Journal of Sustainable Veterinary & Allied Sciences
P-ISSN-2695-2661 e-ISSN: 2811-1346
JoSVAS 2024 Dec. Vol 6 Issue 4: 263-267

Original Research

A review of the improper operations of slaughter houses: A tale of two slaughterhouses in South-eastern Nigeria

[1*]Kalu, E., [2]Nwanga, E.N., [3]Hyacinth, U.O., [4]Job, I.T., [1]Akpabio, U. & [5]Ezenduka, V.E.

[1]Department of Veterinary Public Health and Preventive Medicine, Michael Okpara University of Agriculture, Umudike [2]Ministry of Agriculture and Natural Resources, Abakiliki, Ebonyi State ,[3]Ministry of Agriculture and Natural Resources, Warri, Delta State, [4]Ministry of Agriculture and Food Security Makurdi, Benue State, [5]Department of Veterinary Public Health and Preventive Medicine, faculty of Veterinary Medicine, University of Nigeria Nsukka

**Correspondence:* Kalu.ekenma@mouau.edu.ng +234703 383 6963

ABSTRACT

In recent times, the abattoir operation in Nigeria has been geared towards the quantity of meat produced rather than the quality of meat and this is a major source of public health concern for the populace consuming such meat. The quality of an abattoir directly affects the quality of meat produced from its operation. This paper reviews the current state of two slaughter slabs in south eastern Nigeria and also the challenges of the industry with respect to associated public health risk and environmental pollution. Two slaughter houses in the southeast of Nigeria were purposefully selected and reviewed. They include slaughterhouses in Ubakala Abia state and Ikpa, Nsukka Enugu state. The reviewed revealed the deplorable state of slaughter slabs which included; dirty environment, lack of basic equipments needed for hygienic operations, low education qualification of butchers, untrained personnel, improper dressing of personnel, and mismanagement of resources generated, unhygienic means of transporting of meat. The condition of these slaughter slabs suggests that the meat and meat products derived thereof may not be wholesome for human consumption and thus liable to constitute public health hazard to the receiving communities.

Keywords: Review, Slaughterhouse, South-eastern Nigeria, wholesome meat

INTRODUCTION

The abattoir is a critical control point in the food value chain; given that meat is highly perishable and poses a public health hazard to humans if food safety measures are not implemented (Gebeyehu&Tsegaye, 2022).The purpose of an abattoir is to ensure the humane handling of animals using hygienic techniques for slaughtering and dressing to produce hygienically prepared meat (FAO, 1992). The quality of meat produced from the abattoir is often affected by a number of factors including the genetics of the animal, production practices, age of the animal at slaughter and handling of live animals prior to slaughter, during slaughter and post slaughter practices (Adzitey& Huda, 2012). Meat processing activities in Nigeria are mostly carried out in unsuitable buildings and by untrained personnel or butchers who are mostly unaware of sanitary principles (Olanike, 2002).

In this report, we presented two slaughter slabs located in Southern Nigeria to highlight the inadequacies associated with many abattoirs in Nigeria and to suggest better ways of producing meat and meat products that will be fit for human consumption.

CASE STUDY

CASE STUDY 1: UBAKALA SLAUGHTERHOUSE

The slaughter house in Ubakala is owned by the Abia state government and managed by the state ministry of agriculture and water resources. It has two slaughter halls one of which is currently under renovation. The butchers also slaughter cattle in between the two slaughter slabs on dirty bare floors. This slaughter slab processes only cattle. The slaughter house has no source of power supply, waste disposal system, pipe borne water, drainage system or toilet facilities. The lairage is fenced but is very far from the slaughter slab. The animals are often transported by chasing and flogging them down to the slaughter hall. The butchers and other workers do not wear any form of protective clothing; rather they are often shirtless and walk bare footed. The butchers and meat processors are made to pay revenue to the government for each slaughtered animal.

http://doi.org/10.54328/covm.josvas.2024.208

No form of ante-mortem inspection takes place in Ubakala slaughter slab but post mortem inspection is done sparingly by a youth corps member. All the processes involved in the processing of cattle to meat are done on the same spot. The Islamic method of slaughter is practiced in Ubakala and butcher often aid the bleeding process by sticking the slaughtered animal. Carcass processing is carried out on the dilapidating slaughter slab or done on the slab outside close to a pile of gut content near the gutters. Due to scarcity of water, a bucket of water often gotten from close by earthen pots is continuously used by a butcher to wash both carcass and offal. Also knives are used to process several animals without washing them.

Carcasses are often not chilled after slaughter which should be the case. Chilling of carcasses after slaughtering prevents the growth of bacteria and spoilage. Carcasses not sold after the days operation should also be chilled but in the case of this slaughter slab, the soak the carcasses in drums filled with water till the next day. This practice could lead to contamination of the meat. After processing, the carcasses are transported using improper means like motor bikes, wheel barrows, boots of vehicles etc which could be a major source of contamination (Figures I-VI).

.CASE STUDY 2: IKPA SLAUGHTER HOUSE

The slaughterhouse in Ikpa, Nsukka has one slaughter hall but the butchers also slaughter outside the slaughter slab. This slaughterhouse processes cattle, sheep, goat, pigs and dogs. The lairage connected to this slaughter house very close to the slab but the animals are harshly conveyed to the slab. The lairage is fenced which is good but it is often water logged when it rains. Ikpa slaughterhouse does not have a source of electricity, pipe or borehole water, drainage or waste disposal system. Animals are also slaughtered from the farms and homes and brought to the slab for further processing. The butchers and meat processors do you use any form of protective clothing.

No form of ante-mortem or post mortem inspection takes place in Ikpa slaughter. Carcass processing is done both inside the hall and outside the slab close to a pile of gut content deposited near the stagnant gutters. The Islamic method of slaughter is practiced in this slaughterhouse. Processing of animals from slaughtering to carcass splitting is often done at the same spot. The hides, cattle head, whole goat, sheep or dog are singed very close to the slab using fire wood fuelled with old tyres. The Ikpa slaughterhouse is not fenced their by attracts predators, scavengers and unwanted human visitors. The carcasses form this slaughter slab are often transported unhygienically to the meat market.

DISCUSSION

According to Adzitey *et al.,* 2011, the pre-slaughter animal handling of food animals involves all the activities the animals are subjected to prior to sticking. Such activities start from the farm, then transportation and finally in the abattoir. Components of transportation that may negatively affect stress levels and diminish the economic value of the animals and the meat products includes factors such as pre-transport conditioning, time in transit, distance travelled, environmental conditions and the condition of the lairage at the slaughterhouse (Southern *et al.,* 2006). Transportation of food animals is an unavoidable husbandry activity to which animals must be subjected to because these animals are often transported to the cattle market for sale or to the abattoir/slaughter slabs for slaughtering (Adenkola and Ayo, 2009; Sporer *et al*., 2008; Gupta *et al*., 2007; Minka and Ayo, 2007; Chandra and Das, 2001).

In most slaughter slabs, the withdrawal period from feed of 12-24 hours before they are slaughtered, is not normally observed by most butchers and this increases the risk of contaminating the carcass with the gut content during evisceration, and reduce processing time and cost (Adzitey *et al.,* 2011, FAO, 1991). It was observed that the animals were fed up until the point when they are taken from the lairage to be slaughtered. This was the case in the two slaughter slabs reviewed.

EFFECTS OF IMPROPER TRANSPORTATION OF LIVE ANIMALS

In some underdeveloped and developing countries, animal transport including loading and offloading is mostly stressful to the animals because majority of animals meant for sale are transported by walking them from farm to the market by or by using ordinary trucks not designed for animal transport (Maria *et al.,* 2004). Kalu and Aliyu, 2015 observed in their study that animals were not transported in adequate vehicles to the slaughter slabs or cattle markets and animal handlers are not well trained to handle the welfare of animals during pre and post transportation. This lack of knowledge about the welfare of animals during transportation often results in physical injuries, weight loss, ill health or even death which in turn leads to poor welfare conditions and economic losses (Ljungberg *et al.,* 2007; Frimpong, 2009). The quality of welfare the animals get during transportation is directly proportional to the quality of meat produced from such animals. Improper handling of animals during transportation majorly results to bruising of the carcass and the different degrees of bruising depends on the extent to which the animals were flogged during loading, transportation, offloading and the degree of overcrowding in the vehicles. This bruising occurs due to the rupture of blood vessels which leads to accumulation of blood in the muscles with or without damage to the skin and depending on the location of the bruises, there may be a need to trim the carcass thereby causing a decrease in the value of the carcass (Wigham *et al.,* 2018; Kline *et al.,* 2020). Improper transportation of food

Fig I: Washing of offal using dirty water

Fig II: Unwrapped meat in the boot of a vehicle

Fig III: A make shift unhygienic slaughter slab

Fig IV: Transporting meat using a motor bike a motorbike

Fig V: Earthen water pots used to store water

Fig VI: Unsanitary environment in the slaughterhouse environment

Fig VII: Singed dog on the same slab with a pig slab with pigs

Fig VIII: Unhygienic slaughter slab

Fig IX: Tyres used for singeing

Fig X: Unsanitary environmental environme

Fig XI: Indiscriminate disposal of bones

Fig XII: Waterlogged lairage

animals may induce stress which consequently results in carcasses that are prone to meat quality problems like pale soft exudative (PSE), dark firm dry (DFD), shorter shelf life, skin blemish, blood splash, bruising, cyanosis, two-toning, high microbial load, spoilage of meat, broken bones and death may occur from improper animal handling (Adzitey *et al.*, 2011; Adzitey and Huda, 2011; Forrest 2010 and Warriss, 2000). According to Gebresenbet 2003, animal welfare during transport could be improved by minimizing factors that are capable of inducing stress.

UNHYGIENIC PRODUCTION OF MEAT IN THE SLAUGHTER SLABS

Abattoirs play a significant role in the prevention of meat-borne diseases because of the high risk of meat contamination that can occur during meat processing, thus it is essential to maintain proper hygiene during meat handling (Siluma *et al.*, 2023).

Meat processing activities in slaughter slabs in most cities in Nigeria are mostly carried out in unsuitable buildings and by untrained personnel or butchers most of who have no formal education and therefore not aware of the principles involved in abattoir operations. Most of these slaughter slabs are not fully equip for the adequate production of safe meat but are still producing meat for the surrounding communities (Kalu *et al.*, 2017; Akpabio *et al.*, 2015). Poor hygienic standard of meat processing such as dressing of carcasses on filthy floors, the use of un-sterilized knives or slaughtering equipments in the processing of meat and the inappropriate means of transporting carcasses and cuts to the various sale points (Adzitey *et al.*, 2011) have been reported in some abattoirs. Meat produced from animals that were slaughtered on floors contaminated with fecal material and blood often deteriorate quickly due to bacterial contamination and they may be a source of contamination to humans if consumed (Nwanta *et al.*, 2008). The improper practices of slaughtering animals in dirty floors and unhygienic transportation of carcass were observed in the two slaughter slabs visited.

POST SLAUGHTER HANDLING OF CARCASS/MEAT

The methods of slaughtering and handling meat by abattoir workers can negatively impact the quality and safety of meat (Yenealem*et al*., 2020). Poor handling of carcass/meat during transportation may result in a high rate of contamination and spoilage (Noguera-Burbano*et al.*, 2017: Lulietto*et al.*, 2016; Chepkemoi*et al.*, 2015; Ntanga*et al.*, 2014). From this review, it was observed that transportation of carcass from the abattoir to various sales point/ meat market is unhygienically done. Most vendors transport their meat unpackaged in the boot of cars, motor bikes etc (fig 2 and 4). Carcasses should be chilled immediately after slaughter to prevent the growth of bacteria and spoilage. This cold chain should be maintained during transporting the carcasses to their various points of sale. This could be achieved by transporting them in vehicles that will help main the cold chain (Ricardson *et al.*, 2009). Once there is a rise in temperature, bacteria begin to multiply. The way carcasses are displayed for sale at the various markets also contributes to contamination of the meat. Contamination can take place through flies, dust, moulds, poor hygiene, especially by street vendors who do not wear gloves or protective clothing, and lack running water to wash utensils. All these factors compromise the microbiological quality of meat drastically thus pose a serious health threat to the public (Adesiyun, 1995). Cold chain is often not maintained at the vendors shop/table. According to Sofos 1994, meat is a high-risk food and should not be out of cold storage for more than four hours but most meat vendors display their meat for up to 10 hours without any form of refrigeration.

CONCLUSION AND RECOMMENDATION

This study revealed that the two slaughter houses lack all necessary facilities to implement meat processing according to standard specified by FAO/OIE. Human capacity as regards expertise to conduct meat inspection was also not adequate.

A number of factors which ensure that the production meat from abattoirs will be safe and wholesome for should be considered. Meat inspection is done primarily by veterinarians and hence, adequate number of veterinarians should be employed to handle the ante-mortem and post mortem inspections. The lack of education or low level of education of abattoir workers especially butchers is directly related to the level of unhygienic practices that goes on in most abattoirs hence they should be trained and retrained periodically on the best slaughtering practices to achieve wholesome meat production. This will also help to curb the attitudes of the butchers towards modernization. Measures should be instituted to ensure strict compliance of butchers and processors to the existing food safety practices. The taxes generated from government-owned abattoirs and slaughter slabs should be used exclusively to maintain the equipments and improve the operations of the abattoirs and slaughter slabs.

In conclusion, there are rules and regulations guiding daily abattoir operations and each slaughterhouse or abattoir should have knowledge of such rules and regulations. These rules and regulations should be made known to all the workers and enforced in order to produce wholesome meat fit for human consumption.

REFERENCES

Adesiyun, A.A. (1995). Bacteriological quality of some Trinidadian ready-to-eat consumes foods and drinks and public health risks to consumers. *J. Food Prot.*, 58, 651-655.

Adzitey, F. & Huda, N. (2012). Effects of post slaughter carcass handling on meat quality. *Pakistani Veterinary Journal*, 32 (2), 161 – 164.

Adzitey F., Gabriel T. & Dinko, M.M. (2011).Pre and post-slaughter animal handling by butchers in the Bawku Municipality of the Upper East Region of Ghana. Livestock Research for Rural Development 23(2),

Akpabio, U., Kalu, E. &Babalola, S. A. (2015).Assessment of Facilities and Slaughter Practices in Aba Abattoir, Abia State, Nigeria.*Journal of Veterinary Advances,* 5 (6), 957 – 961.

Chandra, B.S. & Das, N. (2001).The handling and short-haul road transportation of spent buffaloesin relation to bruising and animal welfare.*Tropical Animal Health and Production*, 33, 155-163.

Chepkemoi, S., Lamuka, P.O., Abong, G.O. &Matofari, J. (2015). Sanitation and Hygiene Meat Handling Practices in Small and Medium Enterprise Butcheries in Kenya—Case Study of Nairobi and Isiolo Counties. *Internet Journal of Food Safety*, 17, 64-74.

Gebeyehu, D.T., &Tsegaye, H. (2022). Food safety knowledge and practice of abattoir and butcher shop workers: a health risk management perspective. *One Health Outlook*, *4*(14), 1-14.

FAO (1992). Construction and operation of medium- sized abattoirs in developing countries. In: 97thAnim. Prod. Health Paper, pp. 1-104.

FAO (1991).Guidelines for slaughtering, meat cutting and further processing.FAO Animal production and health paper 91. ISBN 92-5-102921-0

Frimpong, S. (2009).“Effect of Pre-Slaughter Handling and Transport on Welfare and Meat Qualityof Cattle: A Case Study of Kumasi Abattoir,” Master’s Thesis, Kwame Nkrumah University of Science and Technology, Kumasi, 2009.

Gebresenbet, G. (2003). “Farm Animal Welfare during Transport.E.C Report on Farm Animal Welfare Current Research and Future Directions,” 2003 http://ec.europa.eu/research/agriculture/pdf/animal-welfare_en.pdf

Gupta, S., Earley, B. & Crowe M.A. (2007). Effect of 12-h road transportation on physiological,immunological and haematological parameters in bulls housed at different space allowances. *The Veterinary Journal*, 173, 605-616.

Forrest, J. (2010). Meat Quality Problems. Retrieved October 10, 2010, from http://ag.ansc.purdue.edu/meat_quality/meat_quality_problems.html

Kalu, E., Vincent P.O, Enogwe J.K. &Obioma O. (2017). Assessment of the current status of slaughterhouses and their waste management practices in selected Abattoirs in south- eastern Nigeria. *Journal of Veterinary AndApplied Sciences.* Vol. 7 (2), 35 – 44

Kalu E. &Aliyu M.M. (2015). Transportation of ruminant animals in Borno State: Welfare implications. *Journal of Veterinary and Applied Sciences.*5(1), 16-21

Kline, H.C., Weller, Z.D., Grandin, T., Algino, R.J. & Edwards-Callaway, L.N. (2020). From Unloading to Trimming: Studying Bruising in Individual Slaughter Cattle. *Transl. Anim. Sci.*, 4, txaa165.

Ljungberg, D., Gebresenbet G. &Aradom, S. (2007). “Logistics Chain of Animal Transport andAbattoir Operations,” *Biosystems Engineering.*96(2), 267- 277.

Lulietto, M.F., Sechi, P., Borgogni, E. & Cenci-Goga, B.T. (2016).Meat Spoilage: A Critical Review of a Neglected Alteration Due to Ropy Slime Producing Bacteria. *Italian Journal of Animal Science*, 14, 316-326.

Maria, G.A., Villarroel, M., Chacon G.&Gebresenbet, G. (2004).“Scoring System for Evaluating the Stress to Cattle of Commercial Loading and Unloading,” *Veterinary Record*, 154, 818-821.

Minka, S.N. & Ayo, J.O. (2007).Effect of loading behaviour and road transport stress on traumatic injuries in cattle transported by road during the hot-dry season.*Livestock Science*, 107, 91-95.

Ntanga, P.D., Mdegela, R.H. &Nonga, H.E. (2014). Assessment of Beef Microbial Contamination at Abattoir and Retail Meat Shops in Morogoro Municipality, Tanzania. *TanzaniaVeterinary Journal*, 29, 53-61.

Noguera-Burbano, A., Quiñones-Medina, S., Mosquera-Sánchez, A., Vivas-Quila, N., Morales-Velasco, S., Muñoz-Quiceno, J.&Burkart, S. (2017).Post-Mortem Management and Microbiological Presence as Quality Factors along the Beef Value Chain in Colombia.

Nwanta,.J.A, Onunkwo J.I., Ezenduka V.E., Phil-Eze P.O. and Egege S.C. (2008). Abattoir operations and waste management in Nigeria: A review of challenges and prospects. *Sokoto Journal of Veterinary Sciences* 7(2), 61-67.

Olanike, K.A. (2002). Unhygienic operation of a city abattoir in South-western Nigeria: Environmental implication. Journal of Environmental Assessment and Management, 4 (1), 23 - 28.

Quinn, P.J, Markey, B.K, Carter, M.E., Donnelly, W.J. & Leonard F.C. (2000).Veterinary Microbiology & Microbial Diseases.BlackwellScience.2nd edition. *ISBN: 978-1-4051- 5823-7*.

Richardson, M., Matthews, K., Lloyd, C. & Brian, K.(2009). Meat quality and shelf life.EBLEX. Agriculture and Horticulture Development Board (AHDB).

Siluma, B.J., Kgatla, E.T., Nethathe, B., &Ramashia, S.E. (2023). Evaluation of meat safetypractices and hygiene among different butcheries and supermarkets in Vhembe district, Limpopo province, South Africa. *International Journal of Environmental Research and Public Health*, *20*(2230), 1-16.

Sofos, N.F. (2007). Challenges to meat safety in the 21st century.*Meat Sci.* 78, 3–13.

Southern, K.J., Rasekh, J. G., Hemphill, F. E. &Thaler, A. M. (2006).“Conditions of Transfer andQuality of Food,” *Scientific and Technical Review of the Office International des Epizooties*, 25(2), 675-684.

Sporer K.R.B., Xiao L., Tempelman R., Burton J.L., Earley B. & Crowe M.A. (2008). Transportation stress alters the circulating steroid environment and neutrophil gene expression in beef bulls. *Veterinary Immunology and Immunopathology.*121(3-4), 300-320.

Warriss P.D. (2000). Meat science: An introductory text. CAB-International: England: Wallingford.

Wigham, E.E., Butterworth, A., Wotton, S. (2018). Assessing Cattle Welfare at Slaughter—Why IsIt Important and What Challenges Are Faced? *Meat Sci.*, 145, 171–177.

Yenealem, D.G., Yallew, W.W., &Abdulmajid, S. (2020). Food safety practice and associated factors among meat handlers in Gondar town: a cross-sectional study. *Journal of Environmental and Public Health, 2020*, 1-7.