

# Assessment of Hygienic Quality of Food, Food Handlers and Restaurant Environments in Makkah, Hajj 1428 H.

Large numbers of pilgrims visit Makkah for Hajj and Umrah throughout the year, where they obtain foods from local restaurants and cafeterias. The main purpose of this observation-based cross-sectional study was to investigate hygienic conditions of these food facilities, food handlers in the facilities, and identify possible food poisoning risk factors during Hajj 1428 H.

The study population included all the food facilities located within one kilometer area around AlHaram, and their workers. Two stage random sampling based on geographical mapping was done. Sixty one (61) food facilities were selected, 38 (62.3%) restaurants and 23 (37.7%) fast food/cafeterias. All had a valid food preparation license. Over 90% prepared food throughout the year.

Good condition of the entrance was seen in only 26% of facilities, and the internal cleanliness of 26.2% was poor. An operational UV insect killer was found in 57.4%. Hand washing facility for staff was available in 80%. However, flies were observed in 41%, poor cleanliness of the food cooking area was observed in 34%.

Food halls were available in 74%, and floors were clean in 55%. More than 90% provided tables and chairs for the customers, 82% of which were in good condition. The majority (95%) provided at least one wash basin for customers, and fewer than 50% had a customer's washroom (WC).

The majority of food handlers (90%) had valid health certificates. However, 67% had not been wearing gloves while preparing food, 45% had dirty nails, 14% had boils/cuts on their hands, and 10% had experienced diarrhea in the previous 24 hours.

There was no significant difference between general characteristics of facility, food serving and food handlers between restaurants and fast food/cafeterias. None of the microbiological results of the food samples and nails swabs were positive.

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**Editorial notes:** Food-borne illness remains an important public health problem worldwide. Epidemiological research indicates that the majority of food-borne illness outbreaks originate in food service establishments, and are attributed to food handlers and improper food preparation practices.<sup>1,2</sup>

Foodborne outbreaks during hajj can be particularly disastrous. This study sheds light on the characteristics of food facilities, hygienic quality of the food and food handlers in Makkah during Hajj 1428 H. The main positive finding was that all the surveyed facilities had a valid food preparation license. However, conditions of the facility entrance and internal cleanliness were generally poor.

Hand washing is one of the FDA's recommended prevention methods which can significantly reduce transmission of pathogens.<sup>3</sup> The fact that 20% of food service establishments did not provide hand washing facilities for kitchen staff reveals that the workers do not wash their hands between handling of raw meat, poultry and ready prepared food, which increases the risk of cross-contamination and spread of food born illnesses.<sup>3</sup> The unavailability of WC for workers and inadequate supply of disposable gloves aggravate this situation.

Ten percent of the food handlers did not have a valid health certificates. This could be due to the fact that managements of these food establishments recruit temporary staff because of the increased work load during Hajj, without giving thought to health certification. These workers, however, are usually untrained,

with no prior experience or knowledge of food handling and serving. The fact that 10% of the food handlers reported having had diarrhea in the previous 24 hours is also alarming. This, combined with the presence of hand boils, can potentially transmit infection to a large numbers of customers, and constitute a large potential risk factor for food poisoning.

It was recommended that restaurants and fast food shops/cafeterias provide adequate WC and hand washing facilities for their workers, ensuring a regular supply of gloves for food handlers. Regular visits from the health directorate and municipality of Makkah should be conducted to check internal and external cleanliness, food preparation/cooking areas, cooking and serving utensils, which should be intensified during hajj season. Food facilities should not be allowed to employ workers without valid health certification.

## References:

- 1- Laura GR, Selman C. Factors impacting food workers and managers safe food preparation practices. Food protection trends. 2005; 25 (12): 981-990.
- 2- Jones TF, Angulo FJ. Eating in Restaurants: A Risk Factor for Foodborne Disease. CID. 2006; 43:1324-1328.
- 3- Green LR, Radke V, Mason R, Bushnell L, Reimann DW, Mack JC, et al. Factors Related to Food Worker Hand Hygiene Practices. Journal of Food Protection. 2007;70(3):661-666.

**Table 1: Comparison between facilities of Restaurants and fastfood/cafeterias, Makkah, hajj 1428 H.**

General Cleanliness of areas of the food facility		Restaurant n=38	Fast food/ Cafeteria n=23	Total	P-value
Entrance	Good	10(26.3)	6(26.1)	16(26.2)	0.63
	Satisfactory	14(36.8)	11(47.8)	25(41.0)	
	Poor	14(36.8)	6(26.1)	20(32.8)	
Internal area	Good	13(34.2)	9(39.1)	22(36.1)	0.82
	Satisfactory	14(36.8)	9(39.1)	23(37.7)	
	Poor	11(28.9)	5(21.7)	16(26.2)	
Food preparation area	Good	14(36.8)	6(26.1)	20(32.8)	0.49
	Satisfactory	7(18.4)	7(30.4)	14(23.0)	
	Poor	17(44.7)	10(43.5)	27(44.3)	
Cooking utensils	Good	11(28.9)	6(26.1)	17(27.9)	0.63
	Satisfactory	12(31.6)	10(43.5)	22(36.1)	
	Poor	15(39.5)	7(30.4)	22(36.1)	