

# Health Implications of Sanitation in a Public Abattoir in Port Harcourt, Nigeria

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## ABSTRACT

### BACKGROUND

*Meat, a universal staple food item is gotten primarily from farm animals after slaughtering and preparation in abattoirs or slaughter houses. The slaughtering of animals in abattoirs or slaughter houses ensures the production of supervised, wholesome and healthy meat and meat products. There are pointers that this may not be the situation in all abattoirs in developing countries like Nigeria.*

### AIM

*The study was aimed at evaluating sanitary conditions and their attendant health implications at the Port-Harcourt abattoir.*

### METHODOLOGY

*Following ethical approval, this descriptive cross-sectional study started with a reconnaissance work through survey to the Port Harcourt abattoir. Thereafter, respondents were selected by stratified sampling with proportionate representation of all categories of operators in the calculated sample size of 74 respondents. Data were collected using structured self (and in some cases, interviewer) administered questionnaires and processed using Microsoft Excel package and presented in tables.*

### RESULTS

*The study showed that the operators were mostly (100%) in agreement that infrastructure and processes like lairage, waste disposal, water, pest and animal inspection were either non functional or below acceptable standards. The walk*

*through (done with a checklist of the components of sanitation) further buttressed responses of the participants as the abattoir was lacking in hygiene, space, infrastructure and services.*

### CONCLUSION

*This abattoir is lacking in infrastructure and operation as attested to by the operators and the walk through. There is the need to upgrade facilities at the slaughter house. In addition health education of the operators on modern, more hygienic and safer abattoir practices is advocated.*

**Keywords:** *Public Abattoir; Sanitation; Port Harcourt.*

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### INTRODUCTION

Sanitation is the formulation and application of measures designed to protect public health or disposal of waste[1]. The World Health Organization (WHO), defined environmental sanitation to include nine components viz: the control of community water supplies, refuse disposal, housing conditions, excreta and water waste disposal, disease vectors, food supplies and handling, atmospheric conditions and safety of working environment [2].

A slaughter house or abattoir is a facility where animals are killed in sanitary condition to ensure its safety and wholesomeness for human consumption as food products [3]. These animals include sheep, cattle, goats, chickens, turkeys and ducks. Typically 45-50% of the animal can be turned into edible

products (meat) about 15% is waste, and the remaining 40-45% of the animal is turned into by-products such as leather, soaps, candles and adhesives [3,4].

The ideal abattoir operation uses the line slaughter system which entails hoisting up the carcass at an early stage preferably beginning with bleeding. Subsequent procedures are carried out with the carcass suspended and moving along an overhead rail or line. This is in contrast with older and less hygienic batch-slaughter and booth-slaughter systems. The slaughter house process differs by species and region and may be controlled by civil law as well as religious laws. For abattoirs to function hygienically, attention must be paid to Lairage (which must have sufficient space to allow diseased animals or those suspected of being diseased to be kept away from the healthy ones). Also, the abattoir must have accommodation, cleaning and repair facilities, water supply and toilets, hand washing and bathrooms, sterilizers, first aid materials, waste treatment, refuse disposal and drainage [5, 6].

Nigerian abattoirs are considered among the dirtiest in the world, where health hazards result from careless handling (including burning of animals with car tyres) and failure to organize proper collection schemes for animal wastes [6]. In Nigeria, the National Environmental Sanitation Policy identified market and abattoir sanitation as one of the key policy issues to address the enormous problems of environmental sanitation in the country. The sanitation challenges were as a result of improper planning of abattoirs, lack of facilities such as portable water, institutional regulations, enforcement and monitoring as well as corrupt and sharp practices by the supervisors of abattoirs [5,6]. A study in Kano (one of the largest cities in Nigeria) to evaluate slaughter practices showed that despite having a good design, virtually all the facilities (including water supply) were no longer functional. The available lairage was hardly used and no pre-slaughter ante-mortem examination was

done. In addition processes like immobilization, killing, evisceration, post mortem examination and by-product handling were either inadequate or non-existent[5].

Port Harcourt is a rapidly growing metropolis with one registered public abattoir which over the years has become too small to meet the growing needs of the city. This has led to the proliferation of pockets of unregistered abattoirs in and around the city. This seemingly over-stretched Port Harcourt abattoir may be having challenges of proper supervision and adherence to best practices. The study was aimed at evaluating the health implication of sanitation at the Port-Harcourt (public) abattoir.

## **MATERIALS AND METHODS**

**Study area and population:** This study was carried out at the registered Port-Harcourt City public abattoir located at Trans-Amadi, Port-Harcourt Rivers State. Port-Harcourt City is a fast growing multi-ethnic, multi-racial metropolis with a petro-dependent economy. The abattoir slaughters an average of 100 cows, 300 goats and 50 sheep per day while the remaining meat demands are met by private and or unregistered abattoirs in the city. There about 250 registered operators of the abattoir which include herdsmen, livestock dealers, butchers, inspection officers, veterinarians and petty traders. The abattoir is open between 7am and 4pm daily.

**Study Design and sampling:** This descriptive cross sectional study involved stratified sampling technique where there was proportionate representation of each group of operators of the abattoir. A sample size - including attrition of 74 respondents (calculated using the formula for proportion) was selected [7]. The criteria for inclusion were that respondents must have worked in the abattoir for at least 2 years and should be at least 20 years old.

**Data collection and analysis:** The study was carried out using a structured self- (and where applicable, interviewer-) administered

questionnaire which probed socio-demographics, knowledge and behaviour of respondents towards sanitation in the abattoir. This was preceded by a reconnaissance walk through visit of the abattoir for an independent on-the-spot assessment of the slaughter house. The questionnaires (with the assistance of three trained medical students) were administered through three days after the busy slaughtering period to all categories of respondents with the literate ones responding un-aided while the others were guided. Data were entered directly into Microsoft Excel spread sheet and presented in tables.

**Ethical Considerations:** This study was approved by the academic board of the Department of Preventive and Social Medicine as an academic research. Permission was also sought for and obtained from the abattoir's butchers' association. Signed informed consent following assurances of confidentiality was also obtained from respondents prior to commencement of the study. A health awareness campaign was carried out at the end of the study.

**Limitation:** Respondents were very uncooperative at first for fear of closure of the abattoir since it had recently had some bad publicity in the international media bothering on general sanitation and hygiene. They were assured that it was purely an academic exercise and their responses would be treated in utmost confidence.

## RESULTS

A total of 74 questionnaires were administered. Sixty nine (69) questionnaires were responded to and returned, with 5 questionnaires not returned.

**Table 1: Respondents socio-demographics**

| Variables      |                  | Freq (n) | Percentage (%) |
|----------------|------------------|----------|----------------|
| Age(in years)  | 21-30            | 14       | 20.3           |
|                | 31-40            | 26       | 37.7           |
|                | Above 40         | 29       | 42.0           |
|                | Total            | 69       | 100.0          |
| Sex            | Male             | 60       | 87.0           |
|                | Female           | 9        | 13.0           |
|                | Total            | 69       | 100.0          |
| Marital status | Single           | 20       | 29.0           |
|                | Married          | 49       | 71.0           |
|                | Total            | 69       | 100.0          |
| Religion       | Christianity     | 34       | 49.0           |
|                | Islam            | 35       | 51.0           |
|                | Total            | 69       | 100.0          |
| Education      | Primary          | 34       | 49.3           |
|                | Secondary        | 27       | 39.1           |
|                | Tertiary         | 8        | 11.6           |
|                | Total            | 69       | 100.0          |
| Job title      | Admin/dealer     | 20       | 29.0           |
|                | Health Inspector | 10       | 14.5           |
|                | Butcher          | 39       | 56.5           |
|                | Total            | 69       | 100.0          |

**Table 2: Knowledge and behaviour of abattoir workers**

| VARIABLE                     |              | FREQ(n) | PERC. (%) |
|------------------------------|--------------|---------|-----------|
| Not all animals safe         | Yes          | 69      | 100.0     |
|                              | No           | 0       | 0.0       |
|                              | I don't know | 0       | 0.0       |
|                              | Total        | 69      | 100.0     |
| Abattoir adequate            | Yes          | 0       | 0.0       |
|                              | No           | 69      | 100.0     |
|                              | I don't know | 0       | 0.0       |
|                              | Total        | 69      | 100.0     |
| Aware of lairage             | Yes          | 69      | 100.0     |
|                              | No           | 0       | 0.0       |
|                              | Total        | 69      | 100.0     |
| Have lairage here?           | Yes          | 69      | 100.0     |
|                              | No           | 0       | 0.0       |
|                              | Total        | 69      | 100.0     |
| Lairage used for ante-mortem | Yes          | 65      | 94.2      |
|                              | No           | 4       | 5.8       |
|                              | Total        | 69      | 100.0     |
| Waste disposal adequate      | Yes          | 29      | 42.0      |
|                              | No           | 40      | 58.0      |
|                              | Total        | 69      | 100.0     |
| Water supply adequate        | Yes          | 0       | 0.0       |
|                              | No           | 69      | 100.0     |
|                              | Total        | 69      | 100.0     |
| Ground killing is good       | Yes          | 54      | 78.3      |
|                              | No           | 15      | 21.7      |
|                              | I don't know | 0       | 0         |
|                              | Total        | 69      | 100.0     |
| Veterinarians adequate       | Yes          | 0       | 0.0       |
|                              | No           | 69      | 100.0     |
|                              | Total        | 69      | 100.0     |
| Pest control adequate        | Yes          | 0       | 0.0       |
|                              | No           | 69      | 100.0     |
|                              | Total        | 69      | 100.0     |
| Routine post-mortem          | Yes          | 67      | 97.1      |
|                              | No           | 2       | 2.9       |
|                              | Total        | 69      | 100.0     |

**Walk through survey:** The reconnaissance (to reduce bias) walk through showed that this overcrowded meat market was located next to a major busy general market. The road leading into the abattoir was muddy and un-tarred. There were haphazardly built lock up shops. There was a lairage which was hardly used. Animals were pulled to the open slabs for slaughtering. The butchers were not wearing cover all or boots. Pre-slaughter inspection was shabby and slaughtered animals were left on the bare concrete slabs to flies. The hides of the animals were roasted using tyres just as drainage was virtually non-existent. More so, there is a small creek by the abattoir which serves as source water to the adjoining village and has now become a waste dump site for the abattoir operators.

## DISCUSSION

The slaughterhouse at Trans-Amadi, Port-Harcourt is old and most facilities were either out dated or grounded. The abattoir is patronized by all strata of persons and (like other food items) contamination here could have far reaching effects in the number of persons affected. Therefore, sanitation here should be taken seriously. The socio-demographics of respondents showed that most of the operators were male and poorly educated. This level of education makes it difficult for persons to imbibe and practice new sanitary principles without proper education and supervision. Most cattle come from Northern Nigeria which is predominantly Muslim. This explains the nearly equal participation of Christian and Muslim faiths in a seemingly Christian Southern Nigeria.

The respondents in Table 2 showed that there was inadequacy in space, safety of slaughtered animal, hygiene, waste disposal, pest control, water supply and qualified inspectors as respondents in nearly 100% of the variables attested to these shortcomings. The inadequacy in these essential sanitary variables put the safety of the meat from this abattoir to question as the absence or lack of good sanitation provides breeding ground for disease causing microbes[5].

The walk through showed that the abattoir still practices the batch slaughter system in contrast to the more modern and hygienic line slaughter system. The former system exposes the meat to contamination as evisceration is manually done on the floor. The walk through also showed that there was no steady source of water and the slaughtered animals were roasted using car tyres. The insufficient water allows for disease causing microbes to grow just as the burning using tyres exposes consumers to cancer causing free radicals like hydrogen sulphide. The location of the abattoir next to a major market also compounds the sanitary challenge as both places generate a lot of organic waste which serve as viable nidus for microbes to thrive. There was also poor drainage for both sewage and sullage increasing the risk of communicable diseases. Water pollution of the creeks from the abattoir is yet another source of a possible epidemic [6]. The abattoir being close to a filthy and cramped market (which serves as a constant source of flies and other pests) could have the meat easily contaminated and render the meat from this abattoir unwholesome [8].

## CONCLUSION

The study showed that infrastructure and practices at the Port Harcourt abattoir were either inadequate or non-existent. This situation is likely to expose slaughtered livestock to microbes and disease causing pests. It is recommended that the abattoir be modernized to include adequate infrastructure, maintenance of these infrastructure, proper supervision and health education of the operators on healthy practices.

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