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# POOR SANITARY PRACTICES IN ABATTOIRS: IMPLICATIONS FOR FOOD VENDORS AND PUBLIC HEALTH PROMOTIONS

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**Abstract**
Maintenance of standard hygiene, facilities, and compliance with policies is mandatory at abattoirs to produce a safe product. This paper reviewed poor sanitary practices in the abattoirs and their implications for food vendors and public health promotions. A food-borne illness outbreak is a serious public health concern that warrants prompt and immediate attention by the local health department. Although most outbreaks may be small and can be handled locally. Some food-borne outbreaks can extend across state boundaries and require federal agency involvement. Often, food-borne illness outbreaks gain heightened public concern and media attention that demand a response from a public health authority. The study concluded that dumpsites of abattoir wastes pose serious health problems to consumers, butchers and general inhabitants around abattoirs and that inadequate sanitary facilities and sanitation is a great risk to consumers because of meat contamination, when the meat is contaminated and taken by consumers it can result to various alimentary diseases. Based on the review, it was recommended amongst others that the abattoir operators should constitute a sanitation committee and task force to ensure compliance with sanitation practices in the abattoirs

**Keywords:** Abattoir, food vendors, public health promotions, sanitary practices

## Introduction

Across the world, including Nigeria, the demand for safe and hygienic meat has increased due to high-income elasticity and awareness of food safety issues. Ante-mortem examinations, scientific slaughtering methods, post-mortem examinations, and slaughtering of animals in hygienic ways up to the final saleable product are the prerequisites for producing healthy meat. Nevertheless, nowadays, the slaughtering of animals in Nigeria faces challenges of severe hygienic problems, which are considered to be a threat to food safety and consumers' health (Anower, 2008). Unhygienic and contaminated meat is a vital source of major zoonotic diseases. In Nigeria, zoonotic diseases like Anthrax, Tuberculosis, Brucellosis, Salmonellosis, Campylobacteriosis, and Leptospirosis are mostly a result of poor sanitation and hygiene practices in the abattoirs. Isolated different types of pathogenic microorganisms from fresh meat like *Salmonella spp*., *Yersiniaenterocolitica*, *jejuni*, which cause food poisoning and *Clostridium botulinum*, *Staphylococcus aureus*, and *Bacillus cereus* are responsible for serious meat-borne intoxication (Alonge, 2001).

Sanitation is the hygienic means of promoting health through the prevention of human contact with the hazards of waste as well as the treatment and proper disposal of sewage microbiological, biological or chemical agents of disease. Waste that can cause health problems includes human and animal excreta, solid waste, domestic water, industrial solid waste and agricultural waste (WHO, 2014). The term sanitation has been connected to several descriptors like sustainable sanitation, improved sanitation, ecological sanitation and many others. It involves the collection, containment, conveyance/ transport treatment disposal of refuse or waste. Alexia (2008) was of the view that good sanitation should not only involve a sanitation system that is economically viable, socially acceptable, technically and institutionally appropriate but should protect the environment and the natural resources, hence environmental sanitation. Environmental sanitation refers to all activities aimed at improving or maintaining the standard of basic environmental conditions affecting the well-being of people. It includes clean and safe water, clean and safe air, efficient and safe animals, human and industrial waste disposal, protection of foods from biological and chemical contaminants and adequate housing in a clean and safe


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surroundings. As explained by Wise Geek Mobile (2015) environmental sanitation is a set of actions geared toward improving the quality of the environment and reducing the number of diseases by taking actions that are geared towards improving the quality of the environment.

A food-borne illness outbreak is a serious public health concern that warrants prompt and immediate attention by the local health department. Although most outbreaks may be small and can be handled locally. Some food-borne outbreaks can extend across state-bound boundaries and require federal agency involvement. Often, food-borne illness outbreaks gain heightened public concern and media attention that demands a response from a public health authority (APHA 2018). Abattoir operations produce a characteristic highly organic waste made up of suspended solid, liquid and fat, The solid waste includes condemned meat, undigested ingesta, bones, horns, hairs and aborted refuse. Liquid waste involves dissolved solids, blood, gut content, urine and water. As urbanization and population increase, more water is required and great demand is made so underground and surface water is speared back into water sources making less portable water available (Shuval, 2001). Portable water refers to that water that does not contain chemical substances or microorganisms in amounts that could cause hazards to health according to Alonge (2001). The water that should be used for cleaning purposes should meet the above conditions. According to Aina (2001) of all environmental sanitation situations in abattoirs facing the nation, the most embarrassing is the indiscriminate dumping of cow faces and the inappropriate way of emptying and cleaning the stomach and intestines of cows.

The management of water, solid waste, and industrial waste, as well as pollution and noise control, all fall under the umbrella of environmental sanitation. Most of the waste collected is usually recycled in the environment. Recycling of waste uses less energy and is a great way of controlling air, and water pollution, creates employment and recycles post-consumer materials into industrial production as cited by Carl (2005). A slaughterhouse or abattoir is a location where animals are killed for sustenance. The killing of animals for community consumption is inevitable in many nations of the world, including Nigeria and dates back to antiquity. In Nigeria, nearly every town and neighbourhood is provided with slaughterhouses or slaughter slabs. National Environment Sanitation Policy aptly identified abattoir sanitation as one of the key policies in addressing problems of environmental sanitation in Nigeria. Problems faced in abattoirs include improper refuse disposal, inadequate water supply, inadequate sanitary facilities which result to open defecation and urination, overcrowding, and exposure of food and meat to flies and rodents. While the slaughtering of animals results in meat supply, other products like leather and skin, and livestock waste spills introduce pathogens and excess nutrients into surface water and can also contaminate groundwater (Meadows, 2005). Those wastes consist largely of solids, microbial organisms, and in special situations chemicals. Shallow wells as well as hand-dug wells are more dangerously polluted (Ifeadi, 2002) when this happens.

Abattoirs are such establishments where the respective authority gives license to slaughter animals under the inspections of the supervisory body for human consumption. Meat vendors have established a good number of slaughterhouses and meat shops in the city, suburbs, and even in rural areas to sell their products (Alonge, 2005). However, Jahan et al. (2015) isolated different types of pathogenic bacteria from the raw meat sold in different markets and reported 115 bacterial isolates of five genera, such as *Escherichia coli* (10%), and *Salmonella spp*. (13.33%), *Klebsiellaspp*. (20%), *Enterobacter spp*. (6.67%), and *Staphylococcus spp*. (26.67%). The presence of these pathogenic bacteria in fresh meat is undoubtedly alarming; hence the question regarding the quality of meat, specifically food safety and hygiene. We assumed that most of the abattoirs food vendors get meat might lack standard design, modern facilities, and appropriate practices related to hygiene and operational policies.
In many developing countries, including Nigeria, food vendors have formed an integral part of the food supply chain, particularly following the advent of urbanization (Ifeadi, 2002). The food industry has contributed immensely to human and economic development as studies conducted in some African countries like Nigeria, Morocco, and Kenya have shown that major food vendors usually earn above the countries' minimum wage. The socioeconomic role of the food sector in terms of its potential for employment creation, yielding income, particularly for women, and provision of food at an affordable cost to lower-income groups in the cities has been documented. In Nigeria, urban city dwellers spend as much as half of their food expenditure on street foods (Ifeadi, 2002).

As in other developing countries, the food sector in Nigeria is confronted with challenges. There is inadequate supervision and proper monitoring by food safety officers and the enforcement of food hygiene regulations is weak; a lack of training in food safety and good hygiene practices is also rife among food handlers. Hence,


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foods are at risk of contamination, often at all stages of handling. Therefore, understanding the effect of poor sanitation practices in slaughterhouses on food safety and health promotion is pertinent. There are many problems associated with abattoirs, which include improper waste disposal, poor water supply, inadequate sanitary facilities and proper sanitation, air pollution, exposure of meat to flies and rodents, and the springing of illegal abattoirs and slaughterhouses. These problems affect the quality of meat sold to the public and food vendors and also impede public health promotions. There is often little or no monitoring of the abattoirs. The writer has been inspired to review environmental sanitation practices and their effects on food vendors and public health promotions. The focus of this paper is to review the poor sanitary practices in abattoirs: Implications for food vendors and public health promotions.

**Sanitary Practices in Abattoirs**

A standard abattoir should have the following components; lairage, slaughter hall, slaughter slab, gut and tripe section, detained meat section, offal section, condemned meat section, water supply and cold room (Meadows, 2005). Others are; the hide and skin section, veterinary inspection section, sanitary section, veterinary office, laboratories, and waste disposal facilities. Inadequate abattoir facilities affect daily operations leading to the production of unsafe and unwholesome meat and meat products for human consumption (Murshed, et al., 2016). Adequate and proper abattoir operations such as antemortem inspection, slaughtering, bleeding, evisceration, post-mortem inspection, and waste disposal are important in the production and supply of wholesome meat for human consumption (Alhaji & Bawa, 2015). This can only be achieved by the presence of adequate, standard and functional operating facilities, proper sanitary conditions; and good hygiene practices (Alhaji & Bawa, 2015). Lack of standard facilities coupled with non-adherence to good manufacturing practices, good hygienic practices, and sanitary practices in abattoirs and slaughterhouses in developing countries, especially in Nigeria, were attributed to meat contamination and poor waste disposal, with resultant effects on the environment and human health in general (Richard et al., 2015).

An abattoir is a place where animals are slaughtered for the production of meat or protein that is supplied to the public. (Adeyome et al., 2019). The abattoir facility has various waste generation points and handling options. But abattoirs are not just crude; the waste generated is not treated before the regulatory bodies are never up to their duties to monitor the processing activities and the disposal of the waste (Mohammed & Musa, 2012). An abattoir or slaughterhouse is a place where animals are slaughtered or killed for human consumption (Lawan et al., 2013). The most commonly slaughtered animals for food are cattle, sheep, pigs, goats, and fowl for poultry meat. The practice of slaughtering livestock and its resultant meat supply also provides very useful by-products such as skin and leather (Komba et al., 2012). Abattoirs ought to be subjected to sanitary inspection to ensure that their products are safe for human consumption. These include inspections of the environment within the slaughterhouses, an inspection of live animals before slaughter; and also of the slaughtered ones. Before slaughter, animals ought to be observed to check for any abnormalities in their appearance or behaviour that could indicate sickness. After slaughter, animal carcasses ought to be inspected by qualified meat inspectors who know the signs of specific types of diseases and which organs may be found in them and a condition fit for human consumption. If the carcass passes the inspection, then it is safe for human consumption (Zegeye,2010).

Meat transportation should take place following the requirements for meat hygiene and the authorities concerned from one given establishment to another. Meat leaves the slaughterhouse or a cutting room on the same site within the slaughter establishment immediately, and transport is to take not more than two hours to ensure meat hygiene (Food Safety, 2017).

The most important components and other services of the abattoir include the lairage and slaughter hall. At the same time abattoirs in most African countries, are seen as potential pollutants (Green, 2006).

An abattoir that has been registered and licensed for the slaughtering of animals for human consumption should therefore have equipment for slaughtering, holding, processing, storing and distributing the carcass (Dandago et al., 2009). However, this responsibility has been neglected by mostly the local authorities who are the sole managers of abattoirs and slaughterhouses in Nigeria. This resulted in the deteriorating conditions of most facilities and the sanitary conditions, improper conduct of meat inspection, and inadequate hygienic processes which are having negative effects on public health. In most abattoirs and slaughterhouses, operating facilities are absent; there is also a lack of sewage and waste disposal systems, no provision of potable water, and no cold storage system and toiletry facilities for staff and workers (Akpabio et al., 2015). These conditions are important in protecting human lives and preventing the spread and transmission of diseases through the consumption of contaminated meat (Dandago et al., 2009). Adequate sanitary conditions, waste disposal and proper hygiene

practices are steps that can be taken to control the chances of meat contamination (Richard et al., 2015). Slaughterhouses' location should be far from the residential area, public institutions, and religious establishments, but should have access to permanent roads, available water supply, a friendly waste disposal system, and electricity. Considering those criteria, most slaughterhouses are located in inappropriate areas. Slaughterhouses are located adjacent to the residential area, which may lead the residents to exposure to different types of pathogens causing zoonotic diseases, food poisoning, diarrhoea, and other health outcomes (Hassanien, et al., 2006). However, most abattoirs in Nigeria do not meet this standard because of improper sanitary practices such as the burning of animals with car tires, the disposal and burning of solid wastes on the premises and lack of environmental sanitation.

**Implications of Poor Sanitary Practices in Abattoirs on Food Vendors and Public Health Promotions**

Many abattoirs are located in an environment and surroundings that are very poor in terms of cleanliness and disinfection, and such unhygienic surroundings may easily contribute to meat impurities by the residues deriving from environmental pollutants. In many slaughterhouses, there is no practice of disinfection of premises and this could contribute to an increased load of microorganisms there and subsequently could contaminate raw meat through the air or cross-contact through foot wares of workers or visitors as there was no use of footbath (Jahan et al., 2015). Lack of facilities or practice of hygiene and sanitation for visitors during entry or exit into slaughterhouses not only causes a problem in meat safety but also exposes visitors to pathogens having zoonotic importance at slaughterhouses. The ventilation system at many slaughterhouses fails to maintain the internal temperature, which leads to the proliferation of unwanted microorganisms that makes the working environment unsuitable for producing hygienic meat (UK essays, 2019). Hand washing and disinfection before and after slaughtering are vital and easy hygienic practices. Nevertheless, in most slaughterhouses, the workers ignore these habits, especially hand disinfection, despite having such facilities. Most times, abattoir workers are not aware of using Personal Protective Equipment (PPE) during slaughtering and meat processing (Hassan, et al., 2012). These dangerous malpractices are closely related to the contamination of carcass and raw meat and contribute to the burden of occupational hazards of the workers by increasing the likelihood of exposure to notorious zoonotic pathogens like *E. coli, Salmonella spp*., *Bacillus anthracis*, *Mycobacterium tuberculosis*, *Brucella spp*., *Campylobacter spp*., and other species (Gomes-Neves et al., 2012).

Liquid and solid waste produced by slaughterhouses during slaughter, evisceration, and meat processing are the primary sources of bacterial, viral, and parasitic pathogens. Poor drainage systems and garbage disposal services are prevalent in abattoirs. Most abattoirs lack facilities and use modern methods like composting, anaerobic digestion, alkaline hydrolysis, rendering, incineration, and burning for the disposal of waste and condemned carcasses. Due to the lack of such facilities, these wastes are littered directly to the environment and sometimes very close to natural water bodies. These misconducts are responsible for the contamination of water, soil, and the environment with those pathogens and allow the pathogens to spread over a wider area and thus elevate the risk of human and animal diseases in many folds (Kwadzah & Iorhemen, 2015). It is also worth noting that most slaughterhouses use water from hazardous locations, and many of them lack the availability of sufficient clean water supply needed for cleaning, washing, and related chores, even in some cases, stream and pond water are been used, most of which are already contaminated with tons of pathogenic microorganisms. Besides, hot water use as disinfection is completely absent in many abattoirs. The lack of these facilities may attribute to the risk of contamination of carcasses and raw meat and occupational hazards. In the surveyed slaughterhouses, cold chain facilities were absent. Hence it favours the rapid growth of pathogenic microorganisms, which results in a risk to public health and also increases the chance of spoilage of meat as it is a perishable product with a short shelf-life and short selling times (Nastasijevićet al., 2017). Raw meat and meat products can carry germs like viruses and bacteria that can cause illness (cross-infection). These germs can be transferred to our hands, cooking utensils and other food items. Food poisoning can also occur as a result of undercooked meat being served by food vendors. Contaminated meat that is not prepared in proper hygienic conditions can result in foodborne illness outbreaks and public health concerns.

**Conclusion**

Abattoir dumpsites pose serious health problems to consumers, butchers and general population around abattoirs. Pollution in abattoirs through the burning of horns, bones and skins in the open air poses problems to people because open burning is the wrong method of incineration. Inadequate sanitary facilities and sanitation are a great risk to consumers because of meat contamination, when the meat is contaminated and taken by consumers it can result in various alimentary diseases. The paper revealed that there is no effective monitoring of the Abattoirs by health inspectors. The point remains whether the regular checks are for the personal


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gratification of the person instead of forcing the butchers to do the right thing. Sanitation in Abattoirs is a serious issue to be addressed in the country. Most butchers lack knowledge of the dangers associated with an unhealthy environment, especially where meat that is meant for human consumption is slaughtered.

**Recommendations**

Based on the review of this paper, it was recommended that;

1. Management of abattoirs should provide waste collection and dump sites at strategic places to enhance waste disposal.
2. Management should emphasize the availability of potable water supply in abattoirs to improve and maintain the level of sanitation and cleanliness
3. The abattoir operators should constitute a sanitation committee and task force to ensure compliance with sanitation practices in the abattoirs.
4. The ministries of health and the environment should revoke the license and enforce punishment on abattoir operators whose mode of operation does not conform to state environmental and health standards.
5. Public health officers and educators should regularly visit the abattoirs for proper inspection and sensitization
6. Food vendors should be careful in their selection of what they buy from abattoirs to reduce the menace of poor hygiene.
7. Food vendors should be trained by health educators on food hygiene.

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