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The Debilitating State of the Maiduguri Main Abattoir, Poor Sanitary and Waste Disposal Methods; the Way Forward

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Abstract: An abattoir provides facilities where animals are slaughtered. The current state of most abattoirs in developing countries particularly Nigeria are a matter of concern considering the enormous lapses in their operations, the sanitary conditions and management. The northern part of Nigeria is the worst hit since the majority of food animals are domiciled in the region. This study was aimed at determining the state of facilities, sanitary conditions and practices of abattoir workers and the veterinary doctors in a major abattoir in North-eastern Nigeria. This observational study was carried out over a period of three months in the main abattoir in Maiduguri, north-eastern Nigeria. During the period, we documented the states of the facilities in the abattoir, the sanitary conditions as well as the practices of abattoir workers and the veterinary doctors present. Our findings revealed that the lairage was in a poor state and the drainages were clogged with debris and maggots. There were no meat stands and cold room and the entire surrounding environment was full of stench emanating from poorly disposed abattoir wastes. Besides, both ante-mortem and post-mortem inspections were hardly carried out and animals were being slaughtered in the open with carcasses processed on bare floor. Dragging of viscera's on the floor and washing of the stomachs in the drainages in addition to slaughtering of calves and pregnant animals were common practices observed at the abattoir. We documented the poor states of facilities, sanitary conditions and practices in the main abattoir in north-eastern Nigeria. Our findings suggest a compromise in the quality of meat being produced from the abattoir with overall devastating effects on the health of meat consumers. While quality meat production is key to achieving a healthy society, there is a need for a synergy among all the stakeholders particularly the government and private organizations towards improving the state of abattoirs in Nigeria with respect to the facilities, sanitary conditions and practices.

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Key words: Maiduguri abattoir, hygiene, waste disposal, ante-mortem inspection, post-mortem inspection.

1.0 Introduction

An abattoir or slaughterhouse can simply be defined as a place where animals are killed in a sanitary condition to ensure its safety and wholesomeness for human consumption (MARD, 2009). It is a building for butchering and houses facilities to slaughter animals; dress, cut and inspect meats; and refrigerate, cure, and manufacture by products. It is a special facility designed and licensed for receiving, holding, slaughtering, and inspecting meat animals and meat products before their release to the public (Alonge, 2005). The facilities' construction, drainage, water supply, disposal of refuse, and all

operations are under government regulation (The Columbia Electronic Encyclopedia, 2013).

The commonly slaughtered animals for meat in Nigeria are cattle, camel, goat, sheep, and poultry; others include pig, buffaloes, donkey, horses, rabbit and other games and forest animals that are edible (Maltin *et al.*, 1998). While there is a need for increasing animal production and slaughter (Adesokan, *et al.* 2012) due to the short fall in animal protein contribution to per caput food availability of Nigerians (FAO 2010); the poor state of abattoirs and meat processing plants; the ineffective meat inspection services and the resultant consumption of

unwholesome meat by the public have become a major cause of concern to all stakeholders in the industry and the general public. The nation's clamour, and indeed desire to achieve national self-sufficiency in food production, food security and food safety though noble one, is of little or no value if what ends up on consumer's table as dishes for consumption are unwholesome (Nwanta *et al.*, 2008).

Studies have shown that zoonotic diseases are yet to be eliminated or fully controlled in above 80 percent of the public abattoirs in Nigeria (Cadmus *et al.*, 1999), thus, posing serious environmental health risks. The upsurge in the prevalence of communicable and zoonotic diseases such as tuberculosis, cysticercosis and trichinosis in our communities are additional pointers to the relevance of our abattoirs and slaughter houses as disease surveillance points (Nwanta *et al.*, 2008). Besides, the numerous wastes produced by abattoir operations not only pose a significant challenge to effective environmental management but also are associated with decreased air quality of the environment, potential transferable antimicrobial resistance patterns, and several infectious agents that can be pathogenic to humans. Previous studies have documented a variety of contaminants, microbial agents and health effects in those occupationally or accidentally exposed to improperly managed abattoir wastes (Adelegan, 2002; Adeyemo, 2002; Abiade-Paul *et al.*, 2006).

A field investigation carried out by Nwanta *et al.* (2008), indicates that there are about 30 abattoirs, 132 slaughter houses and 1,077 slaughter slabs in Nigeria with a total annual slaughter capacity of 14,127,868 animals. As one of the meat processing facilities in the country, the Maiduguri main abattoir supplies meat to the teeming population in the region, majority of whom are not knowledgeable in possible health hazards that could be associated with poorly handled meat during processing. With this in mind, there is need for more efficient and drastic measures in addressing the state of Maiduguri main abattoir as a first step in the general appraisal of the entire nation's abattoir operating systems which are in a state of poor hygiene and management.

This study was aimed at determining the state of facilities, sanitary conditions and practices of abattoir workers and the veterinary doctors in Maiduguri main abattoir in North-eastern Nigeria as well as proffering solutions to ameliorate/eliminate the bad practices in the abattoir.

2.0 Materials and Methods

2.1 Study Area

This observational study was carried out over a period of three months in the main abattoir in Maiduguri, north-eastern Nigeria. The Maiduguri

main abattoir is located on longitude 013.10719°E and latitude 11.51519°N. Maiduguri is the capital of Borno state, located in the North East region of Nigeria and is situated at 11.85° North latitude, 13.16° East longitude and 300 meters elevation above the sea level (Figure 1). Maiduguri also called Yerwa by its locals is the largest city in Borno State located in the northeastern region of Nigeria having a population of about 1,112,449 inhabitants. The city sits along the seasonal Ngadda River which disappears into the Firki swamps in the areas around Lake Chad (Encyclopaedia Britannica). The abattoir was chosen because it was one of the main abattoirs in the North-eastern Nigeria with high volume of animals slaughtered there. Constant regular visits (two days a week) were made to the abattoir in order to survey the state of the facilities, sanitary conditions and practices in the abattoir. Materials such as boots, cover all, hand gloves, N-95 respirator, disinfectant and soap were used for personal protection. Data were collected through on-site observations and were documented accordingly.



Figure 1: Map of Maiduguri

3.0 Results

3.1.1 Facilities used in the abattoir

From the on-site observation, the abattoir though had lairage facilities to rest animals; they were nonetheless in bad shape and were not in use. The abattoir lacked clear demarcations between “clean” and “dirty” areas. There was no facility for separation of sick animals from the healthy ones. Facilities such as the rails and the hooks where animal carcasses are hung and screwed up for dressing within the abattoir were available, but the hooks were not enough given the volume of cattle slaughtered (between 120 and 200) on a daily basis. The abattoir had functional water taps, however; there were occasional lack of running water when the butchers would have to buy water to do meat processing. Hoists are available but not functional.

Meat stands/shades were available at the abattoir premises, there were no nets attached to these sheds in

order to prevent flies from perching on the meat hence the massive accumulation of flies on the meat that were being sold to the populace. The environment around the abattoir premises was always looking unkempt with no proper management and the environment was quite unhealthy and uncomfortable to both the sellers and buyers. Also, there were no refrigerators to store the meat. There was no meat van for the transportation of meat to the meat shops or the market. Meat was usually transported from the abattoir to other places in the booth of taxi's and tricycles (Keke Napep).

In addition, the huge amount of wastes generated during the daily slaughter was being dumped within the abattoir premises just behind the meat processing areas. This seems to be a great challenge to the system and a source of environmental pollution and contamination.

3.2 Sanitary conditions

The hygiene status of the abattoir was quiet poor. Although there was evidence that the abattoir was being washed, no detergent and disinfectants were used. In fact, there were cases of water shortage when only minimal washing with the available water would be done, making the place stinking and unkempt. Often times, the drainages in and around the abattoir were clogged with abattoir debris hindering free flow of effluents and thereby leading to accumulation of maggots which often migrated onto the killing floor (Plate 1a). In addition, butchers and other abattoir workers were sometimes seen spitting on the floor constituting nuisance and health hazards to those working within the abattoir and meat consumers as well. Some animals like cattle and camels were also slaughtered on the slab outside the main abattoir building (Plate 1b).



Plate 1a. Accumulated dirt with a lot of maggots on the floor just outside the main abattoir Building



Plate 1b. Slaughtering of animals outside abattoir building

3.3 Practices in the abattoir

3.3.1 Antemortem inspection

There was no ante-mortem inspection of animals carried out and animals were often brought in tied with ropes and chased into the abattoir. All sort of diseased, cachectic and moribund animals were slaughtered in the abattoir (Plates 2a & b). Sometimes, dead animals slaughtered during transport were brought to the abattoir for dressing because the animals could not make it to the abattoir alive.



Plate 2a. Slaughtered cachectic cow



Plate 2b. Moribund bull brought for slaughter
3.3.2 Postmortem inspection

Generally, there was no postmortem inspection of slaughtered animals in this abattoir since there was no compensation to be paid by the government to the animal owners for any condemned organ or carcass. Hence, such diseased meat and offals were often seen sold to the unsuspecting buyers. Through our on-site observation, diseases such as bovine tuberculosis, helminthoses, and dermatophylosis were commonly seen (Plate 2c).

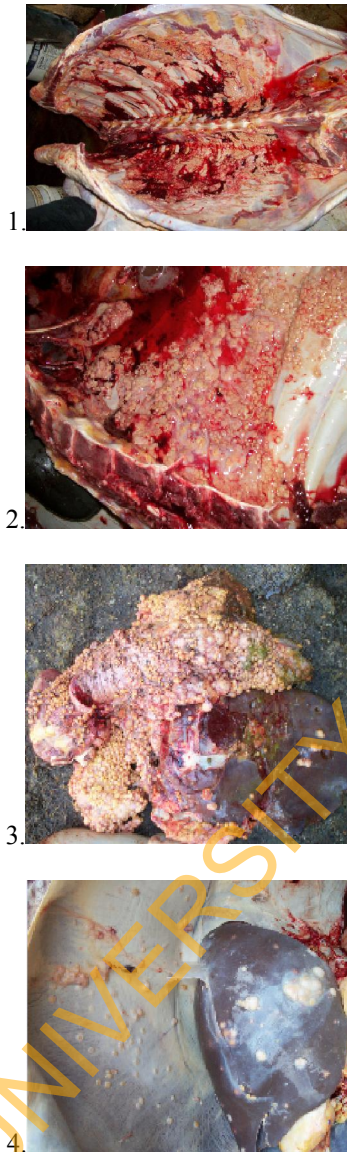


Plate 2c. Tuberculous-like lesions in the thoracic cavity (1 and 2); heart, lungs and liver (3); diaphragm and liver (4) of the carcass of a cow

3.3.3 Animal handling

In most cases, animal handling at the abattoir was very poor and hazardous. Some of the abattoir workers ended up being injured by these animals as

was a case of a butcher who was attacked on the chest by an aggressive bull. Live animals were dragged on the floor to the point of slaughter when they refused to walk (Plate 3a & b). Sheep and goats were tied in the wheel barrow and wheeled into the abattoir premises. The camels were directed to the place of slaughter by beating. Stunning of animals before slaughtering was absent due to the religious beliefs and culture of the people. Killing is done on the floor (Halal method of slaughter). Animals in the Maiduguri main abattoir are slaughtered in the Islamic way.



Plates 3a & b. Cows dragged on the floor taking into the abattoir for slaughter

3.3.4 Carcass handling

Some of the carcasses of the slaughtered animals were processed on the floor in both the small and large animal sections (Plates 4a & b). The stomach and intestines generally were kept on the floor and the stomachs were subsequently dragged on the floor to where they were being emptied and were then washed in the drainages containing dirt's and other effluents before being washed in clean water (Plates 4c & d). Some of the intestines and other organs were often hung on the wall before selling them to prospective buyers (Plate 4e).



Plate 4a. Meat dressing on killing floor



Plate 4b. Visceral organs on dirty floor



Plate 4c: Stomach dragged on the floor



Plate 4d: Washing of stomach in the dirty gutter before finally being washed with clean water



Plate 4e. meat hung on the wall

3.2.5 Butchers' unwholesome practices

It was a common scene to see most butchers including prospective buyers moving within the slaughter slabs bare-footed while others wear slippers and rubber shoes instead of boots. Those who sustain injuries often tie such wounds with polythene. They are often seen carrying meat on their backs instead of using pans (Plates 5a-b). Their work clothes are always dirty and unwashed with accumulated debris from day-to-day slaughtering activities. Besides, butchers are seen washing their hands in the crevices on the killing floor of the abattoir containing dirty water mixed with the blood of the slaughtered animals. The abattoir is always overcrowded with people while the carcasses are being processed. Aside overcrowding, recklessness by the butchers was also noticed. People carrying meat on their backs will hit you with the meat they are carrying deliberately. Purchasing of carcass (cow head, legs and tail) is conducted right at the slaughtering premises before taken out for carcass dressing and retail sales. Though not a common seen hawking is sometimes carried out within the abattoir building where animals are slaughtered; hawking of local drinks.



Plate 5a: Butchers in the abattoir and premises bare-footed, wearing slippers



Plate 5b: Butchers carrying meat on their backs to the meat stand

3.2.6 Slaughtering of calves and pregnant animals

Routine slaughtering of calves and pregnant animals characterized the abattoir with quite a number of fetuses recovered on a daily basis. More females are slaughtered when compared to the males as they are usually cheaper with some of them either old or sick and highly emaciated (Plates 6a-c).



Plate 6a: slaughtered calf



Plates 6b: fetuses from slaughtered pregnant cows



Plate 6c: fetuses from slaughtered pregnant camels

3.2.7 Child labour

The practice of children below the age of thirteen working in the abattoir cannot be overemphasized. Quite a number of them are seen inside the main abattoir building and the premises performing one task or the other. They could be seen as butchers or carrying meat outside the abattoir to the tables where the meat is sold.

4.0 Discussion

We reported on the facilities, sanitary conditions as well as practices that impact on meat quality at a major abattoir in Maiduguri, north-eastern Nigeria. The non-functional state of the lairage in this abattoir is in agreement with the findings of Igwe (2005) and Aliyu *et al.*, (2008) which states that lairages are not available in most Nigerian Abattoirs and where available they are not put to use due to their non-functional status. The method of immobilizing the animals is crude as it involves physical struggle to wrestle down the animal which according to Ikeme (1990) affects the quality of the meat. Lairage pens and passage ways should be constructed in a way that makes it possible to use the animals' natural exploratory behavior when moving them forward, the need for coercion can be minimized. For example, our commonly slaughtered species are all flock animals, and it is therefore quite difficult to move one single animal away from the flock. By keeping a small group of animals intact as long as possible, i.e. up to the entrance of the stun box or even into the stunner – depending on stunning method– the entire process will become much smoother for both animals and staff, compared with when individual animals are singled out at an early stage. By minimizing noise from metal gates and other equipment, using solid wall passageways to prevent visual distraction, avoiding sharp bends, dazzling light or sudden reflexes, a more calm and steady flow of animals can be achieved (Grandin, 2006).

As observed, stunning of animals before slaughtering was absent due to the religious beliefs and culture of the people. Killing is done on the floor (Halal method of slaughter). Animals in the Maiduguri main abattoir are slaughtered in the Islamic way. This

finding was also reported by Joseph (1999) in his investigations on cattle slaughtering and post-mortem handling practices in selected Nigerian cities, who particularly reported absence of stunning and proper meat processing operations. In addition, hoists are available but not functional and this means improper draining of blood from the animal which also affects the quality of the carcass as observed by Igwe (2005). There is absence of routine postmortem examination of slaughtered animals which constitutes public health risks following the diseases such as tuberculosis helminthosis which are prevalent in the area. This is in agreement with a previous report (Dandago *et al.*, 2009).

Generally, poor meat safety could arise in various ways such as chemical (pesticides and antibiotics) residues deposition, diseases in animals (zoonotic diseases) and most importantly by microbial contamination with pathogenic microbes and toxins (Oboegbulem and Muogbe, 1981; Winamo, 1992; Okolocha *et al.*, 2002). Microbial population is always in constant evolution, with infinite adaptive capacities towards conditions, that are used to control it, all making food safety perpetual issue. Ignorance concerning food safety measures provides potential for increased food borne diseases in man (Nwanta *et al.*, 2008). Therefore, dressing of carcasses on the killing floor portends serious public health concerns. There is heavy contamination of carcasses due to the unhygienic situation (feces and blood on the floor). Joseph 1999, stated that when animals are slaughtered in places which are frequently polluted with blood and faecal materials, not protected from flies and rodents, meat produced thereof are prone to quick deterioration due to high level of bacterial contamination. Apart from compromised quality of meat, such meat may cause food poisoning and would be a source of infection to man.

Furthermore, it was observed that all the camels and some of the cattle are slaughtered on the slab (floor) outside the main abattoir building. This practice is in agreement with the findings of Nwanta *et al.*, 2008 on abattoir operations and waste management in Nigeria who stated that slaughtering is generally carried out on the floor and outside the abattoir by individual butchers, whose knowledge of hygiene is low. Slaughtering and processing facilities in the Maiduguri main abattoir is inadequate. Pregnant animals are being slaughtered in the abattoir on daily basis with marked loss of fetuses constituting economic wastage. More females are slaughtered in this abattoir when compared to the males because cows are usually cheaper and some of them are either old (passed calving period) or they are sick and emaciated. Ideally, sound economic livestock management, demands that animals sold for slaughter

should be mainly males and reproductively inactive females (Opara *et al.*, 2006 ; Abdulkadir *et al.*, 2008 ; Cudworth 2008 ; Riehn *et al.*, 2010). Studies conducted by Muhammad *et al.*, 2009 indicated that 34.3% (of the 0.26 million) ewes were pregnant at the point of slaughter whereas an earlier report by Sanusi *et al.*, (2006) stated that out of 0.21 million goats that are slaughtered yearly, 26.1% of these 'does' were pregnant. The result further showed that many pregnant cows were slaughtered (62%) for meat and more male fetuses (56.7%) were wasted than the female fetuses in the process (Adama *et al.*, 2011). Non-conformity to the rules for which only unproductive, infertile, sterile, old or accidentally injured animals are allowed to be slaughtered shows a drift from the original code of conduct on public abattoir operation (Jode *et al.*, 1906 ; Judd 2003).

Poorly disposed abattoir wastes on the heaps within the premises further constitute environmental pollution and contamination which tends to be more serious during the raining season thereby constituting serious environmental and public health hazards. Waste generated as a result of abattoir operation in Nigeria is a source of embarrassment to the general public as conventional method for the disposal and management of animal waste, carcasses and manure as well as slaughter house and animal industry waste are now proving inadequate (Adeyemo, 2002). Abattoir waste has been reported to contaminate and increase the level of nitrates in ground water and cause methaemoglobinaemia (Meadows, 1995). Reports also showed that abattoir waste piled up within the environment can cause pollution and subsequently produce methane gas that intensifies greenhouse effect (Adeyemo, 2002). The waste could also be washed away by surface runoff to contaminate ground and surface waters including market places and streets (Meadow, 1995; Abiade- Paul *et al.*, 2006s). In Nigeria, the awareness of the waste pollution is low, thus pollution of natural and artificial waters and environment by these waste matters has continued to be one of the most important and complex challenges confronting public health authorities (Adelagan, 2002).

Butchers are seen carrying meat on their backs to the meat stand which is quite unprofessional and unhygienic with implications on meat quality. Meat stands within the abattoir premises are seen without nets or refrigerators, these encourages a lot of flies perching on the meat which is sold to the public. Considering the high ambient temperature in this arid region where meats are not frozen for lack of freezing facilities in the abattoir, there is enhanced putrefaction of meat. High ambient temperatures, heavy fly and rodent infestations recorded in abattoirs encourage the contamination of meat (Nwachukwu, 2006; Paul *et al.*,

2006). Adejuwon (1978), writing on pests and diseases in Nigeria remarked that diseases due to poor sanitation are transmitted through people who do not obey simple rules of hygiene such as eating raw meat, exposed meat and food among others.

In most cases existing abattoir designs are obsolete and varied and without uniformity. Inconsistent government policies, poor level of funding and non-existence of insurance scheme for butchers are among the challenges. The sewage and waste disposal systems need to be revisited for effective waste management. There is need for continuous and steady water supply for carcass processing. Nwanta *et al.*, (2008), stated that the slaughtering and processing facilities in the abattoirs are inadequate and there are no sewage or waste disposal systems, adequate clean water supplies and refrigeration.

The net result is deterioration of slaughter houses, improper meat inspection and compromise of public interest. The numerous waste and microbial organisms produced during abattoir operation not only pose a significant challenge to effective environmental management but also are associated with decreased quality of life among animal and human population (Nwanta and Achi, 2002; Adeyemo, 2002; Callaway *et al.*, 2004; Esona *et al.*, 2004; Abiade-Paul *et al.*, 2006).

6.0 Way forward

An efficient abattoir operation and meat hygiene programme is one of the means in attaining a healthy society. The benefits of such a system ranges from improvement of human health, decrease in the spread of zoonotic diseases, processing of good quality meat for whole and retail sales, reduced spoilage of meat due to improved sanitary condition and proper storage facilities. The squeal of the above stated mission is worth the struggle as the anticipated outcome will yield much good to the society. The handling of meat in Nigeria is generally unsatisfactory with the need of drastic and efficient measures to curtail the deteriorating state and unhygienic practices in our abattoirs due to the impending danger in tolerating such practices. The state government, the local government, veterinary officers, meat inspectors, butchers and the entire workers in the abattoir need to change their approach for better and satisfactory results in the management and practices of our modern abattoir systems which are fast collapsing. With this regard there is need for provision of logistics, payment of compensation to owners that brought in diseased animals following their condemnation. As a rule, the slaughtering of cachexic animals should be prohibited. The use of lairages should be imbibed in order to curtail the menace of aggressive cattle.

6.1 Training of Staff

Layout and design is crucial, but the knowledge and training of staff is just as essential (Grandin, 2006; Wotton and Wittington, 2008). Well-designed basic construction will give the staff possibilities to do a good job, but proper training and instructions are also necessary. This should include knowledge about normal animal behaviour for all species concerned, how the flight zone works and how it can be used to move animals forward without violent coercion, how to identify and handle injured or sick animals in the lairage area or passageways, and also knowledge about how rough handling will affect animal welfare and product quality. Avoiding stress or bruising is in the interest of the food business operator, to keep down grading and rejections to a minimum and meat quality traits optimal, apart from the obvious animal welfare aspects (Grandin, 2006; Wotton and Wittington, 2008). Trainings should also be organized for the veterinary doctors' and meat inspection officers for the acquisition of more knowledge on meat hygiene, ante-mortem and post-mortem inspections and proper code of conduct on abattoir operations. They should be given the freedom to carry out their duties (ante-mortem and post-mortem inspections) with no fear of contradiction.

6.2 Official Control of Animal Welfare at Slaughterhouses

Although, the responsibility for animal welfare lies with the business operator, animal welfare is seen as an area where the authorities have an obligation to perform official controls to verify compliance with existing legislation. In most countries – especially within the European Union – everyday animal welfare monitoring is carried out by the official veterinarians, who also have other tasks, mainly in the area of food safety (EC No 854/2004). The official veterinarians can inspect all incoming animals to ensure that they are fit for slaughter. If this is not the case, whether for animal welfare or food hygiene reasons, the animal in question should be immediately euthanized and destroyed. Furthermore, the official veterinarian can inspect animals in lairage and live animal handling when moving animals from lairage to the point of stunning. Finally, the official veterinarian can perform regular on-the-spot checks of stunning efficacy and bleeding procedures.

Slaughtering of calves and pregnant animals should be prohibited as this will affect the economic part of meat production in the long run. There is need to revive proper and strict ante-mortem inspection in order to drastically reduce the number of pregnant animals slaughtered in the abattoir.

6.3 Hygiene status of the abattoir and carcass handling

Constant and thorough washing of the abattoir and the gutters is relevant. There is need for

renovation of the entire abattoir and provision of a good drainage system. There are cobwebs all around and within the abattoir building which needs to be removed. Constant and proper sewage disposal, monitoring and preventing bad habits within the abattoir such as spitting on the floor and processing of meat on the floor so as to reduce the chances of early putrefaction due to heavy contamination. Animals brought to the abattoir should be slaughtered systematically in an orderly manner to avoid overcrowding. There is need for expansion of the abattoir in order to reduce overcrowding. Building of a section of the abattoir for camel slaughter and carcass dressing is also of paramount importance. Washing of meat offal's (rumen, reticulum, omasum and abomasum) in the gutters should be prohibited.

6.4 Code of conduct within the abattoir

Only workers wearing their boots should be permitted into the main abattoir building. Uniforms (coveralls) should be provided for butchers to wear before performing their task before entering the main abattoir building for easy performance of their duties and identification in order to minimize the number of people coming in and out of the main abattoir building where stunning, slaughtering and carcass dressing is carried out. Constant washing of these uniforms should be ensured for proper hygiene and to wipe away the mentality that dirty clothes should be used for such purpose because butchering is perceived to be a dirty job. Pans should be made available for carrying of meat from within the abattoir and the subsequent prohibition of workers carrying meat on their backs should follow suit. Washing of hands in the pot holes on the floor of the abattoir should be stopped because of the dirty water used and the pot holes need to be filled up. The use of gloves by butchers and those processing meat should be initiated as a means of protection for the workers.

Hawking in the abattoir should be stopped. Dragging of live animals on the floor should not be done. All the animals should be slaughtered and carcass dressed within the main abattoir building. Child labour within the abattoir and premises should be stopped. Government should scout for those children and force them to be in school. Building of proper stands with nets should be done and refrigerators for the preservation of meat should be provided. Provision of meat vans by the government for adequate transportation of meat and this will also serve as a means of revenue generation for the local/state government and a source of employment for the youths.

6.5 Insurance scheme

Implementation of insurance scheme for butchers and other abattoir workers should be put in place due to the nature of their work and the hazard that is

involved in this type of work. This will also add to the self-image of the workers and a feeling of being cared for.

6.7 Collective responsibility

After saying what needs to be done in order to sanitize our abattoir system, it is paramount to understand that steps need to be taken sequentially and appropriately to attain such goals. These ideas are mainly derived from the writings of Covey, 1999 in his book "Principled-Centered Leadership". First of all, there is need for a round table discourse between the state and local government authorities that are concerned with the issue of the management of the abattoir since it is now obvious that collaboration needs to be made to achieve such a desirable result. Clear statement of both parties on duties and revenue allocation should be discussed including the way forward which has been the main issue. There is need for private stake holders to be involved in this round table so as to effectively pass down the message to those that are involved.

The next step is to involve all the abattoir workers in the policy making so as to hear their own view of why the entire abattoir system is collapsing (these lapses should be identified by them and stated categorically) and proffering solution by them on how they think these lapses could be corrected. This is done in order to make them feel responsible for all that is going on in the abattoir and they will not feel like the rules are being imposed on them with the assurance that they are going to work hard to achieve these goals for effective operation and proper management of the abattoir including waste disposal. This will make them feel committed to the course since they are the ones that are making the policy. They should be made to understand this policy as a guide to achieving the goals of a clean environment and distributing good quality meat to the public. The goals and objectives of this mission should be discussed and clearly stated. Penalties for violating these rules should also be deliberated by the abattoir workers either in terms of fine or punishment when the laws are finally enacted. There is need to organize an in-house training for the butchers and abattoir workers in order to educate them on the need for proper hygiene, the benefits of such acts and the impending dangers for acting contrary to the norms since part of the problem is largely believed to be as a result of ignorance and a low level of education is observed with the majority of the abattoir workers, some do not even have any form of formal education. Therefore a thorough training on hygiene practices the pros and cons of following or not adhering to these rules should be made alive in them. In so doing we will be able to find out their own challenges and measures to take in order to combat the situation. This

training should be carried out continuously in order to keep refreshing their knowledge.

The mission statement of the abattoir should be created by carefully discussing it with the abattoir workers and coming up with one which all the workers will be committed to achieving. This mission and vision statement should be published in English and in the common dialects spoken in the area (Kanuri, Bura, Margi and Hausa) and pasted in and around the abattoir premises as a reminder to the goal of achieving a healthy society through proper meat hygiene and environmental waste management.

Conclusion

In conclusion, the key to achieving a healthy society through quality meat production can only be achieved by collaboration between the state, local government authorities, stake holders, abattoir workers and the relentless effort of the veterinarians and the health workers cannot be left out. In a system that is collapsing, all hands need to be on deck to attain a common goal. It is believed that the above information provided on the state of the Maiduguri main abattoir will proffer solution to the impending danger the system is facing and not just for Maiduguri abattoir but also for the other 80% of the nation's abattoir faced with such risk.

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