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# Assessment on Pre-Slaughter Handling of Animal, Slaughtering Process and Handling of Meat by Butchers in Bonga, Mizan, Aman, Tepi and Masha Municipalities

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**Abstract:** The study was carried out to assess the practice of pre-slaughter handling, slaughtering process and the hygienic condition of meat production in Bonga, Mizan, Aman, Tepi and Masha abattoir. Observations and semi-structured questionnaires were administered to collect information from fifty butchers. The surveyed data were analyzed using statistical package for social sciences. All butchers (100%) in the municipalities were males and those majorities (45%) were within the ages of 31-40. Furthermore 13% of the butchers had no formal education, 64% had primary and 23% had junior secondary school education. With regards of animal source, 92% of the butchers obtain their animals from the local livestock markets and 8% from farmers home. And 91% trek their animals on foot to the slaughter house. In all municipalities the butchers (N=50, 100%) redraw feed throughout the night prior to slaughter. According to observation, the slaughtering method in all the study area is directly stabbing in the neck of animal and makes them fall to the ground. With regards to the frequency of cleaning, 31% of the butchers wash and change their clothes and aprons once in a week, 59% of them wash or change their clothes and aprons every 2-3 days and 8% change every day. The remaining 2% of the butchers admitted that they change their aprons "when they feel it is dirty". Meat production in the study area is confronted with problems of inappropriate pre-slaughter handling of animals, slaughtering process and unhygienic meat handling.

**Key words:** Pre-slaughter · Post slaughter · Butcher · Meat · Abattoir · Lairaging · Hygiene

## INTRODUCTION

Ethiopia is located in the horn of Africa and has approximately 57.83 million cattle. Today, the agricultural sector estimates up to 47% of the national GDP and approximately 80% of the labor-force works within agriculture. The livestock sector is of national importance and the Ethiopian government has set goals to improve productivity in this sector [1].

In Ethiopia, the breeds of cattle vary a lot but are usually mixed with Zebu (Bos Indicus) and Sanga (Bos Taurus Africanus) [2], with the most popular breeds including Borana, Horro, Fogera, Arussi, Karayu and Nuer [3]. About 13.57 million chickens, 6.85 million sheep, 6.37 million cattle and about 5.35 million goats were sold and about 21.81 million animals (chicken, cattle, sheep, goats and camels) were slaughtered by households in 2015/16 [1]. At the same time, the rising population offers a great potential for a higher livestock production in the African countries and the request of meat production from the western countries increases each year [4].

Pre-slaughter animal handling involves all the activities animals are subjected to prior to sticking [5]. Pre slaughter components include (medication, veterinary inspection, feeding, provision of water or their redraw, loading), through marketing (transportation, selling of animals) and finally to the abattoir (offloading, lairaging, veterinary inspection and slaughtering) [6]. Poor pre-slaughter animal handling which includes bruises, injuries, starvation, tiredness, water and food deprivation and loading and unloading onto vehicles adversely reduce weight, affect the meat quality and subsequently reduce profit[8]. In less commercial abattoirs, there are high human-animal interactions which can be a cause of stress to the animal due to fear of humans [8-11] reported that with higher levels of stress poorer meat quality is eminent, quite apart from being inhumane.

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Post-slaughter animal handling begins at the abattoir (just after killing) and continues to processers of meat (processing meat into various meat products), to the market (selling of meats) and finally to consumers (cooking and eating). Post-slaughter carcass handling processes can be categorized into carcass condemnation, cutting of meats into various parts, application of processes such as electrical stimulation at the slaughter plant, storage conditions, processing of meats into products and cooking condition [6]. During process slaughtering, contamination can occur from slaughter facilities, equipments, workers and environment [12]. Carcass handling of meat can significantly affect the quality [13]; hence, these activities should be well planned and professionally carried out to minimize stress [14].

Southwestern Ethiopia has huge number of livestock and meat consumer, but there is no documented study on pre-slaughter handling of animal, slaughtering process and handling of meat by butchers. Therefore this study with general objective, carried out to assess the pre and post slaughter handling of animal and meat by butchers in Bonga, Mizan, Aman, Tepi and Masha municipalities and specifically how; animals are handled prior to slaughter, slaughtering process, hygienic condition and meat handling after slaughter.

## MATERIALS AND METHODS

**The Study Area:** The study was conducted in south western part of Ethiopia kaffa (Bonga), Shaka (Masha and Tepi) and Bench maji (Mizan and Aman) municipalities. Totally five major municipalities were selected according to their potential of slaughtering.

**Sampling Techniques:** Totally sixty (50) butchers were selected randomly, 50% from each municipalities and interviewed using semi- structured questionnaires.

**Data Collection:** The data collection consisted of three different parts: collecting secondary data, observations in slaughter process and an interview with butchers. The main purpose of the interview was to get further information about pre and post slaughtering process.

**Statistical Analysis:** The collected data (both quantitative and qualitative data) was cleaned and entered into Microsoft office Excel 2013 sheet every day after administering questionnaire to prevent loss of data. All the surveyed data were analyzed using statistical package for social sciences (SPSS, version 20).Analyzed data were presented using Tables, Figures and Percentages.

## RESULTS AND DISCUSSION

**Age and Educational Status of Butchers:** All butchers (100%) in the municipality were males and thus no female participates in the butchering and the selling of meat. The survey revealed that majority (45%) of the butchers, were within the ages of 31-40, followed by 41-50 (23%), 21-30 (19%) and 51-60 (13%). The butchering profession in the Municipality was dominated by the middle aged men who are more energetic as the butchering business requires much physical strength. This study agrees with reports by Salifu and Teye [15], who reported that the butchering profession is quite energy demanding and may involve a lot of traveling to livestock markets several times in a week hence the inability of older men to cope.

Furthermore 13% of the butchers had no formal education, 64% had primary and 23% had junior secondary school education. The results stated that, the butchers have low level of education and this could hamper the acceptability of modern slaughtering practices as well as adherence to strict hygienic and standard slaughtering practices.

**Sources of Animals for Slaughter:** The sources of animals for slaughter are shown in Table 1. From Table 1, majority (92%) of the butchers obtain their animals from the local livestock markets, 8% from farmers home. Therefore, animal production is a potential source of employment for farmers in the Kaffa, Sheka and Benchi Maji zones.

**Transporting of Animals to Slaughter House/slab:** Majority (91%) of the butcher's trek their animals on foot to the slaughter house from the place of purchase. Nineteen percent (9%) of them use sometimes trekking (Table 2). In general, trekking animals on hooves over long distances is the major means of transporting live animals to slaughter points. Such poor transportation means have also been reported by the previous studies [16- 18]. The tough means of transporting live animals is not suitable as they may induce stress on the animal before they reach the point of slaughter. Consequently, carcasses or meats from such animals are prone to meat quality problems like pale soft exudative (PSE), dark firm dry (DFD) and shorter shelf life [19].

Table 1: Sources of animals for slaughter

| | Municipality | | | | | Total | |
|---|---|---|---|---|---|---|---|
| Sources of animal | Bonga n (%) | Mizan n (%) | Aman n (%) | Tepi n (%) | Masha n (%) | N | % |
| Local markets | 10(20) | 10(20) | 9(18) | 10(20) | 7(14) | 46 | 92 |
| Farmer home | - | - | 1(2) | - | 3(6) | 4 | 8 |

Table 2: Means of transporting animals to slaughterhouse

| | Municipality | | | | | Total | |
|---|---|---|---|---|---|---|---|
| Sources of animal | Bonga n (%) | Mizan n (%) | Aman n (%) | Tepi n (%) | Masha n (%) | N | % |
| Trekking on hooves | 9(18) | 6(20) | 9(18) | 8(20) | 8(14) | 46 | 91 |
| Truck | 1 | 4 | 1(2) | 2 | 2(6) | 4 | 9 |

**Duration of Feed and Water Withdrawal Before Slaughter and Lairaging:** In all municipalities the butchers redraw feed throughout the night prior to slaughter according to FAO [20] specifies the withdrawal of feed 12-24 hours before slaughter. This will reduce the risk of contaminating the carcass with the gut content during evisceration and reduce processing time and cost. The results revealed that most of the butchers were following the recommendations as specified by FAO.

All of the butchers (N=50, 100%) do not give their animals water at all prior to slaughter. The practice of giving animals water some hours to slaughter agrees with the recommendation made by Ledger and A.Payne [21] that, clean water should be freely available to animals throughout the waiting period till slaughter. Giving water makes processing of rumen and intestine easier, it promotes proper bleeding to enhance meat storability and also it makes flaying very easy.

There was recognized lairage in all municipalities except in Masha municipality. Bonga, Mizan, Aman and Tepi municipality butchers said they do rest their animals throughout the night before bringing them the next morning for slaughter. Resting animals prior to slaughter enables them to recover from stress experienced during transportation and other forms of handling and reduces the incidence of meat quality problems such as if pale soft oxidative and dark firm dry meats.

**Pre and Post Slaughter Veterinary Inspection:** All the butchers (100%) indicated that, they do not obtain veterinary certificates from the animal markets before transporting their animals and these animals are inspected before slaughter. However, inspection made at the slaughter house shows that, ante-mortem inspection of animals is not appropriately done as animals with injury and minor source of deformities and illnesses were seen being passed for slaughter.

According to butchers (100%, N=50), in all municipalities during post mortem inspection carcasses unfit for human consumption are condemned and do not enter the market. According to butchers, condemnation may be partial or total depending on the extent to which the meat has been affected. In line with another studies, conditions such as dark firm dry meat, blood splash, bruises or diseased parts are trimmed off reducing meat yield [13].

Fig. 1: Stamping meat after post mortem inspection in Bonga abattoir

**Slaughtering Method:** In all study area stunning of animals prior to sticking was not practiced. The animals were directly stabbed in the neck, to make them fall to the ground in line with the finding of CSA [1]. They did not have much knowledge about the stunning of animals and the benefits on the quality and shelf life of meat. Stunning makes animals temporarily unconscious if properly done so that they will not feel pain during sticking. It reduces struggling, eases slaughtering operations and promotes effective bleeding. Stunning in particular has

been embrace by the animal activist as a way of promoting animal welfare, while some religious bodies (e.g. Muslims and Jews) disagree with stunning on religious grounds. Authors [21] reported that, slaughter routine in many parts of the world is sometimes dictated by religious beliefs and local customs which were evident in this study.

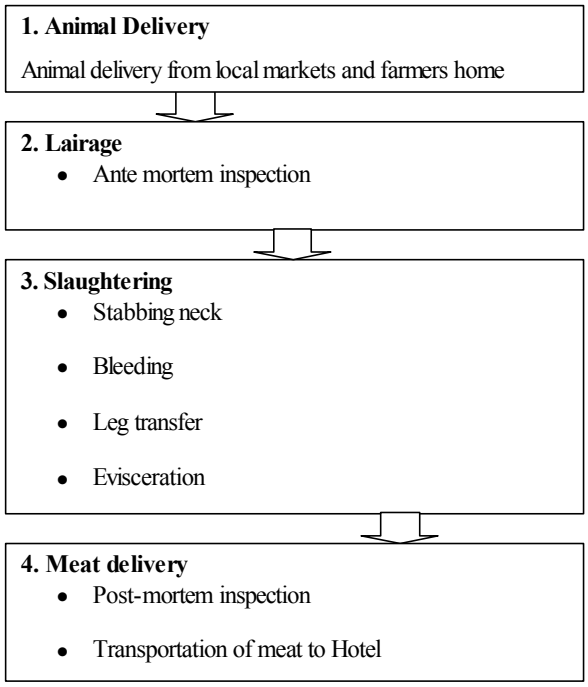


Fig. 2: Slaughtering process in study area

**Dressing of Carcasses:** In present study the 65% of the butchers dress their carcasses (large ruminants) on the bare floor in the abattoir, 35% of them dress their carcasses on unclean slaughter. Carcasses were washed with water during dressing, the slaughter floor and slabs. Furthermore, the results revealed that, majority (74%) of the butchers hang their meat up on the hall after dressing and 26% of them leave their meat on the floor for post-mortem inspection to be carried out. The practice of leaving dressed carcass or meat on filthy slaughter slab is unhygienic, exposes meat to contaminants and the risk of being a source of food borne pathogens, although meat inspectors (veterinary and public health inspectors) do inspect the meats after dressing.

**Hygiene:** All of the butchers (100%) indicated that, they clean their meat cutting tables and slaughtering equipments by scrubbing the surface with water, sponge and detergent. Even though the butchers responded that they clean their tables and equipments, they were seen with blood stains, accumulated fat and dirt with flies hovering over the meat, tables and equipments.

With regards to the frequency of cleaning, 31% of the butchers wash and change their clothes and aprons once in a week, 59% of them wash or change their clothes and aprons every 2-3 days and 8% change every day. The remaining 2% of the butchers admitted that they change their aprons "when they feel it is dirty".

Thus butchers in the study area do not observe adequate hygiene. Furthermore, the quality of meats produced in the study area is dubious due to the use of dirty clothing's/aprons, unclean hands and slaughtering equipments. Personnel at the abattoir do not use and/or wear clean aprons, clothing, boots, mesh gloves and hair cap during meat processing [23]. Such poor slaughtering and marketing of meats might have resulted in the isolation of various pathogens in beef, mutton and chevon sold in various markets of the Nigeria [18]. For good hygienic practices and production of high quality meat, butchers should maintain clean hands, wear clean protective clothing to cover both their body and hair and used thoroughly cleaned and regularly sterilized slaughtering knives and equipments.

Fig. 3: Dressing of meat in Mizan and Bonga

**Transporting of Meat to Sale Points:** The popular means of transporting carcass from the abattoir to sale points is by the use of abattoir truck. In small municipalities push trucks, basins on butcher's heads, on the hands and shoulders of butchers are means of transporting meat to Hotel. In line with current study [16] reported similar practices in the Garu-Tempane District since there is no meat vans in this area. The basins and most especially push trucks were always used to transport meat.

## CONCLUSION AND RECOMMENDATION

- According to the result of observation and interview, meat production in the study area is confronted with problems of inappropriate pre-slaughter handling of animals, slaughtering process and unhygienic meat handling.
- Such practices include the use of unsterilized and improperly cleaned knives and equipment's, dressing of carcass on filthy slaughter floor and hanging of meat in open places overnight; and thus meat produced in the study area could be contaminated before getting into the food chain.
- The Government, Ministry of Health and Ministry Agriculture should enforce the law that ensure good animal handling pre-slaughter and the operation of standard methods of slaughtering and handling of meats.

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