarja	10	2
Farmer-7	2-oxen	Gedober	12	2
Farmer-8	6-bull	Woldiagebriel	8	1
Farmer-9	2-oxen	Kobo	40	6
Farmer-10	2-cows	Lemasolela	15	3

Table 5: Animals flow to Woldia market from different sources.

Five freedoms	Ranks based on severity	
	Mersa	Woldia
Hanger and thrust	1	1
Discomfort	2	2
Pain, injury and disease	4	3
Fear and distress	3	4
Naturalness	5	5

Table 6: Common cattle welfare problems at markets.

Possible reasons	Towns				Total (N=80) percent
	Mersa (n=40)		Woldia (n=40)		
	Freq.	Percent	Freq.	Percent	
Lack of awareness	20	50	14	35	42.5
Social and cultural problems	2	5	4	10	7.5
Carelessness	14	35	18	45	40
Economic problems	4	10	2	5	7.5
Others	0	0	2	5	2.5

Table 7: Reasons for poor welfare of cattle.

According to the report of Frimpong, the development of market infrastructure and market institution in the country is very important to reduce such economic loss in the animal supply chain [14]. During transport, as animals move from known to un-known environment, so better animal handling and logistics management are required to improve animal welfare.

Most cattle sources for Mersa and Woldia market are rural areas most of which have no asphalt road and about 75% of cattle owners said that lameness is the most common welfare problem due to long distance journey up to 40 Km on rocky roads for up to 6 h without provision of rest, food or water. About 70% of those rural cattle owners trek their animals by their own where as 20% of the owners trekked their cattle by rural trekkers who compromise welfare by beating the body 67%, beating head 18%, and tail pulling 10% and stoning 5%.

During transportation of cattle to markets and away from markets the most common welfare problems at both Woldia and Mersa are injury 30%; due to long distance journey inappropriate loading and unloading

and transportation facilities, hunger and thirst 25%; discomfort 18%; due to sun attack and rough road, fear and distress 15%; due to mixing of different animals, confusion by the new environment and vehicles, inappropriate transportation vehicles, and disease due to the combined effect of those problems 12%. The finding is not supported by other studies numerically.

Cattle welfare problems at markets

Due to different reasons the five freedoms were compromised at both Woldia and Mersa markets. To study those problems we used direct observations, semi structured questionnaire and interviews.

There is no any feed or water in markets, sun attack, lack of rest, disturbance by human and other animals, beating by owners, fighting each other, stony market place, lack of veterinary care, beating by owners, ploughing, mixing of animals, new environment, bad treatment by owners, separation from their companions, not allowed for mounting, no grazing, no suckling all these factors affect cattle welfare in the study area.

Hunger and thirst was leading welfare problem followed by discomfort, pain injury and disease and fear and distress whereas naturalness is not the main problem as animals has mostly freedom to mix with other companions (Table 6). FAWC (Farm Animal Welfare Committee) also reported that the welfare situation for animals at markets was not in accordance with the Five Freedoms [15]. The markets in Ethiopia do not allow animals to have freedom from discomfort, or pain, injuries or diseases, or fear and distress.

Reasons for poor welfare of cattle in the study area

Lack of awareness with a frequency of 42.5% is the primary reason for poor welfare conditions of cattle in the study area closely followed by carelessness 40% (Table 7). Economic problems 7.5%, social and cultural problems 7.5%, and other factors 2.5% also contribute for poor welfare conditions of cattle. Lack of marketing facilities were economic problems because due to lack of standard measurements for cattle oxen were forced to plough at markets to test their ability as the main marketing parameter. The study of Broom and Fraser, 2007 also reported those problems with different rank from this study as

economic problems 35%, lack of awareness 30%, carelessness 23%, social and cultural problems 7% and other factors 5%.

Conclusion and Recommendations

In the study area the concept, definition and importance of animal welfare is not well known by most cattle producers and market actors. Poor animal welfare is common in the study and lack of awareness was the primary reason closely followed by carelessness. Stakeholders at markets were handling animals abusively. Animals expressed different behaviours in markets due to human intervention: including natural behaviors, abusive handling by stakeholders, aggressive, stress-related and resistance behaviors. The animal welfare at markets in the study area was very poor and animal transport conditions are inadequate with above 95% of transportation system was by foot. The welfare of cattle in the study area was compromised by long distance journey and abusive handling. Therefore, trainings and awareness creation on cattle production, handling, marketing and transportation should be provided for the society engaged in cattle production. Moreover, relevant information for cattle producers and market actors should be provided.

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