Original Article

The Impact of Marketing System on Cattle Welfare in Dambi Dollo and Geba Robi Markets

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ABSTRACT

Cattle welfare is influenced by several factors, including Lack of food, water, shelter, rest, and convenient transportation. The purpose of this study was to assess the impact of marketing systems on cattle welfare. The study was conducted in D/Dollo and G/Robi towns in Kellem Wollega Zone, Ethiopia. During the study period, 60 respondents were selected randomly and data was collected through direct observation, interview, and semi-structured questionnaires. The majority age of respondents ranged from 31-45 (53.3%) and the analysis for educational status disclosed that 46.7% of the respondents were illiterates. Most of the market actors in the study area were farmers which covered 51.7% and 46.7% of total sellers and buyers, respectively. About 65% of the respondents confirmed that the 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 D/Dollo and G/Robi

markets, respectively. The highest expressed abusive behaviors by stakeholders were beating of the body by the stick at 45% and 48% at D/Dollo and G/Robi markets, respectively. The aggressive behavior of the animals due to human intervention at D/Dollo and G/Robi accounts for about 37% and 42%, respectively. The stress-related behavior that was observed at the highest extent in both markets was moving forward by 31% and 28 for D/Dollo and G/Robi, respectively. The transportation system of cattle in the study area was mostly by foot 100% in D/Dollo and G/Robi towns. Hunger and thrust were leading welfare problems whereas naturalness is not the main problem. Lack of awareness with a frequency of 45% is the primary reason for the poor welfare conditions of cattle in the study area. Generally, the animal welfare at markets in the study area was very poor and animal transport conditions are inadequate. According to our findings most of the welfare problems were caused by a lack of awareness and carelessness of stakeholders.

Keywords: Behaviour, Cattle, Dambi Dollo, Market, Welfare.

INTRODUCTION

Ethiopia is a country with the high level of diversity in agriculture (Stock and Gifford, 2013). Agriculture has played a central role in the economy over the years and contributes to almost 40% of total GDP (Gross Domestic Product) (around 20% of this comes from livestock and their products) (Mengistu, 2006). Ethiopia is the country with the highest livestock population in Africa at the end of the 20th century (Tilahun and Workalemahu, 2003 & Erega and Tsegaye, 2017). In developing countries like Ethiopia, animals are stressed due to long-distance journey, forcing animals to cross big rivers that have no bridge and journey without sufficient food, water, and resting time. In the summer and winter, severe rain and high radiation levels are also harmful to animals. Animals are typically moved by foot or inefficient vehicles from farms to markets or other locations. (Bulitta *et al.*, 2012). There are no laws governing animal welfare or a constitution that would shield animals from pain in Ethiopia (Antonia, 2013). Possible causes of cattle welfare problems include breeding procedures and consequent difficulties, ill-treatment, neglect accidentally or due to lack of knowledge, inadequacy in the design of housing including pens. Inadequate management systems or poor husbandry on the farm, poor conditions, and procedures in the following conditions during moving or loading, during transport, at the market, or slaughterhouse also affect cattle welfare (Broom and Fraser, 2007). Stakeholders at markets are handling cattle abusively. This type of handling is correlated with higher frequencies of aggressive, stress-related, and resistant behaviours that animals express. Cattle are most frequently transported to markets on foot. Depending on the mode of transport and distance travelled, a high percentage of animals dying or being harmed during transport is typical (Josefine, 2013; Erega and Tsegaye, 2017). There are many livestock suppliers in Geba Robi and Dambi Dollo

livestock markets. There are also other market participants, such as dealers, brokers, cattle dealers, and truck drivers. However, market participants are unaware of animal welfare. At the same time, they are indifferent to animal welfare and focus only on marketing efforts without considering the economic importance of cattle welfare. Compromising the welfare of cattle in the market leads to high levels of animal stress and physical deterioration, including injury and death, leading to and reducing greater economic losses for cattle producers and market participants. It also affects the economic growth of the country and affects the contribution of livestock. Sector's share of total GDP (Gross Domestic Product). Cattle need feed, water, shelter, rest, and convenient transportation, yet market participants do not know how to manage and care for their livestock in transit and at the market. This study is expected to provide valuable information on the impact of the marketing system on cattle welfare in the Geba Robi and Dambi Dollo markets. Researchers and organizations interested in working with cattle welfare activities in the study area may benefit from this study, and the study may be used by cattle producers and farmers, cattle traders and exporters and other cattle market participants may also benefit. Several advisory mechanisms and instruments for farmers are proposed to potential investors, governmental and non-governmental organizations, and policymakers interested in becoming actively involved in the production and marketing of livestock. Finally, this research also serves as a basis for generating knowledge among cattle market participants and farmers about cattle welfare issues in the market and the control measures needed to improve cattle welfare. So far, no work has been done on the impact of the marketing system on cattle welfare in the study area. Therefore, the objective of this research was to assess the impact of the marketing system on cattle welfare in the Dambi Dollo and Geba Robi markets.

MATERIALS AND METHODS
Description of the Study Area
This research was conducted in Kellem Wollega Zone Dambi Dollo and Geba Robi town cattle markets. Geba Robi is located 624 km from Addis Ababa and 28 km from Dambi Dollo to the East. The HHs of the Geba Robi town include 1978, of whom 1594 were men and 384 were women. The total population of this town includes 8300, of whom 3640 were men and 4660 were women; all of its population was rural dwellers. The Town Livestock population includes; cattle 3634, sheep 4783, goat 5678, mule 274, Horse 64, donkey 684and 9678 poultry. The soil types of Woreda include clay silt sand, loamy, and loamy silt soil. The vegetation of the study area is semi-evergreen forest: This forest is characterized by a range of mainly semi-deciduous tree and shrub species and grasses. The total lands of the town are 1936hectarewith; also, the climate condition is 750 mm-1200 mm rainfall and 25c°

maximum and 22c° minimum. The altitude of the land ranges from 1300-1500m.a.s.l. (KWZLAFO, 2017)

Dambi Dollo is one of the capital towns of the Kellem Wollega zone. Dambi Dollo is located 652 km from Addis Ababa to the West. The HHs of the Dambi Dollo town include _13846, of whom 11158 were men and 2688 were women. The total population of this town includes 58100, of whom 25480 were men and 32620 were women; some of its population was rural dwellers and other traders, government employees, and other lives. The Town Livestock population includes; cattle 29840, sheep 12960, goat 1760, mule 136, donkey 1416, and 269760 poultry. The soil types of Dambi Dollo town include clay silt sand loamy sand and loamy silt soil. The vegetation of the study area is semi-evergreen forest: This forest is characterized by a range of mainly semi-deciduous tree and shrub species and grasses. The climate condition is 500mm-900mm rainfall and 25c° maximum and 20c° minimum. The altitude of the land ranges from 701-2202 m.a.s.l. (KWZLAFO, 2017)

Sample Size and Sampling Technique

To determine the sample size of the study we consider time limitations and financial limitations and we used purposive sampling which was used for interviews and that represents the people of the study also semi-structured questionnaires were used when collecting data from respondents. The sample size was limited to 100 (50 from Geba Robi and 50 from Dambi Dollo) respondents who participate in cattle marketing and was interviewed to know their opinion on why they compromised cattle welfare in markets. The sample size was limited to 100 respondents due to time and economic limitations.

Data Collection and Source

Data were collected through interviews and semi-structured questionnaires. Through the use of questionnaires, interviews, and direct observations, a formal survey was carried out to examine the impact of the marketing system on the welfare of cattle in the research area. For the respondents who were chosen from the cattle market actor, questionnaires were produced. The interview was used to gather necessary information by 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' observation and experience of the study help to understand the effects of the marketing system on cattle welfare in the study area. Basically, two types of data sources which are primary and secondary data were collected for this study. Primary data were obtained by direct observation, interview, and questionnaire on cattle welfare in markets of the study area. Secondary data was collected from various books, similar research project papers, internet services, and from documents the towns' trade and transport office and also from the trade and industry office

Kellem Wollega Zone. Both quantitative and qualitative data were gathered through direct observation, interviews, and questionnaires.

Methods of Data Analysis

Descriptive statistics is one of the techniques which were used to summarize information collected from a sample. Survey data were analyzed in the form of tables, and percentages and by using descriptive statistics to explain the characteristics of respondents. Furthermore, compression between cattle welfare problems based on their dangerousness was ranked. Simple descriptive statistical techniques were applied to the effect of the marketing system on cattle welfare. The data were organized, summarized, and analyzed using different statistical method**s.** The results were interpreted and presented for sharing results with the scientific community.

RESULT AND DISCUSSION

Socio-Economic Characteristics of Respondents

The household characteristics of respondents (Table 1) revealed that the proportion of female respondents was less than males in two towns. The majority age of respondents ranged from 31-45 (53.3%) this age category is related to poor cattle welfare by market actors because in our study we found that respondents with this age category teased 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 the night. The current finding agreed with the report of Bulitta *et al*., (2012) reported that the largest proportion (82.8%) of the respondents was within the age group of 31 -60 years. The analysis for educational status disclosed that 46.65% of the respondents were illiterate. Reading & writing 23.35%, 15% had primary education and 15% of respondents had secondary education.

Table 1: Household Characteristics

Variables		Towns				Total (N=60) percent
		D/Dollo (n=30)		G/Robi (n=30)		
		Freq.	Percent	Freq.	Percent	
Sex of respondents	Male	20	66.7	22	73.3	70
	Female	10	33.3	8	26.7	30
Age of respondents (years)	15-30	8	26.7	8	26.7	26.7
	31-45	15	50	17	56.7	53.3
	46-60	4	13.3	4	13.3	13.3
	Above 60	3	10	1	3.3	6.7
Educational status of respondents	Illiterate	15	50	13	43.3	46.7
	Read &write	6	20	8	26.7	23.3
	1-8	4	13.3	5	16.7	15
	9-12	5	16.7	4	13.3	15

D/Dollo= Dambi Dollo, Freq=frequency

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 65% (Table 2) of the respondents confirmed that the price of cattle is set by negotiation between buyers and sellers based on the initial price given by sellers and the final price from buyers.

Table 2: General information on cattle marketing in the study area

Variables		Towns				Total (N=60) percent
		D/Dollo (n=30)		G/Robi (n=30)		
		Freq.	Percent	Freq.	Percent	
Types of buyers	Fatteners	3	10	4	13.3	11.7
	Farmers	16	53.3	12	40	46.7
	Traders	8	26.7	9	30	28.3
	Hotels and butchers	3	10	5	16.7	13.3
Types of sellers	Farmers	17	56.7	14	46.7	51.7
	Traders	9	30	10	33.3	31.7
	Brokers	1	3.3	2	6.7	5
	Fatteners	3	10	4	13.3	11.7
Market information	Have information	12	40	17	56.7	48.3
	Not have information	16	60	13	43.3	51.7
Sources of market information	Brokers	5	16.7	6	20	18.3
	Tax collectors	4	13.3	3	10	11.7
	Relatives	5	16.7	7	23.3	20
	Previous information	16	53.3	14	46.7	50
Reasons of cattle purchase	For fattening	5	16.7	6	20	18.35
	For breeding	4	13.3	5	16.7	15
	For farming	16	53.3	13	43.3	48.3
	Holiday	5	16.7	5	16.7	16.7
Reasons of cattle selling	To cover HH necessities	13	43.3	10	33.3	38.3
	To pay tax	2	6.7	2	6.7	6.7
	To cover school fee	3	10	2	6.7	8.3
	To cover health	2	6.7	2	6.7	6.7
	To replace older stock	3	10	4	13.3	11.7
	To earn income	7	23.3	10	33.3	28.3
Price determination	Brokers	4	13.3	7	23.3	18.3
	Buyer and seller	20	66.7	19	63.3	65
	Previous week price	6	20	4	13.3	16.7
Reasons for price variation	Holidays	10	33.3	12	40	36.7
	Drought time	9	30	9	30	30
	Farming season	6	20	6	20	20
	Number of buyers and sellers available	5	16.7	3	10	13.3

Lack of modern pricing like weighing affects animal welfare and we observed that above 70% of oxen were forced to plow in frustrating places and time to test their ability as one pricing parameter. Some proportion of respondents recognized the determination of price by brokers as 18.3% and based on the previous week's market information 16.7%. This shows that market actors had different levels of influence in the role they played in setting prices. It is observed that every aspect of price-setting mechanisms majorly was controlled by buyers and sellers. Other studies by Bulitta *et al.,* (2012) reported that the price-setting activity of cattle in pastoralist area is known to be accomplished by various actors in the market. As indicated in (Table 2) of the total cattle transactions, 48.3% have access to domestic market information whereas 51.7% have no market information. So, most of them turn back their animals when the price is under their expectation, and this highly compromises animal welfare. From the samples, 38.3% of the respondents said that the reason for selling their cattle is to cover household necessities followed by, income generation 28.3%, replacing older stock 11.7%, covering health payments 6.7%, paying tax 6.7% and cover school fee 8.3% (Table 2). In addition, the cattle market is used as input, capital, insurance and livelihood income base, social heritage capital, income source, and livelihood base. The current finding agreed with the report of Haile-Mariam *et al.,* (2010). Also, cattle marketing plays a variety of roles for most rural people's livelihoods, particularly as insurance for disaster, income, and livelihood base capital. The majority of the respondent in the study area were 46.7% farmers buying cattle from the market. Traders were the second contributors covering 28.3% of transaction activity, 11.7% of buyers were fatteners and they covered 11.7% of total sellers in the study area, 13.3% of buyers were butchers and hotel owners. Brokers also contributed as sellers about 5%. The study by Bassa and Woldeamanuel (2015) also reported, market actors were producers, medium to large traders, middlemen/brokers, butchers, restaurant owners' and farmers.

Price of Cattle in D/Dollo and G/Robi Towns

As indicated below (Table 3) the price of an ox was range from 8000 ETB to 18000 ETB with an average price of 12,250 ETB per head. The average price of bull, cow, heifer, and calf were 10500, 6500, 5250, and 3125 ETB per head, respectively (Table 3). The finding disagreed with the study of DCA, 2008 which reported that the price of ox ranges from 2325 to 2850 ETB, cow1425 to 1600, and heifers 975 to 1175 ETB. 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 and farmers**.** The producers often sell livestock directly to farmers or traders. Sometimes brokers engage in the purchase of animals for resale. Regional buyers of oxen and cows collect animals from different agents and transport them to distant markets such as Gembella, Nekemte, Ambo, and Addis Ababa by transporting cattle

using vehicles. This is also indicated by Harko (2015) producers sell cattle to other producers, consumer traders, urban dwellers, and newcomers from surrounding highlands who buy cattle for festival consumption.

Table 3: Price per head of cattle in D/Dollo and G/Robi towns (Ethiopia Birr)

Types of cattle	D/Dollo			G/Robi			Average total
	Min	Max	Average	Min	Max	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

Cattle Behaviour and Human Intervention

Behavioral studies were conducted by direct observation. The result was divided into five categories (Figure 1) 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 a frequency of 48% and 45% at the D/Dollo and G/Robi markets, respectively. Natural behaviors observed at a frequency of 28% and 30%, at D/Dollo and G/Robi markets, respectively followed by aggressive 10% and 12%, stress-related 8% and 6%, and resistance behaviors at 6% and 7% were observed at D/Dollo and G/Robi markets, respectively (Figure 1).
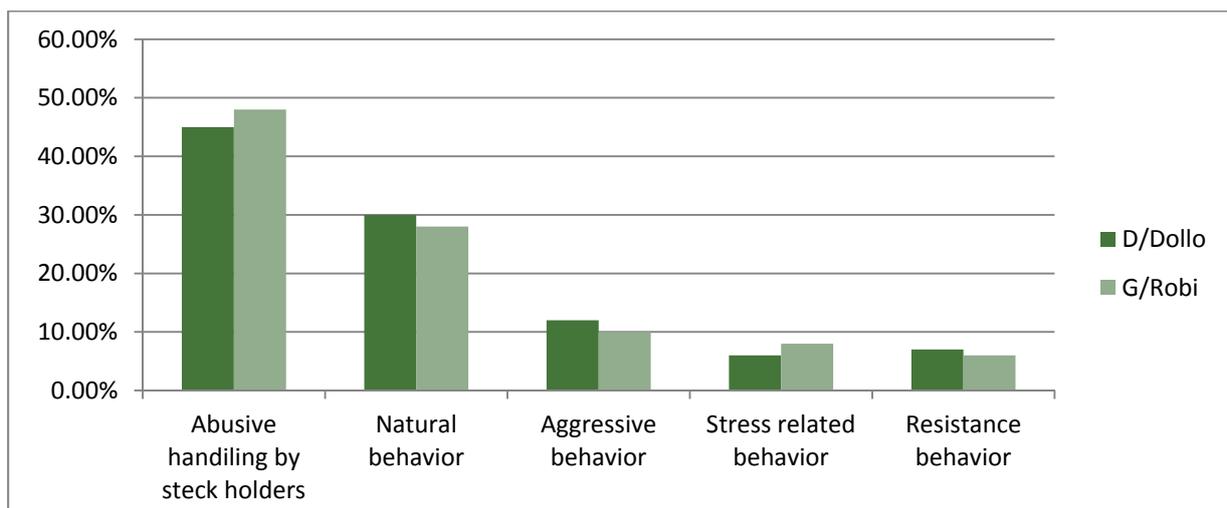

Figure 1: Frequencies of animal behaviors at D/Dollo and G/Robi markets

Abusive Handling by Stockholders

From behavioral observations at D/Dollo and G/Robi markets, the highest expressed abusive behaviors by stakeholders were beating of the body by stick at 45% and 48%, beating of the head at 37% and 32%, tail pulling at 10% and 12%, pushing animal

forward 6% and 5%, forcing animals to fall 2% and 3% at D/Dollo and G/Robi, respectively were observed (Figure 2). Antonia (2013) reported that the most frequent behaviors expressed by humans were "beating of the body" at a frequency of 46% and "beating of the head" at a frequency of 34%. These two behaviors were observed at significantly high levels and differ from the rest of the abusive handling behaviors in observed occurrence. The third most observed abusive behavior was "tail pulling," but is yet only expressed 10% and therefore differs by 12% from "beating of the head".
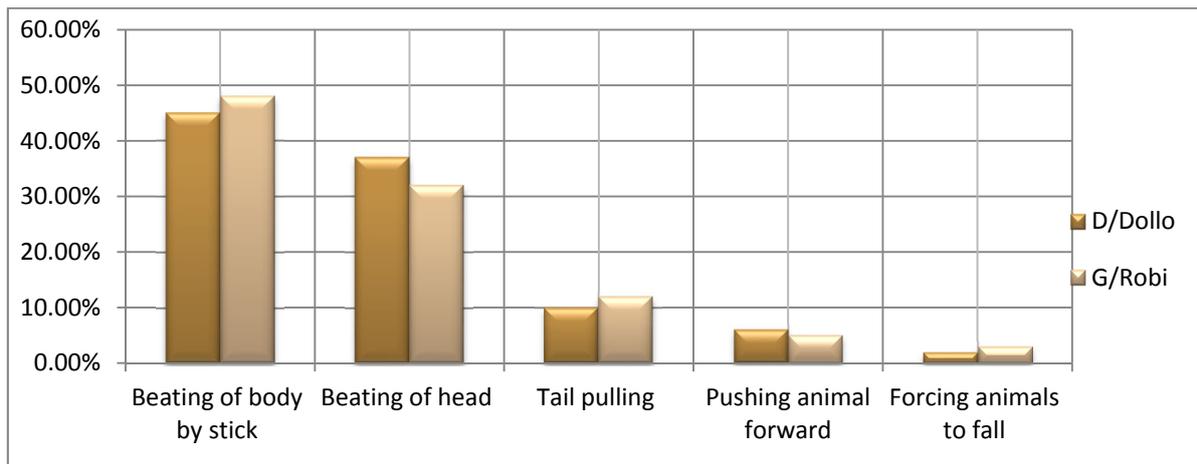
Figure 2: Frequency of abusive handling by stockholders at D/Dollo and G/Robi markets

**Aggressive Behavior of Cattle**

Aggressiveness with frequency of 37% and 42% at D/Dollo and G/Robi towns, respectively was the most observed animal aggressive behavior due to human intervention followed by moving forward (31% and 28%), fighting (30% and 26%) at D/Dollo and G/Robi, respectively (Figure 3). Mounting that was recorded at markets was 2% and 4% at D/Dollo and G/Robi, respectively was the lowest expressed aggressive behavior.
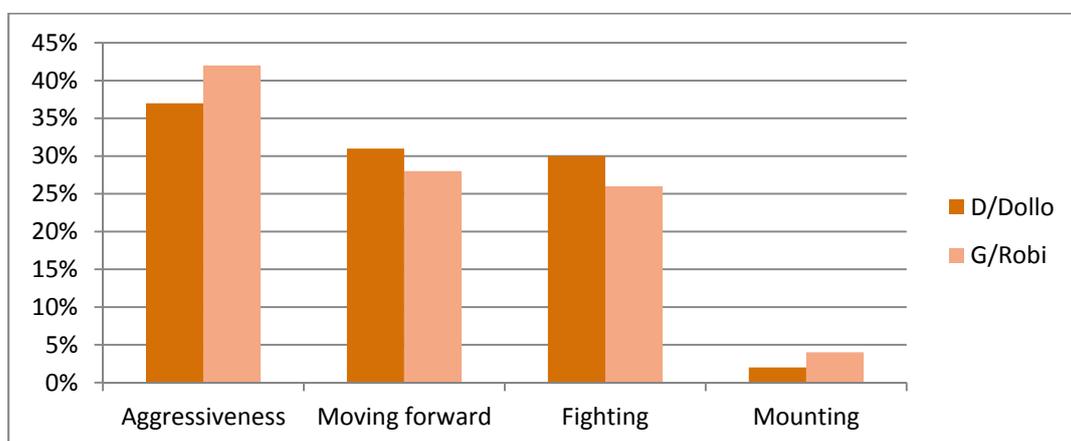
Figure 3: Frequency of aggressive behavior at D/Dollo and G/Robi markets

Resistance Behavior of Cattle

Within the resistance behavior group, different behaviors were significantly expressed but the 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 D/Dollo and G/Robi, respectively (Figure 4). Josefin, 2013 reported that of the resistance behaviors, occurrences of each behavior varied greatly between markets but the most common were resistance to being pulled, charging at stakeholders, and falling on the ground.
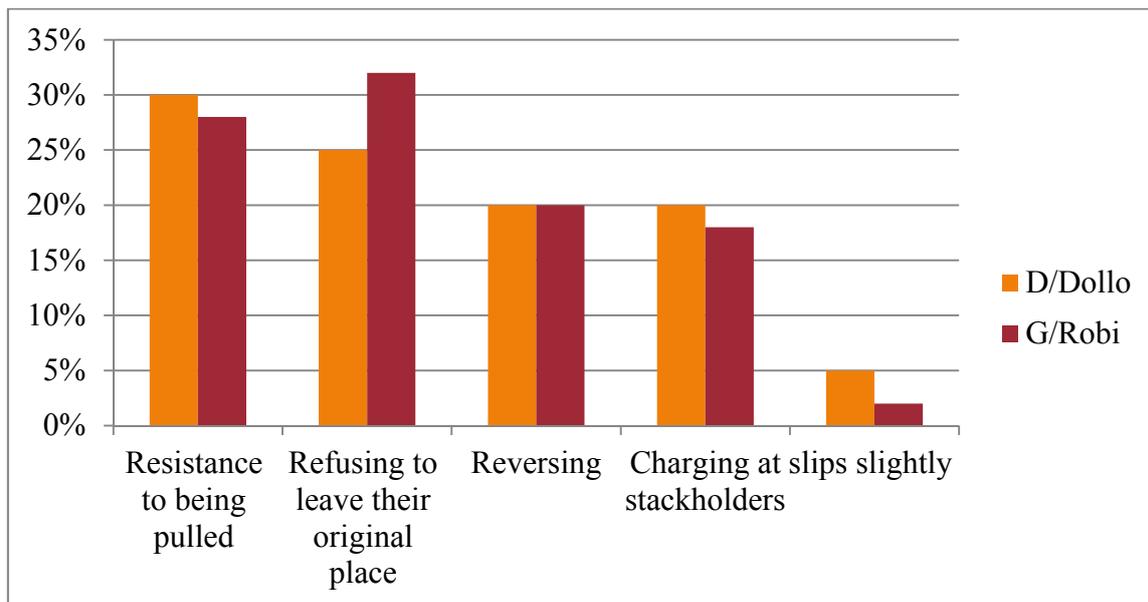
Figure 4: Frequency of resistance behavior at D/Dollo and G/Robi markets

The stress-related behavior that was observed at the highest extent in both markets was moving forward by 32%. The other stress-related behaviors include head swings 25%, vocalization 20%, foaming 15%, and paralyzed respiration 8% on average from the two markets. According to the study of Antonia 2013, the stress-related behaviors, panting (10%), moving forward (8%), vocalizing (6%), and head swinging (6%) were the most frequently observed in markets. The behaviors of paralyzed respiration and stamping of feet were never seen and idling, foaming, and stretching was expressed at less than 2%. In both D/Dollo and G/Robi 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 of ear erect at an incidence of 23%, vocalization at 16%, and moving forward at 18%. However, the natural behavior of ruminating was only observed at 3% in both markets. Other studies by Josefine (2013) reported that the natural behaviors that were highest expressed by animals were watching around, ear erecting, and eliminations. At the market, rumination and ear erecting were more frequently observed and vocalization, turning, and moving forward were least observed.

Animal Handling and Transport

The transportation system of cattle in the study area was almost by foot 100% and 100% in D/Dollo and G/Robi, respectively. All respondents in the study area were not used vehicles for the transportation system in both marketing areas. Table 4 presents the recorded flow of animals from the vicinity of D/Dollo town. The cattle were brought from farms with an average distance of 18.7 km, varying from 5 km to 45 km and they walked for 1 to 7 hrs.

During transport by foot to the D/Dollo market, the animals were exposed to radiation; had no feed and water allowance. Additionally, it was noted that animals could suffer harm if made to travel on asphalted roads, and that long distances on roads with jagged gravel could harm the feet of animals. When moving on foot, lameness, injuries to the bone and muscles, leg swelling, and illness were frequently observed. The development of market institutions and market infrastructure in the nation is crucial to reducing such financial losses in the animal supply chain, according to Frimpong (2009). To increase animal welfare, greater animal handling and logistics management are needed when moving animals from familiar to unfamiliar surroundings.

Table 4: Animals flow to the D/Dollo market from different sources

| 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	Minko	6	1
Farmer-2	1-ox	Yesusi	6	1
Farmer-3	4-oxen	Botoso	15	3
Farmer-4	3-oxen	Sayo	5	1
Farmer-5	2-cows	Keto	30	3
Farmer-6	2-heifer	Chanka	45	7
Farmer-7	2-oxen	mechara	30	6
Farmer-8	6-bull	Yebalo	20	3
Farmer-9	2-oxen	Arere	25	3
Farmer-10	2-cows	Biftu	5	1

Abusive Treatments of Cattle by Stakeholders

Most cattle sources for D/Dollo and G/Robi markets are rural areas most of which have no asphalt road and about 65% of cattle owners said that lameness is the most common welfare problem due to long-distance journeys up to 45 Km on rocky roads for up to 7 hours without provision of rest, food or water. About 60% of those rural cattle owners trek their animals on their own where as 30% of the owners trekked their cattle by rural trekkers who compromise welfare by beating the body 67%, beating the head 18%, and tail pulling 10% and stoning 5%.
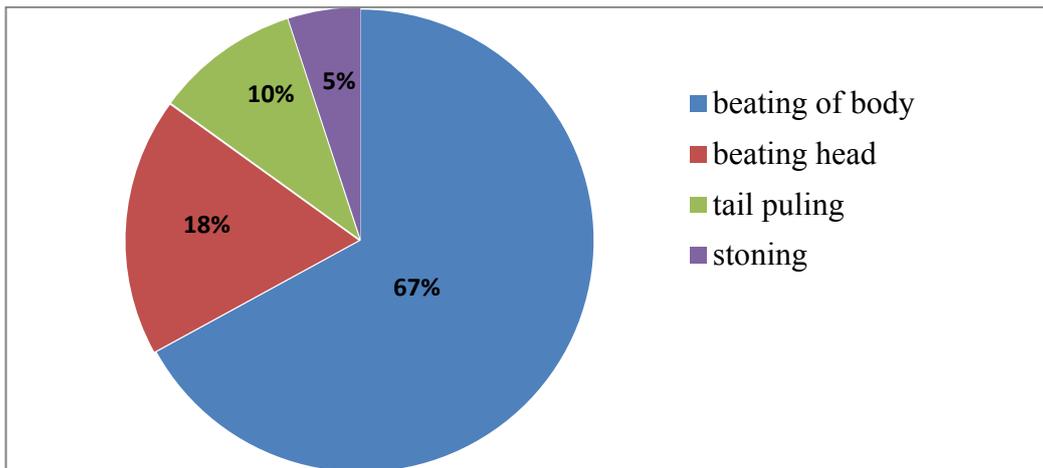
Figure 5: Abusive treatments of cattle by stakeholders when they are transported by foot

Welfare Problems During Transportation

During the transportation of cattle to markets and away from markets the most common welfare problems at both D/Dollo and G/Robi are injury 35%; due to long-distance journeys inappropriate loading and unloading and transportation facilities, hunger and thrust 23%; discomfort 15%; due to sun attack and rough road, fear and distress 13%; due to mixing of different animals, confusion by the new environment and vehicles, inappropriate vehicles, and disease due to the combined effect of those problems 8%.
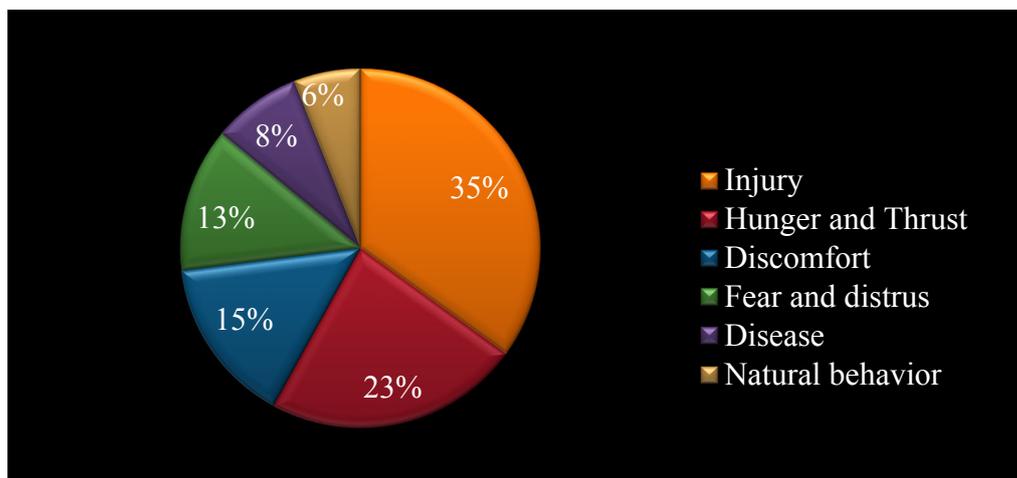
Figure 6: Welfare problems during transportation

Cattle Welfare Problems at Markets

Due to different reasons, the five freedoms were compromised at D/Dollo and G/Robi markets. To study those problems we used direct observations, semi-structured questionnaires, and interviews. There is no feed or water in markets, sun attacks, lack of rest, disturbance by humans and other animals, beating by owners, fighting each

other, stony marketplace, lack of veterinary care, beating by owners, plowing, 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 thrust were leading welfare problems followed by discomfort, pain injury and disease, and fear and distress whereas naturalness is not the main problem as animals have mostly freedom to mix with other companions (Table 5). Farm Animal Welfare Committee (FAWC) (2011) also reported that the welfare situation for animals at markets was not following the Five Freedoms. The markets in Ethiopia do not allow animals to have freedom from discomfort, pain, injuries or diseases, or fear and distress.

Table 5: Common cattle welfare problems at markets

Five freedoms	Ranks based on the severity	
	D/Dollo	G/Robi
Hanger and thrust	1	1
Discomfort	2	2
Pain, injury and disease	4	3
Fear and distress	3	4
Naturalness	5	5

Reasons for Poor Welfare of Cattle

Lack of awareness with a frequency of 45% is the primary reason for the poor welfare conditions of cattle in the study area closely followed by carelessness at 43.3% (Table 6). Economic problems 5%, social and cultural problems 5%, and other factors 1.7% also contribute to the poor welfare conditions of cattle. Lacks of marketing facilities were economic problem because due to the lack of standard measurements cattle oxen were forced to plough at markets to test their ability as the main marketing parameter. The study by Broom and Fraser, 2007 also reported those problems with different ranks from this study as economic problems 35%, lack of awareness 30%, carelessness 23%, social and cultural problems 7%, and other factors 5%.

Table 6: Reasons for Poor Welfare of Cattle

Possible reasons	Town				Total (N=60) percent
	D/Dollo (n=30)		G/Robi (n=30)		
	Freq.	Percent	Freq.	Percent	
Lack of awareness	16	53.3	11	36.7	45
Social and cultural problems	1	3.3	2	6.7	5
Carelessness	11	36.7	15	50	43.3
Economic problems	2	6.7	1	3.3	5
Other	0	0	1	3.3	1.7

CONCLUSION

In the study area, the concept, definition, and importance of animal welfare are 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 resistant behaviors. The animal welfare at markets in the study area was very poor and animal transport conditions are inadequate with above 100% of the transportation system being by foot. The welfare of cattle in the study area was compromised by long-distance journeys and abusive handling.

RECOMMENDATION

Training and awareness-raising activities on cattle production, handling, marketing, and transportation should be provided to communities involved in cattle production. Relevant information on definitions, concepts, benefits, and principles of animal welfare should be provided to cattle producers and market participants in the study area. Further investigation should be performed by including hormone measurements to measure welfare and calculating correlation coefficients for the relationship between animal behavior and human interventions.

DATA AVAILABILITY

The data used to support the findings of this study are available from the first author and corresponding author until request.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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