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# An assessment of the safety of street foods in the Ga district, of Ghana; implications for the spread of zoonoses

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## Abstract

Street food refers to food and beverages prepared and sold by vendors in streets and other public places for immediate consumption. In Ghana street foods are sold at small eating places popularly known as 'chop bars'. Food safety studies were conducted on the premises of 160 'chop bars' in the Ga District of Ghana in July 1998. Only three (1.8%) of the proprietors met all the requirements (based on a five-point checklist) for basic hygiene. Twenty-four (15%) out of the 160 proprietors had access to potable water while the other 136 (85%) proprietors purchased water from vendors and six used pond water. These two latter sources of water were of poor microbiological quality (as shown by faecal coliform values which ranged from  $1.0 \times 10^2$ – $1.9 \times 10^5$  cfu/ml). One hundred and five proprietors (65.6%) did not obtain their meat supply from an approved source. Factors influencing the purchase of meat from an approved source included the proximity of a chop bar to a slaughter facility, the conduct of meat inspection personnel and affordable user fees. © 2000 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

Food-borne illnesses remain widespread (Esray, 1990) but their impact on public health has not always been well documented, especially in developing countries (FAO/WHO Expert Committee on Food Safety, 1984; Bryan et al., 1988).

Ghana has a gross national product of about \$400 per capita, a high population growth rate and a significant rural-urban drift. The Ga District is one such peri-urban district experiencing this influx of people. In the southern sector of the district, near the cities of Accra and Tema, small local restaurants have sprung up providing what is termed 'street food'. According to WHO, street food refers to food and beverages prepared and sold by vendors in streets and other public places for immediate consumption (WHO, 1996). These form a significant component of the informal food distribution sector and they provide livelihoods

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for a large number of people, particularly women. There are two approved slaughter facilities in the district and foods of animal origin form a major component of dishes sold by street food vendors. Investigations have implicated street foods in outbreaks of foodborne disease (Tjoa et al., 1977). The Ga District is typical of many peri-urban districts, in that it has difficulty in controlling the proliferation and operation of large numbers of street food vending operations. In order not to disturb this important informal food sector by excessive regulation a culturally acceptable education package is required for the consumer, the vendor and the controlling authority (Bryan et al., 1988; Abdussalam and Kaferstein, 1993).

This study investigates the implications of food handling practices of selected chop bars in the Ga District in the spread of food-borne diseases.

## 2. Methodology

### 2.1. Study site allocation and chop bar selection

Study sites were distributed in the sub-districts, according to population density of settlements. The districts were: Amaaman (population, 87 482; eight sites), Danfa (population 22 809; one site), Madina (population 43 222; four sites), Obom (population 43 045; one site) and Weija (population, 39 530; three sites). The study sites for each

sub-district were selected (with the aid of maps) by random sampling and each was within 200 m of a selected road junction or lorry station. Four kinds of street food were selected for the study on the basis of their affordability, availability throughout the year, consumption by the majority of people in the district and general acceptability as breakfast, lunch and supper foods. The foods and the number of premises which offered them are as follows: khebab (beef or pork, spiced and roasted on open fire) (30), fufu (cassava, cooked, pounded and made into a paste) with soup (45), banku (cooked corn dough) with soup (60) and waakye (cooked mixture of rice and black-eye beans) with stew (25). Chop bars which, prepared and sold any of these foods, either to be eaten on site or taken away, were included in the study.

Proprietors were approached individually and were assured of anonymity. Standard checklists indicating poor practice were used by all interviewers in order to avoid differences. The interviewers remained on the premises while the food was being prepared, stored and/or sold and they observed the procedure employed by the food handlers.

### 2.2. Service area hygiene

The service area included the kitchen, dining area/selling point and a 5 m-wide area surrounding the structure. A five-point checklist was used

Table 1  
Check list of points used to assess the safety of street food in the Ga region of Ghana

Food type	Khebab ( <i>n</i> = 30)	Banku and soup ( <i>n</i> = 60)	Waakye ( <i>n</i> = 25)	Fufu and soup ( <i>n</i> = 45)	Total ( <i>n</i> = 160)
	Number defaulting (%)	Number defaulting (%)	Number defaulting (%)	Number defaulting (%)	Number defaulting (%)
Evidence of presence of animals	6 (20.0)	27 (45.0)	15 (60.0)	15 (33.3)	63 (39.4)
Absence of waste container with covers	29 (96.6)	56 (93.3)	24 (96.0)	45 (100.0)	154 (96.2)
Meat obtained from unlicensed sources	20 (66.6)	40 (66.6)	15 (60.0)	30 (66.6)	105 (65.6)
Displayed food unprotected from dust and flies	22 (73.3)	3 (5.0)	2 (8.0)	2 (4.4)	29 (18.1)
Evidence of food displayed (and served) next to a drain/toilet, refuse dump, or in pathways	7 (23.3)	11 (18.3)	7 (28.0)	3 (6.6)	28 (17.5)

as shown in Table 1. The observations were scored as 1 ('yes') or 0 ('no').

### 2.3. Meat and water source

The sources of both meat and water used at the facilities were ascertained by observation or by interview. The reasons given by the vendors for their inability to obtain meat from approved sources was ascertained by interview.

### 2.4. Laboratory analysis

Food and water samples for microbiological analysis were selected using the equal probability selection method (epsem). The microbiological quality of food and water samples was determined at the bacteriological laboratory of the Noguchi Memorial Institute for Medical Research (NMIMR). Total viable and total coliform counts were determined using methods of Bryan et al. (1988) and Desmarchelier et al. (1994).

## 3. Results

### 3.1. Service area hygiene

One hundred and sixty chop bars distributed throughout the study sites were investigated. One hundred and fifty four chop bars (96.2%) lacked waste containers with covers and 105 (65.6%) proprietors obtained meat from non-approved sources. There was evidence of the presence of animals on the premises of 63 (39.4%) of the chop bars. Twenty-eight (17.5%) proprietors displayed food next to a drain or toilet and 29 (18.1%) displayed food exposed to dust and flies (Table 1).

### 3.2. Water source

Only 24 (15%) of the proprietors used potable water directly from the tap. The other 136 (85%) obtained water sold by vendors and six also used water directly from ponds.

### 3.3. Meat source

Out of the 105 (65.6%) proprietors who did not obtain their meat supply from approved sources 41% claimed the relative inaccessibility of approved slaughter facilities as the most important reason for this. A total of 21.9% complained that the Ministry of Health and Veterinary fees charged for ante-mortem inspection of livestock were too high and unaffordable. The road distances of the chop bars from approved slaughter facilities ranged from 0.05 to 35 km. These were Amamsaman (2–12 km), Danfa (8–9 km), Madina (0.05–5 km), Obom (35 km) and Weija (16–18 km).

### 3.4. Microbiological study

The faecal coliform values ranged from  $7.9 \times 10^2$ – $1.6 \times 10^6$  cfu/g for foods purchased from the chop bars and from  $1.0 \times 10^2$ – $1.9 \times 10^5$  cfu/ml for water samples.

## 4. Discussion

The present study has established that only a small proportion (24/160) of food vendors obtained treated water for their operations. This was perhaps due to lack of planning in the siting of these chop bars. Both water sold by street vendors and pond water were potential sources of contamination as shown by their poor microbiological quality. A visit to one of the ponds revealed that animals (dogs, chickens, cattle, ducks and goats) frequently used these, suggesting they might act as a focus for transmission of diseases such as leptospirosis, *Clostridium perfringens* gastroenteritis, cryptosporidiosis, diarrhoea caused by enterohaemorrhagic strains of *Escherichia coli*, toxoplasmosis, campylobacteriosis and salmonellosis. The lack of an adequate supply of potable water for street vending operations has also been noted elsewhere (Bryan et al., 1988; Abdussalam and Kaferstein, 1993).

The lack of waste containers (with covers) in the premises of most of the chop bars (96.2%) was another major finding and resulted in food scraps

being thrown away by vendors, attracting stray animals. In addition some of the vendors kept domestic animals such as dogs, cats, poultry and small ruminants in their premises and these animals could also contaminate food and water used in the premises.

About one third of street vendors used meat from unlicensed sources. Among the main reasons given were distance from the slaughter-house (81%); 'exorbitant fees' (87%); theft of meat at the slaughter house (81%). Meat inspectors (from the Veterinary Services Department) also reported high user fees as a major complaint of butchers and others who patronised their services, a factor which encourages the home slaughter of livestock. Many animals are offered for food when their productive usefulness declined due to factors such as disease and old age. Illnesses due to the handling and consumption of un-inspected meat are therefore likely as has been documented elsewhere (Bryan et al., 1988; Mwenye et al., 1996; Wang et al., 1998). Details of abnormalities at ante-mortem and post-mortem inspection are therefore of epidemiological importance in associating outbreaks of disease in man with infections in animals (Watson, 1982). For example, the first indication of a human tuberculosis epidemic in Barbados was an increase in the prevalence of tubercular lesions in carcasses during post-mortem inspection. (Wilson and Howes, 1980).

Some of the street food vendors in our study also sold game meat. Ghana has no statutory requirements with regard to the inspection of game carcasses prior to sale. Anthrax has been diagnosed in various wildlife populations (De Vos and Bryden, 1996) and in 1996 the World Health Organisation reported an outbreak of Ebola in the village of Mayibout in Gabon (Office International des Epizooties, 1996) in which all the victims had been involved in the handling, butchering and eating of chimpanzee (*Pan troglodytes* spp).

In Ghana, possible diseases that might be transmitted to humans through un-inspected meat include anthrax, bovine tuberculosis, trichinellosis and taeniasis. The lack of knowledge about the risk of disease transmission was also evident as many respondents claimed that cooking would

destroy any harmful agents that might be in the meat and so it did not matter whether the carcasses were wholesome or not. It is therefore recommended that small and affordable slaughter facilities should be provided. Food vendors should also be trained and education programmes on food safety for consumers, food vendors and personnel of the controlling institutions provided.

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