



## Evaluation of Food Safety Knowledge, Attitudes and Practices among Abattoir Workers' in Khartoum State

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### ARTICLE INFO

#### Article history

Received: 15 July 2014

Accepted: 27 July 2014

Available online: 10 December 2014

#### Keywords:

Food hygiene,  
Safety knowledge, Attitudes,  
Practice

### ABSTRACT

This cross-sectional study was conducted to evaluate the knowledge, attitudes and practices of food workers in Khartoum State. A questionnaire was designed for random selection. Results indicated that the respondents had acceptable level of knowledge, excellent attitudes and poor practices toward food hygiene measures. They were asked about brucellosis, diarrhoea, and typhoid and their answers with correct option 80.0%, 75.7% and 56.7% respectively. Almost all of the participants (90-93.3%) agreed with various statements in the attitude part of the questionnaire. Good hygienic practices of food workers revealed that 93.3% wearing aprons, but 90% were agreed of using masks. The management of the slaughterhouse facilities should be used because they are responsible for maintenance of hygienic standards. Food will be safe and a number of food borne diseases will be eradicated.

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### INTRODUCTION

Contamination of meat carcasses has pointed to many sources including abattoir workers. The high incidence of food borne illnesses has led to an increase in global concern about food safety. According to Johns (1991) personal hygiene can be defined as follows: "as clean as is reasonably practical of hands, forearms, neck, hair and any clothing liable to come into

contact with food. Several food borne-disease outbreaks have been reported to have been associated with poor personal hygiene of people handling foodstuffs (Bryan, 1988; Altekruse *et al.*, 1998; Vought and Tatini, 1998; Shapiro *et al.*, 1999). Personal hygiene is critical in preventing contamination of food and food borne illness, they must wash their hands properly to prevent contaminating

other foods, and surfaces they touch (Medeiros *et al.*, 2001). There is approved association between slaughter practice and hygienic practice of the workers. The washing and disinfection with hot water rarely take place, and both hygienic disposition and easy access to hygienic facilities were important for hygienic behaviour in slaughterhouse (Gerats *et al.*, 1982). Hands, as well as contaminated gloves, serve as vectors for transmission of transient microorganisms (Fendler *et al.*, 1998). For many years there have been requirements regarding the clothing and personal hygiene of workers, if properly enforced, these should control contamination from workers' bodies (Restino and Wind, 1990; Kasprowiak and Hechelmann, 1992). All employees working in the slaughterhouses must wear hair nets, should wash their hands before and after breaks, visits to the toilets and as necessary during production, clean and sanitize gloves, knives, aprons as necessary during production to minimize contamination and all equipment and tables are cleaned and sanitized throughout the day (Brendan *et al.*, 2009). Morrone and Rathbun (2003) indicated that risks along the food chain can be minimized through educating consumers and employees on safe food handling. Without knowledge of food safety practices and proper food handling procedures, food borne illnesses cannot be reduced (Redmond and Griffith, 2005). Gould (1994) reported that all food handlers must have participated in a training programme in personal hygiene, good manufacturing practice, cleaning and disinfection procedures before starting to work in the plant. Training helps to improve overall employee knowledge of food safety (Howes *et*

*al.*, 1996; Costello *et al.*, 1997; Finch and Daniel, 2005; Roberts *et al.*, 2008) although others have found that training is not consistently associated with improved knowledge (Luby *et al.*, 1993). In Sudan, Siham and Abdalla (2010) recorded that all persons in contact with food and food products must know hygienic practices during their duty to prevent the food and its products from contamination. Also Ali (2007) reported that proper application of systemic hygienic practices, the food can be safe from many foods borne diseases. The aim of this study was to assess food safety knowledge, attitudes and practices among abattoir workers' in Khartoum state

## **MATERIALS and METHODS**

### **Study area:**

This survey was conducted from December 2012 to February 2013 in one of the private slaughterhouses which is utilized for export of mutton in Khartoum State.

### **Questionnaire:**

Questionnaires were composed of 30 workers who directly involved in slaughtering process in the abattoir. Each questionnaire comprised distinct parts; food hygiene knowledge, attitudes and practices. In the knowledge part, there were close-ended questions emphasizing personal hygiene, cross contamination, microbiological food hazards and specific food borne diseases. Each question was provided by three possible answers (true, false and do not know). Subsequent part of the questionnaire was dealing with the attitudes of the responders about various hygienic measures for food safety. The handlers were asked to indicate their level of agreement to the statements using a three-point rating scale (agree, disagree and no idea). Practices of food workers

were assessed by their self-reported hygienic behaviours in the last part of the questionnaire. In this part questions were provided with five-point rating scale (never, rarely, sometimes, often and always). Two additional questions concerning how often they consume or recommend the products of their working plants were also included in this part. The questionnaire was pilot tested on 10 abattoir workers' and amended for clarity with the addition of some answer options. Although the questionnaire was intended to be self-administered, some illiterate workers needed help in filling it.

#### **Statistical analysis:**

Statistical analysis was conducted using SPSS software for windows, version 11.5. Descriptive statistics were provided and Spearman's correlation coefficient was used to test the association between knowledge, attitudes and practices scores. *P*-value less than 0.05 were considered as statistically significant.

#### **RESULTS**

Thirty slaughterhouse workers were participated in this study. Considering food workers' knowledge, almost all of them were aware of the critical role of general sanitary measures in the work place such as washing hands, using gloves, caps and aprons and proper cleaning of the instruments (Table 1). Diarrhoea, bloody diarrhoea, brucellosis and typhoid were answered with correct options by 76.7%, 60.0%, and 56.7% of respondents, respectively. However, the correction responses of jaundice and abortion were generally low, ranging between (73.3% and 53.3%). The knowledge of the study population about microbiological food hazards was generally lower than their knowledge of diseases. Their correct responses for

Salmonella, Hepatitis A virus, Hepatitis B virus, Staphylococcus and Clostridium were 73.3%, 76.7%, 70.0%, 58.6% and 63.3%, respectively. Two questions were about the knowledge of respondents for necessity to take leave during infectious diseases of eye and skin. Their correct responses were 76.7% and 93.3%, respectively (Table 1).

Almost all of the participants (90 to 93.3%) agreed with various statements in the attitudes part of the questionnaire. Small percentages were disagree (1–2%) or did not have any idea (1–5%) about some of the statements (Table 2).

Good hygienic practices of food workers evaluated, in results ( Table 3) were indicated that 93.3% of the respondents always wear aprons, while corresponding measures for using gloves and washing hands before it were 56.7%. Two to three percent reported that they never use gloves or wash their hands.

About 20% of the respondents reported that they always use masks and 46.7% stated that they never use masks during their work. Whereas, 17 of the workers were not drinking or eating in work place and 10% reported that they always eat or drink in their work place. Considering smoking in the work place, 14 of them indicated that they never smoke. Approximately 85.6% of respondents reported that they always or often recommend the products of their plants, but only 50.5% reported that they always or often consume their products by own.

There was positive correlation between knowledge and attitude ( $r_s = 0.35$ ,  $P < 0.001$ ); however, knowledge and practices ( $r_s = -0.20$ ,  $P = 0.04$ ) as well as attitudes and practices ( $r_s = -0.25$ ,  $P = 0.01$ ) were negatively associated.

**Table 1: Food safety knowledge of 30 food workers at abattoir in Khartoum state**

Statements	Responses, n (%)		
	True	False	Do not know
Washing hands before work reduces the risk of food contamination	28(93.3)	2(6.7)	
Using gloves during work reduces the risk of food contamination	27(90)	1(3.3)	2(6.7)
Proper cleaning and handling of instruments reduces the risk of food contamination	28(93.3)	2(6.7)	
Eating and drinking in the work place increases the risk of food contamination	23(76.7)	1(3.3)	6(20)
All persons, including children, adults, pregnant women and old-ages are at equal risk for food poisoning	15(50)	6(20)	9(30)
Typhoid can be transmitted by food	17(56.7)	4(13.3)	9(30)
Jaundice can be transmitted by food	22(73.3)	2(6.7)	6(20)
Diarrhoea can be transmitted by food	23(76.7)	4(13.3)	3(10)
AIDS can be transmitted by food	12(40)	4(13.3)	14(46.7)
Brucellosis can be transmitted by food	24(80)	4(13.3)	2(6.7)
Bloody diarrhoea can be transmitted by food	18(60)	6(20)	6(20)
Abortion in pregnant women may be induced by foodborne disease	16(53.3)	4(13.3)	10(33.3)
Salmonella is among the foodborne pathogens	22(73.3)	4(13.3)	4(13.3)
Hepatitis A virus is among the foodborne pathogens	23(76.7)	2(6.7)	5(16.7)
Hepatitis B virus is among the foodborne pathogens	21(70)	3(10)	6(20)
Staphylococcus is among the foodborne pathogens	17(58.6)	5(17.2)	8(24.2)
<i>Clostridium botulinum</i> is among the foodborne pathogens	19(63.3)	4(13.3)	7(23.3)
The correct temperature for refrigerator is	24(80)	6(20)	
During infectious disease of skin, it is necessary to take leave from work	28(93.3)	1(3.3)	1(3.3)
During infectious disease of eye, it is necessary to take leave from work	23(76.7)	3(10)	4(13.3)

**Table 2: Food safety attitudes of 30 food workers at abattoir in Khartoum state**

Statements	Responses, n (%)		
	Agree	Disagree	No idea
One of the most important responsibilities of the food handlers is washing hands to food safety measures	23(76.7)	6(20)	1(3.3)
Using gloves is important in reducing risk of food contamination	25(83.3)	5(16.7)	0.00
Using apron is important in reducing risk of food contamination	25(83.3)	5(16.7)	0.00
Using masks is important in reducing risk of food contamination	27(90)	1(3.3)	2(6.7)
Using caps is important in reducing risk of food contamination	24(80)	4(13.3)	2(6.7)
Food handlers who have abrasions or cuts on hands should not touch foods without gloves	28(93.3)	2(6.7)	0.00
Raw and cooked foods should be stored separately to reduce risk of food contamination	26(86.7)	4(13.3)	
Food hygiene training for workers is an important issue in reducing risk of food contamination	27(90)	2(6.7)	1(3.3)
It is necessary to check the temperature of the refrigerator periodically to reduce risk of food contamination	28(93.3)	2(6.7)	0.00
Health status of the workers should be evaluated before employment	25(83.3)	4(13.3)	1(3.3)
Foodborne illnesses can have deleterious health and economic effects on the society	26(86.7)	2(6.7)	2(6.7)

**Table 3: Food hygienic practices of 30 food workers at abattoir in Khartoum state**

Statements	Responses, n (%)				
	Never	Rarely	Sometimes	Often	Always
Do you use gloves during work?	10(33.3)	2(6.7)	2(6.7)	0.00	16(53.3)
Do you wash your hands before using gloves?	9(30.0)	4(13.3)	0.00	0.00	17(56.7)
Do you wear apron during work?	1(3.3)	0.00	0.00	1(3.3)	28(93.3)
Do you use mask during work?	14(46.7)	2(6.7)	6(20)	2(6.7)	6(20)
Do you use cap during work?	17(56.7)	2(6.7)	4(13.3)	1(3.3)	6(20)
Do you wash your hands before you touch raw meat?	12(40)	2(6.7)	1(3.3)	2(6.7)	13(43.3)
Do you wash your hands after you touch raw meat?	10(33.3)	0.00	3(10)	1(3.3)	16(53.3)
Do you wash your hands after rest time when you come back to work?	10(33.3)	3(10)	0.00	1(3.3)	16(53.3)
Do you eat or drink in your work place?	12(40)	0.00	0.00	1(3.3)	17(56.7)
Do you smoke in your work place?	14(46.7)	1(3.3)	2(6.7)	4(13.3)	9(30)
How often do you use the products of your working plant?	7(23.3)	3(10)	1(3.3)	2(6.7)	17(56.7)
How often do you recommend the products of your working plant to others?	4(13.3)	2(6.7)	4(13.3)	0.00	20(66.7)

## DISCUSSION

In the present study the respondents (Table 1) have high knowledge in washing hands, wearing of gloves, aprons, mask, caps and proper cleaning and handling of instruments which reduce the risk of contamination and this leading to reduction of transmission of food borne diseases (Feglo and Nkansah,

2010; Elhaj *et al.*, 2012; Magda *et al.*, 2012). Our results revealed that 90% of the persons participated in the questionnaires food hygiene training for the workers is important in reducing food contamination, this results in agreement with the results of Hows *et al.*, (1996) and Abdalla *et al.*, (2009)

who stated that education of abattoir workers and meat handlers is important that providing wholesome and safe meat for consumers. Also 86.70% of them have knowledge that food borne illness can harm health and economic loss in the society (Jones and Angulo, 2006). The overall attitudes of the food handlers in our study know well food safety managements, but there is significant negative association between correct handling of food and food borne diseases prevention (Bas *et al.*, 2006). In this results (table 3) food hygienic practice are low, which indicated that proper personal hygienic practices is not implemented. But Siham and Abdalla, (2010) who explained that all persons working in contact with food and food products must be adhered to hygienic practices while on duty to prevent corruption of product. Also, the application of proper and systemic hygienic practices, food will be safe and a number of food borne diseases will be eradicated (Ali, 2007). In conclusion, the management of the slaughterhouse facilities should be used because they are responsible for maintenance of hygienic standards.

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