SHORT COMMUNICATION

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Abattoirs as meat safety and disease surveillance points in Nigeria: The case of Ikpa slaughterhouse, Nsukka, Nigeria

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Abattoirs are imperative surveillance points for early detection, monitoring and disease control along the meat supply chain. However, their function in this regard has remained underdeveloped in Nigeria even in the midst of pre-disposing factors of disease spread. In view of this, a descriptive study on the status of Ikpa slaughterhouse, Nsukka on the provision of physical facilities and the competency of workers for adequate meat inspection, good hygiene practices and waste management were evaluated by observation and interview of key stakeholders. Dilapidated facilities, poor waste management, poor knowledge and attitudes of butchers on hygiene and zoonosis as identified, pose limitations for meat inspection, hygiene standards and disease reporting practice at Ikpa slaughterhouse, Nsukka, Nigeria. The slaughterhouse is of very poor standard as a meat safety and disease surveillance point, hence the urgent need for the establishment of a contemporary abattoir, regular training and equipping of skilled staff to the ideals of abattoirs as meat safety and disease surveillance points in Nigeria.

Introduction

Disease surveillance is one of the essentials in the prevention and control of disease outbreaks, especially for infections that are imperceptible in animals but of great threat to humans (Defra, 2022). Abattoirs provide facilities for wholesome and safe meat production and early detection of disease agents in animals and animal products (OIE, 2019). Abattoir surveillance offers a cheap and large number of diagnostic specimens in slaughtered animals compared to live animals in the field (IBAR, 2012). It encourages better detection of infection by skilled manpower than livestock owners (IBAR, 2012). In developed countries, abattoirs employ a large skilled workforce for the detection of clinical and pathological conditions under strict meat hygiene policies unlike in developing countries (Komba *et al*., 2012). There are more than 30 abattoirs, 132 slaughterhouses and 1077 slaughter slabs in Nigeria, with about 14,127,868 supplies of animals annually (Nwanta *et al*., 2008). However, the poor infrastructural capacity and the small number of competent skilled workers have limited their uses in disease surveillance and safe meat delivery to the rapidly growing population (Biffa *et al*., 2012).

Meanwhile, many of the zoonotic disease agents like *Mycobacterium* species that cause tuberculosis in humans have been encountered unsuspectingly during slaughter in abattoirs in Nigeria (Cadmus *et al*., 2010). Moreover, the findings of granulomas lung during meat inspection is usually not recorded and the butchers are often reluctant to release condemned tissue for further examination. These in addition to poor infrastructure, ignorance and lack of government commitment with the exception of revenue collection have impeded the capacity of abattoirs to deliver as diagnostic and disease surveillance points (IBAR, 2012). The aim of the study, therefore, was to evaluate the capacity of Ikpa slaughterhouse, Nsukka, Nigeria as a meat safety and disease surveillance point.

Materials and Methods
The study was conducted at Ikpa slaughterhouse, Nsukka, Nigeria. Nsukka lies between the latitudes 6°51'N to 6°53'N and longitudes 7°23'E to 7°34'E (NGIA, 2008). It has a tropical climate that supports livestock farming and about 40 pigs, 30 goats, 20 cattle, 10 sheep and 1 dog is usually slaughtered in a day for income generation and meat consumption.

The status of an infrastructure for slaughter, processing and waste management was observed and evaluated using a checklist of standards for ideal slaughterhouse facilities (FAO, 1998). The aim of the study was further explained to the butchers that were found at the slaughterhouse and 20 persons who consented were interviewed on their capacity in recognizing disease lesions, observe hygiene practices and awareness of meat-borne zoonotic diseases using an interview guide (NDA, 2007).

Plate I: Side view of Ikpa slaughterhouse, Nsukka. Both solid and effluent were accumulated beside the kill floor. Butchers usually slaughter on the ground floor which are already in a dilapidated condition. No adequate water supply as water is source with containers

Results and Discussion
At Ikpa slaughterhouse, Nsukka, the water supply is highly inadequate. There is neither borehole nor overhead water tanks as water is supplied in gallons. The facilities including the slaughterhouse floor were in dilapidated conditions. The lairage is yet to be floored and this allows the accumulation of dung with the resultant pungent odours and grubbiness of slaughtered cattle (Nwanta *et al*., 2008). The slaughtering activities are still performed on the tattered floor and the viscera are usually dragged on the kill floor (Kwaghe *et al*., 2016). The deteriorated facilities were a result of poor maintenance and overutilization and these have impeded the capacity of the slaughterhouse as meat safety and passive disease surveillance point (Ndalama *et al*., 2013; Istifanus & Bwala, 2017) (Plates I and II). The slaughterhouse is in a poor state of hygiene in agreement with the report from Ogbor Hill abattoir, in Abia state, Nigeria, where standard facilities for the processing of slaughter cattle were lacking (Umunnakwe & Onwumere, 2017). Meanwhile, there has not been any legislation on abattoir hygiene since the colonial era in Nigeria (Lawan *et al*., 2013). The urgent need for repairs and replacement of infrastructures in the slaughterhouses in Nigeria was highlighted by Lawan *et al*. (2013) and Oyediran, (2015) who reported that all the major abattoirs in the Northern and Southern regions of the country were in a deplorable situation and could no longer support the production of safe and wholesome meat. This has impacted negatively on the environment and public health at large (Istifanus & Bwala, 2017). Ikpa slaughterhouse is of poor anaesthetic value due to the accumulated solid waste and effluents in its environment, as have been reported in other studies in Rivers and Imo States of Nigeria where poor drainage facilities at the slaughterhouses were totally inadequate or non-existent (Obidiegwu *et al*., 2019). However, the practice of slaughterhouse waste disposal via the water bodies as reported in Osun State, Nigeria could lead to water-borne infections rather than air-borne infections (Olowoporoku, 2016).

About 60% of the workers at Ikpa slaughterhouse do not know the significance of certain disease diagnostic lesions such as tubercles in lungs for TB cases while 15% displayed an indifferent attitude towards hygiene as they were found eating food while carrying out meat processing and this poor perception and ignorance may have contributed to food-borne infection in the locality (Ndalama *et al*., 2013). The practice of regular hand

washing and wearing protective clothing is not implemented by 90% of the butchers. This was in agreement with 87.8% and 82.9% of workers that were reported neither washing their hands before engaging in slaughtering activities nor wearing protective coverings respectively in the Abuja abattoir (Enem, 2017). In Niger and Edo States, Nigeria, sensitization and training of slaughterhouse workers were emphasized, out of findings that the majority of the workers neither have any previous training on meat hygiene practices and sanitation nor knowledge of slaughterhouse operations (Akinnibosun & Imade, 2015; Alhaji & Baiwa, 2015).

There is an urgent need for government intervention in the provision of, portable water sources and toilet facilities at Ikpa slaughterhouse (Jayathilakan *et al*., 2012). Improved slaughter hygiene, rapid removal of waste from the kill floor during evisceration and washing of carcasses with potable cold water would enhance an overall reduction in meat contamination (Shafini *et al*., 2016). There is a need for regular fumigation of the slaughterhouse environment, treatment and disposal of slaughterhouse wastes through environmentally friendly methods like composting, landfilling and controlled incineration (Kwaghe *et al*., 2016). Training, wearing of protective clothing, regular health checks and fitness certificates should be made compulsory for every abattoir staff (Obidiegwu *et al*., 2019). The employment of more veterinarians in the service of the state government would improve regular meat inspection at the abattoirs. The use of a computer system in the compilation of the findings of a coordinated inspection and decisions made on a daily basis should be encouraged. An adequate compensation system for meat loss due to carcass condemnation would encourage cooperation and compliance with inspection outcomes.

In conclusion, Ikpa slaughterhouse is of poor structural, skilled staff capacity, hygiene and waste management status and therefore not qualified as a diagnostic and disease surveillance point. There is an urgent need for a modern slaughterhouse with highly skilled personnel capacity that would support good hygiene practices and operations as a meat safety and disease surveillance point.

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Conflict of Interest
The authors declare that there is no conflict of interest.

Plate II: Front view of Ikpa slaughterhouse, Nsukka showing the dilapidated condition of the kill floor and the effluent disposal channel

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