

A Review on Effect of Transportation and Handling on Meat Quality and Animal Welfare of Sheep in Ethiopia

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Abstract

Stressful routines for animal handling can reduce immune function and productivity of animals. In May developing country including Ethiopia sheep is transported by the land /rood and also sheep is subjected to walked during hot time of the day, they transport whole the day. Poor transportation can have serious deleterious effects on the welfare of sheep and can lead to significant loss of quality and production. In Ethiopia, there are no legislations to protect animals from suffering or discomfort. Therefore the objective of this review paper was to investigate Effect of transportation and handling on meat quality and animal welfare of sheep in Ethiopia The Consequences of poor sheep transport are Physical injury will cause loss of meat quality and subsequent rejection, the main forms of injury are bruising - bruising is the most serious and significant production loss as bruised, off-color meat must be wasted , Trampling - this occurs when animals fall down due to slippery floors or overcrowding. Sheep may also suffocate as a result and even die if not helped. Suggested improvements for the future are education of stakeholders, establishment of animal welfare regulations, and use of appropriate vehicles when transporting sheep and lastly to make sure that sheep's will get feed, water and rest during transportation.

Keywords: Ethiopia, animal welfare, sheep transport, animal handling, sheep, meat quality.

1. INTRODUCTION

1.1 Background

Ethiopia is a country with high level of diversity in the agriculture (Stock & Gonzalez, 2013). And has one of the biggest livestock populations in Africa (Masiga & Munyua, 2005). And also the country has 25.5 million sheep (CSA, 2013). In fact, the fast development of the economics has been highly dependent on agriculture resources (Mengistu, 2006). Although the country is developing and the economic condition improving, animal welfare is a subject that so far has not gained much attention. At present, there are no implemented legislations that protect animals from cruel actions by humans. However, there are a few organizations that work for animals' situation but they mainly focus on homeless and/or injured animals (Bekele, 2009). This is therefore an important first step to take in order to regulate how animals are managed and handled (Masiga & Munyua, 2005).

Animal handling is an important subject since it affects not only animals' emotional states but also economics due to fact that abusive handling can, or most likely will, result in lowered production (Price, 2008). In Ethiopia, handling of animals is usually aversive (Bulitta *et al.*, 2012) and therefore in conflict with animal welfare. If animals fail to cope with environmental stressors, it is likely that they will express chronic stress. The transport and handling of animals are an important component in the meat production system, and the associated questions regarding animal welfare and environment are a concern for society as a whole (Ljungberg *et al.*, 2007). From the animal's point of view, transport to slaughter can also be quite complex since they are exposed to a variety of potential stressors including shifts in temperature, air quality, vibration, and noise (Lewis, 2008; Jones *et al.*, 2010).

In some developing countries sheep walk long distance to slaughter and others can be transported in open vehicles in less than optimal conditions (Jibat *et al.*, 2008). Thus, the transports of sheep for meat production in Ethiopia are currently mostly done by foot (trekking) or in best cases by vehicle, mostly during long distances (Gebremedhim, 2007). This results in long distance journeys with no sufficient food or water and minimal rest, factors that cause severe stress to the animals (Bulitta *et al.*, 2012). Therefore the objective of this review paper was to investigate Effect of transportation and handling on meat quality and animal welfare of sheep in Ethiopia.

2. REVIEW

2.1 ANIMAL TRANSPORT IN ETHIOPIA

The most common way of transporting animals in Africa is by foot since there is a great lack of vehicles with sufficient capacity (Masiga & Munyua, 2005). Walking animals by foot often leads to injured, dead or stolen animals, which were investigated by Bulitta *et al.* (2012) who found that 7.6% of animals died, 6-9% got injured and 2.8% were stolen. Furthermore, he found that lameness and injuries such as swelling of legs commonly occur. This has also been proven to be a problem when animals are transported by vehicle (Masiga & Munyua, 2005). And also alludes to the problems which accompany a lack of rest, water and feed.

Almost all livestock in Ethiopia are transported by people on foot. In rare cases during longer distances vehicles are used, but usually not preferred since trekking is cheaper than transporting the animals with vehicles. It can vary as much as between 16 ETB/animal for trekking or 60-80 ETB/animal for vehicles for a distance of 200 km (Gebremedhim, 2007).

2.1.2 SHEEP TRANSPORT

In an attempt to minimize the effects of transport as a stressor of livestock (CEC, 1984), the European Commission proposed new regulations for international transport of farmed animals intended for slaughter. Recently evaluated those proposed EC regulations for requirement of “rest stops” every 8 hr during transport using slaughter lambs and suggested that “Rest stops” benefited the lambs mainly by reducing the observable effects of food deprivation (Krawczl *et al.*, 2004). Thus likewise other livestock the majority of sheep is transported by foot and there is no regulations that protect sheep from cruel action of human and sheep is transported without accessibility of Feed, water and rest during transportation Josefine (2013). And the consequence is bruising and lesions can be scored in order to downgrade carcasses, and meat quality problems such as dark, firm, dry (DFD) meat can be detected (EFSA, 2004).

2.1.3 PROBLEMS OF SHEEP TRANSPORT AND TREKKING IN ETHIOPIA

Until recently, there were no laws or guidelines governing animal transport. Now, the Ministry of Agriculture and Rural Development (MoARD) has issued guidelines on animal transport. However, implementation and enforcement of the guidelines is lacking. Absence of rules and regulations that prohibit transporting animals by ordinary trucks coupled with the shortage of dedicated animal transportation vehicles has encouraged animal transporters, live animal traders and exporters to continue the use of ordinary trucks. Lack of awareness on the extent of losses incurred during transport by producers, transporters, etc. has delayed action to curb the problem. Types of vehicles used: In most instances, ordinary trucks (non-livestock transport vehicles) not convenient for loading and unloading as well as transporting animals are used. In most instances, animals on these trucks are moved long distances without rest, feed and water until they arrive at their destination. These trucks are not suitable for easy offloading of animals for rest, feed, water and veterinary services and for subsequent reloading (ESGPIP, 2010).

2.1.4 EFFECTS OF TRANSPORT ON SHEEP

Transportation by its nature is unfamiliar and threatening event in the life of domestic animals. During transport, animals are exposed to various environmental factors such as heat, cold, humidity, noise, motion, overcrowding (Bratesh, 2002). Poor transportation can have serious deleterious effects on the welfare of sheep and can lead to significant loss of quality and production. Effects of transport and movement are like Stress, Trampling, Bloat and Dehydration occur when sheep subject to long distance travel without proper watering will suffer weight loss and may die (FAO, 2016).

2.1.5. APPROPRIATE SHEEP TRANSPORT

Trekking: Trekking will remain the main transport mode for the immediate and medium term future, the following are some of the point that can be implemented to minimize losses during and as a result of trekking sheep the journey should be planned, paying attention to the distance to be traveled, opportunities for grazing, watering and overnight rest. The sheep should be trekked during the cooler times of the day and arrive with sufficient time to be rested and watered before loading onto vehicles. The recommended maximum trekking distances for sheep should not exceed 24km/day. The distance they travel should not exceed 16km/day for subsequent days. Improvements in holding facilities for watering, feeding and rest along the trek routes will reduce weight and mortality losses ESGPIP (2010). The maximum distances that these animals should be trekked depend on various factors such as weather, body condition, age etc., but the distance given in Table 2 should not be exceeded when trekked (FAO, 2010).

Table 1: Maximum distances for trekking

Species	One day journey	More than one day	
		First day	Subsequent days
Cattle	30 km	24 km	22 km
Sheep/goats	24 km	24 km	16 km

Source FAO, 2010

Transporting sheep using vehicles: Ideally, sheep should be transported using trucks manufactured for livestock transport. It is, however, not feasible to transport all sheep using such vehicles in the near term. Ordinary trucks can be modified to serve the purpose Requirements for a vehicle for sheep transport (FAO, 2010). The following conditions should be fulfilled by both dedicated and modified vehicles used for the transport of sheep: Ventilation: In order to provide adequate ventilation, animal transport vehicles should never be totally enclosed. The free flow of air at floor level is important to facilitate removal of ammonia from urine and exhaust fumes in road vehicles that may cause poisoning. Poor ventilation can cause undue stress, poisoning and suffocation especially under warm weather conditions. Sheep are particularly susceptible to problems from poor ventilation and often die in route ESGPIP (2010).

Table 2: Recommended floor space allowance guide for sheep of different body weights and physiological states

Category	Approximate weight (kg)	Area (m ² /animal)
Weight category	<20	0.14
	<35	0.20 – 0.30
	35 – 55	0.30 – 0.40
	>55	0.40 – 0.75
Heavily sheep	<55	0.40-0.50
	>55	>0.50

Source ESGPIP, 2010

2.3. MEAT AND MEAT QUALITY OF SHEEP

Ethiopia is home to 25.5 million sheep and meat production is the most important function of these animals in the country (CSA, 2013). There is high demand for live animals as well as meat from small ruminants by consumers in the Middle East and North and West African countries. The proximity of Ethiopia to consumers in Middle Eastern countries and their taste preference

for our indigenous animals are advantageous for the Ethiopian meat export market. Meat is the most important source of animal protein for the human diet (Lawrie, 2005; McAfee *et al.*, 2010). Thus, Meat should be clean and free from diseases. Previous studies by (Jibat *et al.*, 2008). Found that there was a significantly high amount of rejected carcasses at HELMEX abattoir, Debra Zeit. Out of 2688 sheep and goats, 50.1% livers and 42.9% lungs were prohibited from international markets major due to parasites and pneumonia. The main factors causing this were animals transported on foot with no or less food/water and in open, overcrowded vehicles another study, done by Woube (2008) Resulted in 76.8% of livers and 61.6% of lungs rejected, mostly due to of parasites and damage during slaughter. According to The World Organization of Animal Health, OIE, the veterinary service of the exporting country has ultimate responsibility for certification of slaughtered animals (Thomson *et al.*, 2004; Antonia, 2013).

2.3.1. ANIMAL HANDLING IN ETHIOPIA

The handling of animals in developing countries has been a subject for critical discussion for a long time and is in need of further research. A recent study indicated that stakeholders in Ethiopia handle animals in an aversive way, which has been shown to increase prevalence of death and injuries (Bulitta *et al.*, 2012). By measuring behavioral or physiological conditions, animal handling can be explained to a higher extent and a welfare concept implemented (The Scientific Committee on Animal Health and Animal Welfare, 2002).

2.3.2. ANIMAL WELFARE

Animal welfare is a worldwide issue that is under more focus now than ever before. The western countries outline strict animal welfare regulations and organizations are fighting for animals' rights in a society where economics is often deemed the most important factor. In Ethiopia there are no animal welfare regulations or any constitution that protects animals from suffering for many years. However, there are six or seven organizations that work for animals' welfare, and the first was established as early as 1954. Still they have not yet accomplished the main objectives of their work to implement animal welfare, but it is under progress and hopefully ready within near future (Bekele, 2009; Josefine, 2013).

3. CONCLUSION

In May developing country including Ethiopia sheep is transported by the land /rood and also sheep is subjected to walked during hot time of the day, they transport whole the day. and this leads animal to injured, dead, etc. and it makes the quality of the meat poor. Know day's animal weal fear is the great issue, the western countries outline strict animal welfare regulations and organizations are fighting for animals' rights in a society where economics is often deemed the most important factor. Around 167 country accepted international guide lines for animal weal fear. In Ethiopia animal weal fear as a subject that so far has not gained much attention and at there are no legislations for many years that protect sheep from cruel action by human suffering. Poor transportation can have serious deleterious effects on the welfare of sheep and can lead to significant loss of quality and production. The Consequences of poor sheep transport are Physical injury will cause loss of meat quality and subsequent rejection, the main forms of injury are bruising - bruising is the most serious and significant production loss as bruised, off-color meat must be wasted, Trampling - this occurs when animals fall down due to slippery floors or overcrowding. Sheep may also suffocate as a result and even die if not helped. Other forms of Injury is broken legs, horns etc. Mortality loss: sheep can die on route due mainly to Dehydration and exhaustion, Pasteurellosis breakdown of resistance to end parasites. Predator attack - sheep trekked under inadequate guarding may be attacked by wild animals; Bloat - restraining or tying the feet of sheep while trucking without turning them can cause bloating and subsequent death Poisoning- animals can die from plant poisoning during trekking or due to exhaust fumes from transport vehicle. The possibility of spreading animal diseases: Animals, especially those that are trekked, can be infected or they can spread diseases along the

trekking route.

4. RECOMMENDATIONS

- The handling of sheep in Ethiopia has been a subject for critical discussion for a long time and is in need of further research.
- Sheep welfare in Ethiopia is poor and transport conditions inadequate and this affects how animals behave towards stakeholders who are handling them. The transportation of animals should be governed by appropriate laws and legislations.
- Within the community there is lack of awareness on the extent of losses incurred during transport and also improper loading and unloading and during journey should be planned paying attention to the distance to travelled .opportunities for grazing , watering and overnight rest ..
- The new guidelines of the Ministry of Agriculture and Rural Development must be taught to all people concerned and must be enforced.

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