

Appraisal of Meat Inspection, By-product Utilization and Management Practices in Jos Abattoir, Jos, Nigeria

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ABSTRACT

Appraisal of meat inspection, by-product utilization and general management in Jos abattoir was conducted based on participatory appraisal approach using designed questions in accordance with the terms of reference as agreed by the authors. Open ended interviews with principal staff and butchers during fortnight visits to the abattoir in December, 2009 and January 2010 was employed to elucidate the goal of this study. Information gathered revealed the abattoir was located at Gring village in Jos South LGA, in Plateau State and established in 1975. It was licensed by the Federal Livestock Department and Pest Control Services (FLDPCS), Abuja, presently controlled by the state veterinary department. The initial staff strength (12 veterinary staff and 20 government employed butchers) has risen to approximately 50 personnel with only five (5) butchers on government pay roll. The animal slaughter figure has significantly increased since the inception of the facility. The structure which met the standard features and requirement for site at the time it was built. These features are either not functional or dilapidated with recent encroachment of residential buildings. Ante mortem examination was not done often while meat inspection was carried out by veterinary assistants (inspectors) post slaughtering of animals on the floor which further contaminates the meat. Diseases are identified tentatively based on gross pathology and documented. Waste disposal was a major problem due to the non functional suction pump waste evacuator. By-products were collected and processed by butchers /artisans for use and or sales include blood and bone for meals, skin, hooves and horns for other industrial products. In conclusion, this report provides preliminary status on the Jos abattoir as at the time of study. It is therefore, recommended that state government constitutes a committee charged with the responsibility of providing a workable plan for the renovation or relocation of abattoir to a site far from residential buildings. Re-training of veterinary inspectors should be conducted so as to enhance their capacity to conduct quality ante and post mortem protocols, while ensuring personal hygiene and hygienic handling of meat. This protocol should be strengthened with a working diagnostic laboratory.

Keywords: Participatory appraisal, meat inspection, management, Jos abattoir

INTRODUCTION

Abattoir is any premise that is approved and registered by the controlling authority in which animals are slaughtered and dressed for human consumption. The main purpose is to centralize and conduct expert supervision pre and post slaughter process to prevent zoonosis and control indiscriminate waste disposal as recommended by the international code of hygienic practice for fresh meat (CAC, 1993). Meat is a perishable commodity which has been recognized as a disease carrying agent which if not properly handled results in unbearable economic and public health problems. This adverse impact led to the development of the centrally coordinated global meat inspection protocol conducted in Athens and Rome which was traced back to the Greco-Roman era 460 BC – 388 AD (Schwabe, 1984). In Nigeria, the first meat ordinance was enacted in 1917, years later the first central city abattoir was built at Apapa-Lagos in 1945 (Okon-Eyo, 1979) after which appropriate measures were taken to construct similar abattoirs in other major towns. Nigeria adopted the veterinary meat inspection recommendation of the FAO/WHO joint committee on meat hygiene (WHO, 1962). Although the time of implementation for this recommendation varied from state to state, the abattoir in Jos which was established in 1976 enforced this protocol in the facility operations. However, the information on the efficiency is limited. Participatory appraisal is largely based on qualitative techniques of an intelligence gathering nature with an overall strategy, methodology and

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philosophy based on qualitative enquiry (Moris and Copestake, 1993; FAO, 2011). The application of Participatory appraisal in veterinary medicine is referred to as Participatory epidemiological (PE) methods which evolved in the 1990s (Thrusfield, 2005). Although PE studies can be purely qualitative in nature, standardization and repetition of PE methods can produce quantitative data leading to estimates of disease incidence, mortality or other variables (Catley, 2006). The flexibility and process of triangulation in PE is used to improve the validity of findings and involves cross-checking information from different sources or methods, including conventional veterinary investigation methods (Catley, 2005). This study seeks to appraise the abattoir in Jos metropolis on its expected role in meat inspection, by-product utilization and general management through a participatory approach using designed questions in open ended interviews with principal staff and butchers in accordance to the term of reference as agreed by the authors.

MATERIAL AND METHODS

Study area

Jos is a city and the administrative capital of Plateau state which is in the middle belt of Nigeria. It is located on 9°86' N and 8°90' E high on the Jos Plateau. The city is divided into three local government areas namely Jos-North, Jos-South, and Jos-East with an altitude of 4,062 feet (1,217m) above sea level. It enjoys a moderate temperate climate with a monthly average temperature range of 20° – 25°C and is covered by grassland (Anon, 2011a). Plateau State is bordered by (Bauchi State) to the north east, (Kaduna State) to the north- west (Nasarawa State) to the south west and (Taraba State) to the south east. The state is further subdivided into seventeen Local Government Areas with over forty ethno-linguistic groups. These ethnic groups are predominantly farmers and have similar cultural and traditional ways of life. People from other parts of country have come to settle in the State; these include the Igbo, Yoruba, Ijaw, Bini and Hausa predominating in Jos North as well as Fulani/Kanuri in Wase. The total human population figure amounts to about 3.5 million according to 1991 census (Anon, 2011b).

Questions were designed and structured in accordance with the terms of reference of this study, which included abattoir location, Date of establishment and controlling authority (licensed by), initial and present capacity: (Number of personnel, Number of butchers and Types and number of animals slaughtered), fulfillment of abattoir requirement for site, standard features present in the abattoir and their functional state, qualification of who conducts meat inspection service and action taken, disease records (previous records for three years was assessed and reviewed), waste disposal and by- product utilization, general administration in the abattoir, source of information and any other comments or observation by the authors

Participatory appraisal approach using designed interview questions in accordance with the term of reference as agreed by the authors and described by (McCracken, 1988; Cartely, 2005) was adopted. Personal observations by the authors and open ended interviews and discussions with principal staff and butchers/artisans during the fortnight visits in December, 2009 and January 2010 was documented and analyzed.

RESULTS

Abattoir location

The abattoir is sited at Giring 'village' within the Jos south Local Government Area of the state. It is popularly called abattoir, located about 6 km away from the Jos main market in the northwards direction, bordered by millionaires quarters in the east, Dogon karafe settlement in the west and Air force military school/Ray field settlement in the southward direction. The geographical coordinates (GPS) of the abattoir was on longitude 9°54N and latitude 8°54E

Date of establishment and brief history of the abattoir

This abattoir was built by the Danish for the Federal Government in 1975 and subsequently handed over to the state government. Veterinary public health commenced fully in 1977 during the era of Group captain Dan Suleiman as governor of the state and General Olusegun Obasanjo as the Head state of the Federal Republic of Nigeria. This abattoir has been the main source of wholesome meat for the culturally diverse inhabitants of Jos metropolis and its environs as the building design had one section for the cattle, two separate sections for small ruminants (sheep and goats), [one section flays carcasses and the other roasts the skin on the animals] and lastly a section for pigs.

Registered and licensed by a controlling authority

The abattoir is under the control of the Veterinary Department in the Ministry of Agriculture and Natural Resources of Plateau State and licensed by the Federal Livestock Department and Pest Control Services (FLD& PCS), Federal Ministry of Agriculture, Abuja.

Initial capacity

Number of personnel was 12 (veterinary public health), Number of butchers: approximately 20 (employed by the state government) while type and number of animals slaughtered was as indicated by 1983-1984 records; sheep and goats approximately 57 daily, cattle approximately 60 daily. Camels, pigs, chicken were also slaughtered but their slaughter index was more unstable and easily influenced by demand, season and festive periods.

Present capacity

The number of personnel is about 50 which is comprised of one Veterinary surgeon (DVM), 15 veterinary inspectors (OND and HND in Animal health) 5 butchers (on government pay roll). Others include administrative and finance/account staff, office assistants and labourers. There are over a hundred (>100) private practicing butchers and related artisans (50) who are self employed and engage in the business of abattoir by-product (skin, blood and bone), waste collection and processing. The type and number of animals slaughtered were as stated: cattle, minimum of a hundred to two hundred (100-200) per day depending on demand and season. For sheep and goats, the slaughter figure is about fifty to hundred (50-100) per day depending on demand. For pigs, slaughtered figure is low on weekdays which approximately four to six (4-6) per day. However, the number increases at weekends (Saturdays) to about twenty to thirty (20-30). Lastly, average number of camels slaughtered is about ten (10) weekly. A retrospective slaughter statistics (2006-2008) is as illustrated in Table 1.

Table 1. Annual slaughter statistics for cattle in Jos Abattoir (2006-2008)

Year	Sex		Total
	Male	Female	
2006	22,080	11,040	33,120 (35.7%)
2007	18,576	12,384	30,960 (33.3%)
2008	13,995	14,805	28,800 (31.0%)
Total	54,651 (58.8%)	38,229 (41.2%)	92,800 (100.0)

Fulfillment of abattoir requirement for site

The abattoir had met all the requirements in terms of access roads, rail line, electricity, portable water supply, and proper drainage because of its location on elevated hilly site. However, the adjoining livestock market no longer exists as well as the recent encroachment of residential buildings around abattoir neighborhood militated against its present site.

Features of standard abattoir present and their functional state

General observations revealed that the abattoir was built and equipped to standard at inception but the present state indicates massive structural decay. The lairage was present but it has been converted to slaughter slab for ease of slaughtering of animals by butchers. The slaughter hall, tripe and gut room, detention and condemned meat room as well as staff offices and toilets were present and functional. However, the rail gravity line was present but dilapidated, water supply system was also present but erratic in supply, and the cold room though present but not functional due to lack of electricity.

Meat inspection services

The veterinarian in charge of the abattoir is charged with the responsibility of meat inspection which was often conducted by the four veterinary inspectors with HND qualification and two OND holders from the state Ministry of Agriculture. Ante mortem inspection was occasionally done from a distance and obviously diseased animals with fractures, discharges from natural orifices and or visible swelling are usually detained for further examination. Those certified for slaughter are led by the butchers to any available space in the lairage or the slaughter hall for bleeding, removal of extremities and flaying on the floor. After evisceration, the meat is inspected and certified passed for human consumption if organs and lymph nodes are normal. However, suspicious animals/organs are detained /condemned partially or totally post visual examination of the gross pathology. Subsequently, the tentative disease was documented and the carcass meat bagged and transported in non galvanized floored pick up vans to the markets. The skin, head and legs (cattle, sheep and goats) are roasted, washed and also transported to market or sold

by the butchers within the abattoir premises.

Disease records

The records of diseases and conditions commonly encountered in the abattoir amongst cattle as indicated by the ante mortem and meat inspection procedures include tuberculosis (TB) (13.2%), contagious bovine pleuropneumonia (CBPP) (9.9%), fascioliasis (10.0%), helminthosis (7.7%), foetal waste (6.6%), wounds and fractures (5.3%), dermatophilosis (5.0%), mastitis (4.2%), cysticercosis (4.1%), diarrhoea (3.9%), abscesses (2.3%), pneumonia (2.1%) and PPR (20%) in sheep and goats (Table 2). The organs bearing the gross pathology is partially or completely condemned.

Table 2. Diseases/conditions observed during antemortem and postmortem meat inspection

Disease	Year			Total (%)
	2006	2007	2008	
Dermatophilosis	27	38	23	88 (5.0)
Fractures	37	26	31	94 (5.3)
Foot rot	8	3	2	13 (0.7)
Diarrhoea	23	31	15	69 (3.9)
Uterine prolapsed	5	9	2	16 (0.9)
Retained placenta	2	3	3	8 (0.5)
Dystochia	1	2	1	4 (0.2)
Parturient paresis	-	3	-	3 (0.2)
FMD	6	9	11	26 (1.5)
Rumen impaction	4	1	3	8 (0.5)
Foetal waste	41	32	44	117 (6.6)
Pneumonia	11	17	9	37 (2.1)
Mastitis	23	35	17	75 (4.2)
Abscess	16	13	11	40 (2.3)
Cysticercosis	18	32	22	72 (4.1)
Helminthosis	43	58	35	136 (7.7)
Fasciolosis	59	47	72	178 (10.0)
CBPP	54	62	58	174 (9.9)
Bovine Tuberculosis	68	89	76	233 (13.2)
PPR (sheep & goats)	136	108	119	363 (20.1)
Contagious ecthyma	8	2	1	11(0.6)
Total	590	620	555	1,765 (100)
Total animal slaughter	33,120	30,960	28,800	92, 880 (1.9%)

Waste disposal and by product utilization

waste disposal was a major problem in the abattoir. As designed earlier, a truck evacuates the waste using a pumping machine from a pit into the truck which was not functional. This ingesta was been dumped at the back of the abattoir forming 'hills' serving as potential source for environmental and public health threat. Recently, the waste was being evacuated at no cost to farms and government nursery for use as manure. By-products were collected and processed by the artisans engaged in this trade. The blood was cooked, dried and bagged as blood meal, while bones were burnt and processed to bone meal. Skin are preserved by salting (wet or dry), dry salting was the routine method employed for preservation and processing into leather which is eventually used for making shoes, belts, bags etc. Skin were also roasted and sold as meat popularly called 'pomo'. Hooves and horns were gathered and sold to buyers from Lagos and other parts of the country for use as industrial raw material for production of plastic plates, key holders, shoes and ear rings.

Administration in the abattoir

At the apex of the organogram of the abattoir is a project manager who is Veterinary surgeon charged with effective supervision of all activities in the premises. The veterinary public health section has a sectional head that was in charge of meat inspection that ensured wholesome meat was made available to the public. Hide and skin unit, charged with the flaying activities, preservation and marketing of hide and skin. The administration section was in charge administrative activities, finance and account section was charged with revenue collection and financial up keep of the abattoir, while the engineering section was charged with facility maintenance which include plumbing, electrical and mechanical works.

Source of information

Before the commencement of this study, a pre – study courtesy visit was first embarked upon to the abattoir Project Manager, to discuss the desire and aim of the study and solicited for maximum cooperation. Two principal staff (Principal Animal Health and Husbandry Technologist and a Hide and skin personnel) were then attached to this project team for further execution of this survey.

DISCUSSION

The overall structural and environmental impact assessment reveals that the abattoir fulfilled the requirement for site selection, in terms of access to roads, rail line, electricity, portable water supply and proper drainage because of its location on elevated hilly site (specification) and purpose at the time of its construction in last four decades. The structural facilities are presently old, vandalized or non-functional, hence considered to be very poor which exposes the public living around to potential diseases from sick or dead animals as well as the aerosol that emanate from the abattoir. Information gathered indicates that the abattoir was constructed on the outskirts of the town, but the present observation where encroachment of residential buildings around the abattoir may threaten its continuous existence and sitting was brought about by rapid urbanization. The rail line which was a major consideration for the present location was non functional as these animals were transported by road. In addition, the existing cattle market is no longer in use as it is surrounded by public market and residential buildings. The present holding capacity of the abattoir is grossly insufficient, which could be attributed to increasing population and number of animals brought for slaughter as a result of soaring demand for meat in the city. Authors' observation and continuous discussion with the primary data sources further revealed a protracted lack of electricity and insufficient water supply. This has lead to the protracted poor sanitary conditions in the abattoir with little or no effort by the abattoir authority to rectify this condition. It was also gathered that abattoir has never being renovated since its inception.

Antemortem and meat inspection is not routinely carried out, while slaughtering, flaying, evisceration, decapitation of the animal is carried out on the floor. This act increases the risk of meat contamination and only gross pathology is usually the basis for partial or complete condemnation for suspicious organs. This calls for great concern as many sick animals may be slaughtered for meat as the quality assurance may be doubtful for public consumption. The exposed and dirty manner in which post inspected meat is transported and marketed further expose meat to contamination. Previous meat inspection records further indicated tuberculosis (TB), contagious bovine pleuropneumonia (CBPP), fascioliasis, cysticercosis, helminthosis, dermatophilosis, abscesses, mastitis, wounds and fractures as commonly encountered diseases and ailments in the abattoir. The unscientific verdict made by these meat inspectors within their little knowledge of basic principles of meat inspection and disease pathology which compels them to apply a wide margin of safety in their judgment. Thus, using symptoms to denote disease entities, such as diarrhoea, abscess and pneumonia as it could be associated with a number of diseases. The high occurrence of tuberculosis is usually based on gross lesion with no laboratory analysis being conducted, which may be associated with other causative agents such as any member of the actinomycetes. During our visits, a few cases of fractures, dermatophilosis and helminthosis were observed which conforms to disease reports in the archives. It was also observed that massive solid waste litter the facility premises, which may serve as potential breeding site for microorganisms of public health importance. However, the cascade of events and people involved in abattoir by-product utilization process is enormous, innovative and commendable as it creates employment, financial self reliance, and raw materials for agro-allied industries as well as other household producing industries in and around the state.

Animals are tallied against the owners only for revenue collection purpose. This emphasis on revenue collection has shifted the duty of the abattoir from its primary purpose of establishment for disease prevention and control. The above findings is similar to other evaluation studies conducted in some parts of the country by Okon-Eyo, (1979); Ogundipe and Ajioye, (1997), which suggests the lack of political will on the part of government to initiate renovation, maintenance and abattoir management to facilitate handling of meat in conformity with international hygienic standards.

In conclusion, this report provides preliminary status on the Jos abattoir as at the time of study. It is therefore,

recommended that the state government constitutes a committee charged with the responsibility of providing a workable plan for the renovation or relocation of abattoir to a site far from residential buildings. Continuous re-training of veterinary inspectors should be conducted so as to enhance their capacity to conduct quality ante and post mortem protocols while ensuring personal hygiene and hygienic handling of meat. This protocol should be strengthened with a working diagnostic laboratory.

ACKNOWLEDGEMENTS

We acknowledge the permission granted by the Project Manager of the abattoir which enhanced the quality of this report as well as the efforts of Mr. Joseph Jinji Bingim and Silas Abu towards the success of this study.

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