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AN APPRAISAL OF THE KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) OF MEAT HANDLERS ON THEIR PERSONAL HYGIENE IN GWAGWALADA MUNICIPAL ABATTOIR, ABUJA, NIGERIA

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ABSTRACT

An appraisal of the knowledge, attitude and practices of meat handlers on their personal hygiene was undertaken in Gwagwalada municipal abattoir, Abuja, Nigeria. The slaughter practices in the abattoir contribute significantly to the keeping quality of meat both in the abattoir and in the retail outlets. Disease pathogens may be introduced in meat through careless handling by butchers and other meat handlers or operators, thereby constituting grave danger to public health if such contaminated meat or meat product is consumed. Forty one (41) self completed and closed ended questionnaires were returned by respondents selected randomly amongst personnel and meat handlers in Gwagwalada abattoir. The questionnaire was pre-tested for validity prior to administration and was divided into four sections including demographic section, personal hygiene, general hygiene and issues concerning training. The data was presented in tables using percentages and frequencies. Thirty four (82.9%) of the respondents were males while 7 (17.1%) were females. Nineteen (46.3%) attended primary school, 14 (34.2%) attended secondary school while 8 (19.5%) were higher school graduates. According to work designation, butchers were 6 (14.6%), meat vendors were 31 (75.6%) and meat inspectors were 4 (9.8%). Twelve (29.3%) of the respondents spent less than 5 years in the abattoir, 24 (58.5%) have spent between 5 – 10 years while only 5 (12.2%) spent above 10 years. The results of perception on personal and general hygiene were not very satisfactory. Five (87.8%) and 7 (82.9%) admitted not washing their hands before slaughter and not wearing protective covering during slaughter respectively. Thirty eight (92.7%) indulged in self medication. It also indicated that most of the meat handlers (95.1%) received no basic training on hygiene hence the need for education by way of training and workshops targeted at improving the personal and general hygiene of the meat handlers and the abattoir environment. This if effectively monitored will highly minimize or drastically reduce some of the unhygienic practices in the abattoir thereby ensuring meat safety to human consumers.

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INTRODUCTION

The maintenance of proper hygiene and adequate sanitary conditions is paramount in any meat-processing plant. Many factors have been attributed to the increasing incidence of food borne diseases including population growth, changes in food preparation habits, a rise in the number of food-service establishments, increased consumption of food outside the

home and lack of food safety training and education among consumers and food handlers (Motarjemi and Kaferstein, 1999). Worker mishandling of food is one of the major causes of food borne disease outbreaks (WHO, 2000). In a study in Ethiopia, Haileselassie *et al.*, (2013) revealed that there was a reasonable gap on food safety knowledge by abattoir and butcher shop workers. Each year, unsafe food makes at least 2 billion people ill worldwide, or about one third of the global population (National Institute for Allergies and Infectious Diseases, 2007). There are more than 250 known food-borne diseases caused by bacteria, viruses or parasites (National Institute for Allergies and Infectious Diseases, 2007).

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In abattoir operation, certain prerequisite programmes have to be considered to provide basic environmental and operating conditions that are necessary for production of safe food (Lawan *et al.*, 2013). These prerequisite programmes include good manufacturing practices, good hygiene practices and standard operating system (Declan *et al.*, 2004). For public health purposes, an abattoir has been defined as a premise approved and registered by the controlling authority for hygienic slaughtering and inspection of animals, processing and effective preservation and storage of meat products for human consumption (Alonge, 1991; Codex Alimentarius, 1993). The slaughter practices in an abattoir contribute significantly to the keeping quality of meat both in the abattoir and in the retail outlets. The purpose of an abattoir is to produce hygienically prepared meat by the humane handling of the animal using hygienic techniques for slaughtering and dressing (FAO, 1992). Hygiene problems are not limited to slaughtering but are also associated with incorrect processing, marketing and other practices (Akinro *et al.*, 2009). Good hygienic state of the abattoir or slaughter house is therefore very necessary to eliminate likely zoonotic microorganisms and make the quality of meat presented for sale and consumption reasonably healthy. Foods prepared without following hygiene rules result primarily in food poisoning and many other diseases that have negative effects on human health (Sanlier and Turkman, 2010).

Under tropical conditions, food of animal origin tends to deteriorate more rapidly and become an important vehicle for gastro intestinal infections thereby endangering consumer's health (Akinro *et al.*, 2009). One of the major risks of food contamination originates from the working practices of food handlers and disease causing microorganisms present in or on the food handlers' body and are subsequently transported from the handler to the food during the handling process (Gordon-Doris, 1998). To present wholesome meat to consumers, the personnel in the abattoir must present themselves in the most acceptable hygienic conditions. Therefore it is of utmost importance that the hygienic practices are employed in an abattoir during skinning and evisceration to ensure that bacteria counts are kept as low as possible (Lawrie, 1998).

Frazier and Westhoff (1998) reported that humans shed about $1 \times 10^3 - 1 \times 10^4$ viable micro organisms per minute and a relationship exists between the numbers and types of such organisms and the working environment. An estimated one in every 50 abattoir food handlers sheds around 10 pathogens per gram of faeces without showing any clinical manifestation of the related illness (Frazier and Westhoff 1998). Subsequently, poor personnel hygiene practices such as negligence to wash hands after visiting the bathroom may result in up to 10^7 pathogens under the finger nails of the food handler (Forsythe, 2000). According to Nottingham (1982), the hides, skins, faecal materials and soil are the major sources of microorganisms. Meat is a high-risk food with studies showing a strong correlation between meat consumption and disease outbreaks necessitating improved control (Hilton, 2002). Microbial contamination of meat and meat products must not exceed levels which could adversely affect the shelf life of the product; if it does, it renders the meat unwholesome and hence not fit for human consumption (Fasami and Sanusi, 2008). Organisms originating from infected food handlers include *salmonella spp*, *shigella spp*, *eschirichia coli*, *staphylococcus aureus*, *bacillus cereus* and *faecal streptococci* (Lawrie 1998).

Due to the fact that disease outbreaks often lead to economic losses, food handler training is an important business strategy for managing food safety risks. Food handler training according to Smith, (1994) is seen as one strategy by which food safety can be increased, offering long-term benefits for the industry. The general hygiene in the abattoir will encompass the sanitary state of the environment within which the slaughter takes place and within which the staff operate, the house, equipment and other facilities such as toilets and baths. The personnel hygiene comprises the quality of staff members and other casual workers in the abattoir. It includes their health, hygiene and habits. Personnel hygiene is defined by John (1991) as clean as is reasonably practical of hands, forearms, neck, hair, and any clothing liable to come into contact with food. This study was carried out to assess the knowledge, attitude and practices of the meat handlers regarding personal and general hygiene so as to ascertain the need for training with regards to hygiene and general of management of the abattoir.

MATERIALS AND METHODS

Gwagwalada abattoir is located in Gwagwalada Area Council of Abuja and lies between latitude 8° and $9^{\circ} 25'$ N of the equator and longitude $6^{\circ} 45'$ and $7^{\circ} 45'$ E of Greenwich (Balogun, 2001). The personnel in Gwagwalada abattoir were interviewed by means of a structured closed ended questionnaire to ascertain the level of both personal and general hygiene practices in the abattoir. The questionnaire was pre-tested for validity and clarity prior to administration to respondents. The questions were put in simple, concise and specific manner to prevent ambiguity (Katzenellonbogen *et al.*, 1997). The interviewer ensured that the respondents understood the objectives and importance of the study. A total of 43 self completed questionnaire were returned out of the 55 distributed to participants in Gwagwalada abattoir. Some of the incomplete questionnaires (2) were discarded making the sample size to be 41 respondents. The questionnaire was divided into four sections namely:-

- Demography
- Personal hygiene
- General hygiene and
- Issues concerning training

The questionnaire was analyzed by hand using an earlier drawn code list and data capturing sheet. Simple Yes or No answers were employed to ascertain the perception on personal hygiene and training while Daily, Weekly and Rarely were used on the general hygiene perception. The data was presented in tables using percentages and frequencies.

RESULTS

The characteristics of participants captured under demographic information are shown in Table I. Thirty three (80.5%) of the 41 respondents were male and 8 (19.5%) were female. According to Educational qualifications, 20 (48.8%) attended primary school; 12 (29.2%) attended secondary school and 9 (22%) attended higher schools which included any studies above secondary education. Butchers constituted 7 (17%) of the respondents; meat vendors constituted 30 (73.2%) of the respondents while meat inspectors including Veterinary officers were 4 (9.8%).

Table 1. Demographic information

Characteristics n= 41	Frequency (n)	Percentage (%)
Gender		
• Male	32	80.5
• Female	8	19.5
Educational status		
• Primary school	20	48.8
• Secondary school	12	29.2
• Higher school	9	22
Work designation		
• Butchers	7	17
• Meat vendors	30	73.2
• Meat inspectors	4	9.8
Work experience		
• <5 years	11	26.8
• 5 – 10 years	25	61
• >10 years	5	12.2

Table 2. Perception on Personal hygiene

Personal hygiene	Frequency (n)		Percentage (%)	
	Yes	No	Yes	No
Washing of hands				
• Wash hands before slaughter	5	36	12.2	87.0
• Wash hands after slaughter	41	0	100	0
• Wash with soap always	33	8	80.5	19.5
• Dry hands with towel after	11	30	26.8	73.2
Wearing apron and other covering				
• Wear apron during slaughter	7	34	17.1	82.9
• Wear gumboots during slaughter	4	37	9.8	90.2
• Use hand gloves	2	39	4.9	95.1
Issues of personal health				
• Fall sick often	1	40	2.4	97.6
• Report illness to Authority	0	41	0	100
• Indulge in self medication	38	3	92.7	7.3
• Consults the Doctor	3	38	7.3	92.7

The number of years spent in the abattoir was also considered and 11 (26.8%) of the respondents spent less than 5 years; those that spent between 5-10 years were 25 (61%) while those above 10 years in the abattoir were 5 (12.2%). On the personal hygiene perception (Table 2), 5 (12.2%) agreed that they washed their hands before handling meat while 36 (87.8%) did not observe hand washing before meat handling. All the respondents were in the affirmative that they washed their hands after slaughter operations. Thirty eight (92.7%) of the respondents accepted indulging in self medication while 3 (7.3%) claimed to consult doctors. The general hygiene perception as shown in Table 3 indicated that the 41 respondents agreed that water is readily available in the abattoir and it is used cold. The whole respondents also agreed to washing of equipment and slaughter slab after usage but not before. 18 (43.9%) agreed that the toilets were washed daily; 20 (48.8%) said the toilets were washed on weekly basis while 3 (7.3%) agreed that the toilets were rarely washed, 4 (9.7%) were of the opinion that the wastes were disposed on daily basis while 11 (29.6%) and 26 (63.4%) agreed to a weekly and rarely disposal rates respectively. Table 4 dealt on issues concerning the perception on training of meat handlers. Only two (4.9%) agreed to have ever received training while 39 (95.1%) disagreed to have received. They all expressed interest to be trained by government as they cannot afford self sponsored training.

Table 3. Perception on General hygiene

General hygiene	Frequency (n)			Percentage (%)		
	Daily	Weekly	Rarely	Daily	Weekly	Rarely
Availability of water	41	0	0	100	0	0
Use hot water	0	0	41	0	0	100
Use cold water	41	0	0	100	0	0
Availability of soap	26	10	5	63.4	24.4	12.2
Washing of protective clothing	1	2	38	2.4	4.9	92.7
Cleaning of equipment after use	41	0	0	100	0	0
Cleaning slabs before slaughter	0	0	41	0	0	100
Cleaning slabs after slaughter	41	0	0	100	0	0
Sweeping/cleaning compound	20	16	5	48.8	39.0	12.2
Washing of toilets	18	20	3	43.9	48.8	7.3
Frequency of waste disposal	4	11	26	9.7	29.6	63.4

Table 4. Perception on Training of Meat handlers

Training	Frequency (n)		Percentage (%)	
	Yes	No	Yes	No
Ever received training	2	39	4.9	95.1
Any need for training	41	0	100	0
Afford self sponsored training	3	38	7.3	92.7
Need government sponsorship	41	0	100	0
Satisfied with hygienic in abattoir	0	41	0	100
Any need for improvement	41	0	100	0

The 41 respondents were of the opinion that the hygienic state of the abattoir was poor and needs to be improved.

DISCUSSION

Food-borne diseases present a serious threat to public health. Such diseases are due to the consumption of food contaminated with microorganisms or their toxins (Hugas and Tsigarida, 2008). Zoonotic diseases are not only transmissible to humans through contact with animal body fluids but also through the ingestion of contaminated meat (Norrung and Buncic, 2008). The incidence and prevalence of food-borne diseases can be reduced significantly if food handler's knowledge, attitude and practices were improved. Roberts and de Jager (2004) described abattoir as one of the food industries that contribute to the problem of food-borne diseases and potential health hazards associated with food unless the principle of food hygiene is implemented. This is corroborated in this work owing to lack of awareness on the part of meat handlers on the routine hygienic practices required in their work place. Marriot (1999) reported that poor food hygiene practices can contribute to outbreaks of food borne illnesses. For the achievement of improved food safety for consumers, abattoir personnel and environment including compound and surroundings need to be cleaned on regular basis. The perception on personal hygiene indicated that all respondents admitted washing their hands after slaughter while only 5 (12.2%) agreed to washing before slaughter. Thirty three (80.5%) agreed that they use soap always while washing. Hand washing is very important hygienic precautionary measures for every public health workers. Vanyl (1995) suggested that soap and hot water at 45oc should always be available at the washing basins for meat handler's use. The use of paper towel sheets rather than fabric cloths, dish towel or apron for hand cleaning should be encouraged as micro-organisms can easily accumulate on such materials (Marriot, 1999).

Concerning the wearing of apron and other coverings, 34 (82.9%), 37 (90.2%) and 39 (95.1%) accepted not wearing apron, gumboot and hand gloves respectively during slaughter. Since the purpose of wearing overalls is to protect both the food and the meat handler from cross-contamination, overalls suitable to wear over other clothing (Nel et al., 2004). All the respondents agreed that they never reported their illnesses while 40 (97.6) claimed not to fall sick often. Thirty eight (92.7%) of the respondents accepted indulging in self medication while 3 (7.3%) claimed to consult doctors. There is need for proper arrangement for health service delivery for abattoir workers considering the hazards associated with meat handling. The importance and advantage of having an on-site health services or clinics especially in large food handling establishment with large work force has been emphasized (Hobbs and Roberts, 1993). Food-borne diseases cause economic and social problems such as loss of income, loss of man power and medical care costs, For instance, Salmonellosis is estimated to cost the United States between 1613 and 5053 million dollars annually (Van der Heijden et al., 1999).

The human body is a reservoir for numerous micro organisms with hands being the main agents for cross-contamination with food handling establishment (Gordon-Davis, 1998; Muinde and Kuria, 2005); it is important that all possible measures be taken to reduce or eliminate such contamination (Muinde and Kuria, 2005). Gordon-Davis further explained that during food handling, disease causing micro-organisms may be transferred from a food handler's body to the food. Cross-contamination is the result of bacteria being transferred from a source, raw meat, work surfaces or equipment to the ready-to-eat food (Engel and MacDonald, 2001). Bacteria can be transferred directly, whereby the source touches the ready-to-eat food or indirectly through a worktop or an individual's hand. Ignorance, poor design and poor food handling by staff are some of the reasons why indirect contamination occurs (Engel and MacDonald, 2001).

On general hygiene perception, the respondents indicated that the slaughter slabs were washed daily after slaughter, a highly welcome routine procedure, although there is need for the slabs to be washed every morning before slaughter because animal food is always microbiologically contaminated by organisms living naturally or entering from surroundings or through operational procedures (Lewicki, 1993). The 41(100%) also agreed that water is readily available in the abattoir and equipment such as knives were washed after slaughter. All the respondents claimed that they would like an improvement in the hygienic state of the abattoir. Alonge (1991) defined meat hygiene as a system of principles designed to ensure that meat and products are safe, wholesome and processed in a hygienic manner fit for human consumption. The deplorable state of our abattoir and poor personal hygiene of meat handlers have been associated with food borne disease outbreaks. Attala and Kassem (2011) stated that bacteriological quality of meat products is strongly influenced by the prevailing hygienic condition during their production and handling. The perception on training of the meat handlers indicated that all the 41 (100%) respondents expressed interest to be trained by government as self sponsored training may be unaffordable. Adams and Moss (1997) reported that training of food handlers regarding the basic concepts and requirements of personal hygiene plays an integral part in ensuring safe products to consumers. In our abattoirs, butchers and meat handlers are self employed people

and may not be able to sacrifice their meager resources for training. Government either at the local or state level may have to be involved if not wholly but by subsidizing the cost. Such training should be carried out from time to time and with inducement if need be. Standard of practice habits have been linked with management attitudes towards training (Tebutt, 1992). Gnomes-Neves et al., (2011) conducted a survey on the knowledge of practice of 159 meat handlers in slaughter slabs in Portugal and posited that although majority of these candidates had achieved professional training, further training was deemed necessary. The study advised that such training should have a strong knowledge –practice connection and considered motivation factors.

Conclusion

The personal and general hygiene in Gwagwalada abattoir can be described as poor judging by the result of the questionnaire. For a wholesome meat to be presented to the market for consumption, the hygiene of both the meat handlers and the conditions of the environment in which the animal is slaughtered must be taken into consideration. The hygienic state in place in the abattoir is highly insufficient and a lot more needs to be done. The whole compound as well as the surroundings should be thoroughly cleaned on daily basis to control dirt that may serve as breeding ground for microorganism. The meat handlers, as a matter of rule, must wash their hands with soap and probably hot water before and after handling the meat. The toilets and baths should be washed twice daily while the provision of regular adequate water supply to the abattoir is very necessary. There is also need for education by way of regular training and workshops involving permanent staff, casual workers, butchers and other meat handlers. This will be targeted towards improving the personal and general hygiene of the abattoir environment. This, if effectively monitored, will highly minimize if not drastically reduce contamination thereby ensuring improved meat quality for human consumption.

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