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**RESEARCH ARTICLE**

**FOOD CONSUMPTION PATTERN OF GHANAIANS LIVING IN ACCRA AND LONDON**

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**ABSTRACT**

**Aim:** To compare food consumption pattern of a first generation Ghanaian population in London with an urban population in Accra, Ghana

**Methods:** Eighty participants aged 25-60 years were recruited in London and matched for age, gender and occupation to 160 participants in Accra. Dietary intake was assessed with a food-frequency checklist. A self-administered questionnaire was used to acquire information on health and lifestyle determinants.

**Results:** Consumption of most traditional Ghanaian staples, vegetables and cooking oils in London was less frequent. In addition, consumption of meat in London was significantly frequent in London while consumption of fish was lower. New foods had been adopted and substitutions of some foods were evident.

**Conclusions:** These differences suggest that migrants may adopt some habits of the host country that may be healthy and protective against cardiovascular disease risk but also develop other unhealthy habits that may have adverse effect on health

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**INTRODUCTION**

Migration, whether from a rural to urban area within a country, or from an urban to a more affluent country is a life event that may change lifestyle patterns especially diet and food habits (Goel *et al.*, 2004; Mohan, 2004). These changes in dietary patterns have nutritional and health implications with most studies showing an undesirable effect on diet (Holmboe-Ottesen 2000; Torun *et al.*, 2002). Epidemiologic studies have consistently shown that migrants to affluent areas arrive in good health but this tends to diminish with length of time (Goel *et al.*, 2004; Kaplan *et al.*, 2004). Most often there is a shift from a traditional eating pattern to an 'affluent diet' which is characterized by high amounts of fat, sugar and lower intakes of fruits and vegetables. This alteration in dietary composition coupled with sedentary lifestyle results in obesity and its consequences, which are the main nutritional issues concerned with migration in the developing world (Harding *et al.*, 2008; Gil *et al.*, 2005; Landmark and Cruiskshank, 2001).

Patterns of disease, both morbidity and mortality are different in minority ethnic groups in the United Kingdom (UK) and differ from the majority population. While South Asian groups in the UK have been identified with a higher risk of Coronary Heart Disease (CHD), populations of African origin have been identified with the highest mortality from stroke and end stage renal disease (Cappuccio, 1997; Wild and McKeigue, 1997; Balarajan, 1995). Dietary intervention strategies to prevent or treat these diseases rely on understanding of eating patterns and its effects on the nutritional status of these populations. It is imperative to study differences and the impact migration places on the dietary habits of groups of people considering its repercussions on chronic diseases. A study on the effect of migration on dietary intake among Ghanaians in Sydney found that the change in the dietary intakes of the Ghanaian migrants were consistent with an increased risk of type II diabetes and overweight (Saleh *et al.*, 2002). In the light of these observations, this study was carried out to compare the food habits of Ghanaians living in Accra (GA) and Ghanaian immigrants in London (GL). The aim of this research was to examine eating patterns of a first generation Ghanaian migrant population in London to determine how their dietary pattern affects their cardiovascular risk. In order to do this,

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comparisons were made with an urban population in Accra, Ghana their country of origin. Knowledge on dietary intakes of this population will provide useful information for dietary intervention in West Africans in the UK.

## MATERIALS AND METHODS

### Subjects

Data presented in this study formed part of a cross-sectional study which investigated the relationship between diet and cardiovascular risk factors in two Ghanaian populations: a first generation Ghanaian migrant population in London, and an urban population in Accra, Ghana, their country of origin. A total of 240 healthy participants (London: 80; Accra: 160) aged between 25 and 60 years were recruited from Ghanaian organisations in London and Accra. One participant from London was matched for age ( $\pm 2$  years) gender, and occupation with two participants from Accra. Participants were ineligible if they were diabetics, pregnant or lactating or had any major organ pathology. London participants were ineligible if they had resided in London for less than five years. All subjects gave informed consent on study protocol approved by the King's College London and University of Ghana Ethics Committees.

### Dietary Assessment

Questionnaires were used to obtain background information. Information collected included age, marital status, educational level, religion and ethnicity. Eating pattern information were also solicited. This included information on eating habits and use of dietary supplements.

of 150 commonly consumed foods that were identified from the Ghanaian food composition tables (Eyeson, 1975)) and also incorporated foods from a validated food frequency questionnaire for folate in the UK (Pufulete *et al.*, 2002). This consisted of a list of food items organized into food groups with a set of frequency of use and various response categories.

### Statistical analysis

Data was analysed using SPSS version 14. Chi square tests were used to compare categorical variables such as ethnicity, gender, educational level, marital status, occupation, supplement intakes and the food frequency check list..

## RESULTS

### Characteristics of the subjects

General characteristics of the study population are presented in Table 1. There were no significant differences in age, religion, ethnicity and occupation of participants from both cities. Compared to Accra participants, more than half of London participants had attained a significantly higher educational level ( $P=0.001$ ). Drinking of alcohol and use of multivitamins supplements containing folic acid was reported by a significantly higher proportion of subjects from London than Accra ( $P=0.001$ ). Comparisons among gender also showed that a significantly higher proportion of women from London consumed alcohol compared to women in Accra ( $P=0.05$ ). None of the participants in either location were current smokers.

**Table 1. Demographic characteristics of study participants**

	Men (n=43)	London Women (n=37)	All (n=80)	Men (n=86)	Accra Women (n=74)	All (n=160)
Age (yr.) mean(SEM)	37 (1.1)	39 (1.1)	38 (0.8)	37 (0.8)	37 (0.0)	37 (0.6)
<i>Educational level</i>						
Primary	3 (7)	4 (11)	7 (9)	12 (14)	12 (16)	24 (15)
Secondary	11 (26)	16 (43)	27 (34)	36 (42)	39 (53)	75 (47)
Tertiary	29 (67)	17 (46)	46 (57) <sup>**</sup>	38 (44)	23 (31)	61 (38)
<i>Occupation</i>						
Prof. & managerial	20 (47)	16 (43)	36 (45)	42 (49)	37 (50)	79 (49)
Skilled workers	5 (12)	11 (30)	16 (20)	9 (11)	18 (24)	27 (17)
Non skilled workers	13 (30)	3 (8)	16 (20)	25 (29)	11 (15)	36 (23)
Students	5 (12)	7 (19)	12 (15)	10 (12)	8 (11)	18 (11)
<i> ethnicity</i>						
Akan	33 (77)	28 (76)	61(76)	63 (73)	41 (55)	104 (65)
Ga	7 (16)	4 (11)	11 (14)	8 (9)	20 (27)	28 (18)
Ewes	3 (7)	5 (14)	8 (26)	11 (13)	13 (18)	24 (19)
Others	0 (0)	0 (0)	0 (0)	4 (5)	0 (0)	4 (3)
<i>Smoking</i>						
Current smoker	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Ex smoker	6 (14)	0 (0)	6 (14)	8 (9)	1 (1)	9 (10)
<i>Alcohol drinkers</i>	18 (42)	19 (51) <sup>†</sup>	37 (46) <sup>*</sup>	28 (33)	19 (26)	47(29)
<i>Use of supplements</i>	14 (33)	15 (41)	29 (36) <sup>**</sup>	5 (6)	14 (19)	19 (12)
<i>Length of stay(years)</i>						
Median (range)	6 (5 - 33)	8 (5 - 38)	6 (5 -38)	27(6-50)	30(5 -50)	29 (5-50)

Data is presented as n (%) unless otherwise stated.

In addition usual food intakes was assessed using a pre-tested food frequency checklist that was developed for a larger study in this population (Asante, 2006). The food checklist consisted

Mean weight, height, body mass index and waist circumference of participants from both locations were not significantly different, however, men from London were significantly

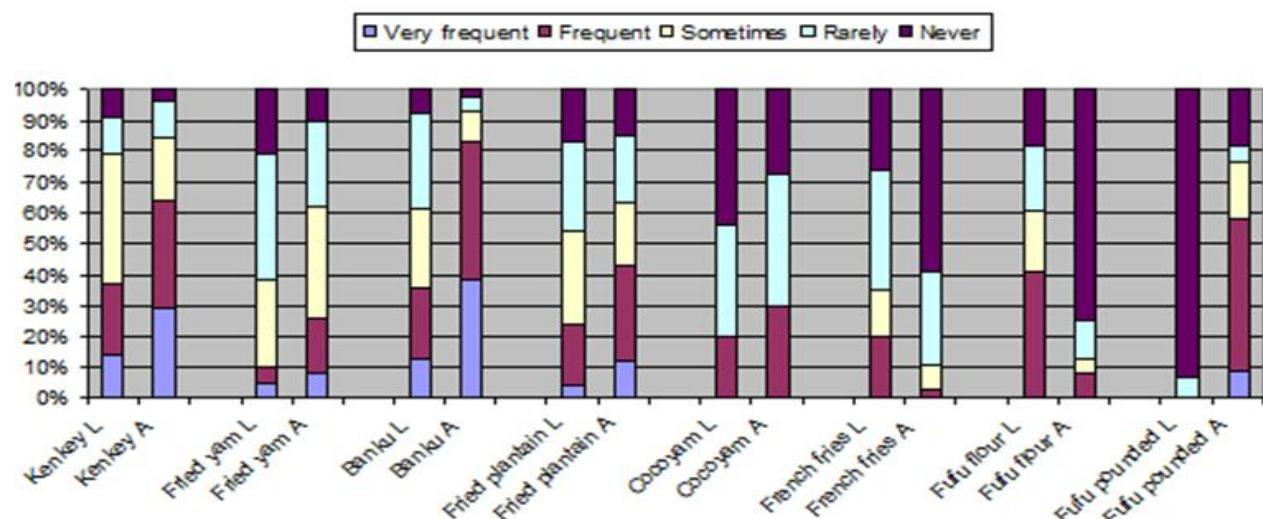


Fig. 1. Comparisons in frequency of consumption of selected staples

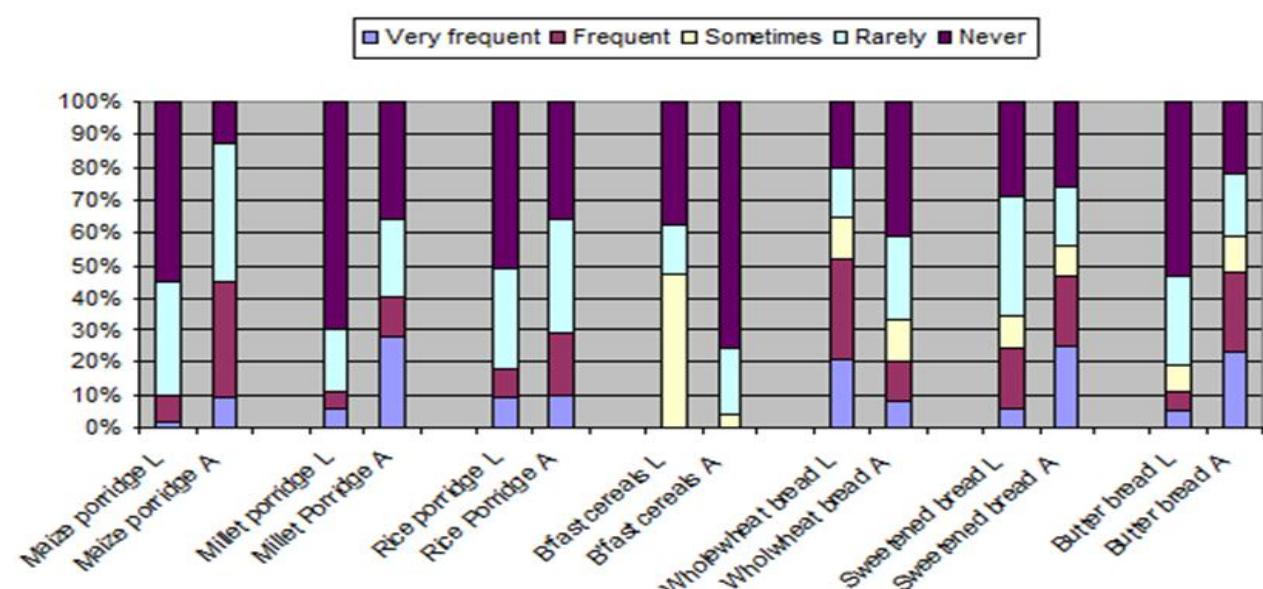


Fig. 2. Comparisons in frequency of consumption of cereals and breads

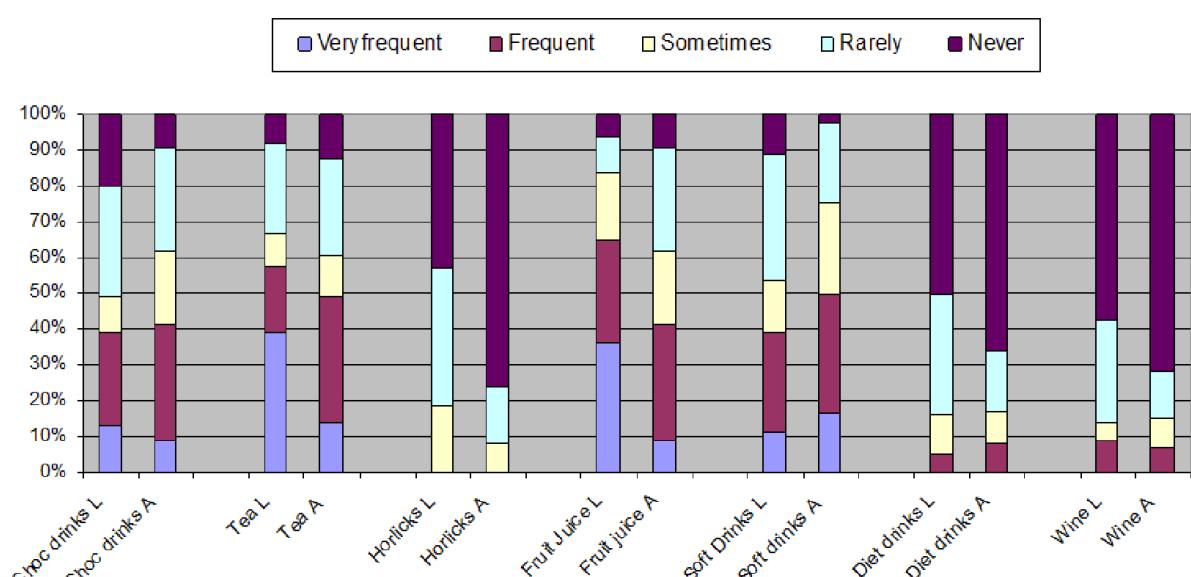
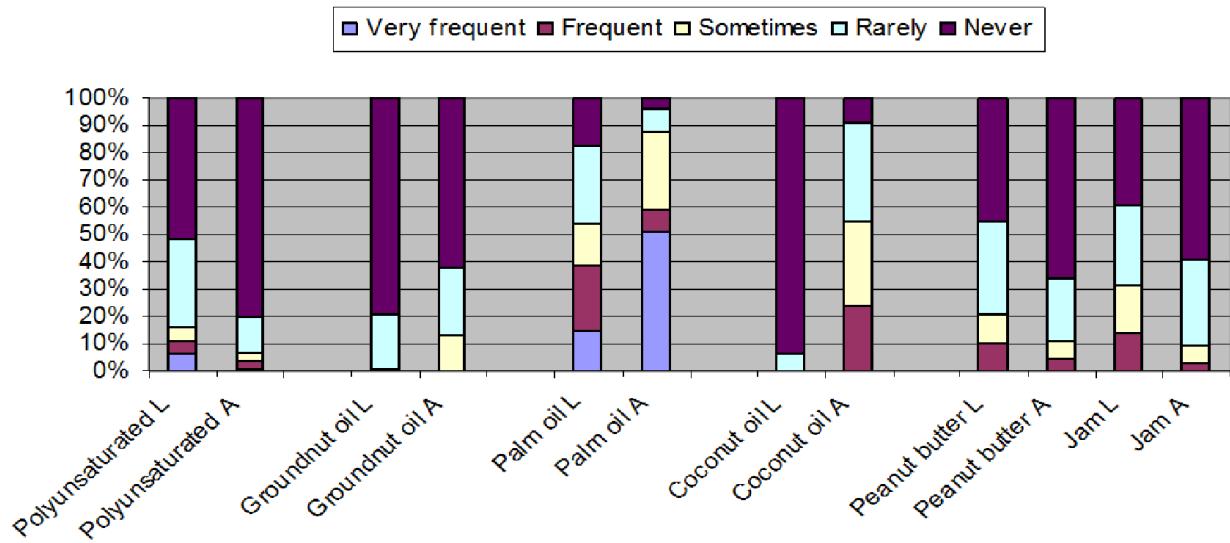
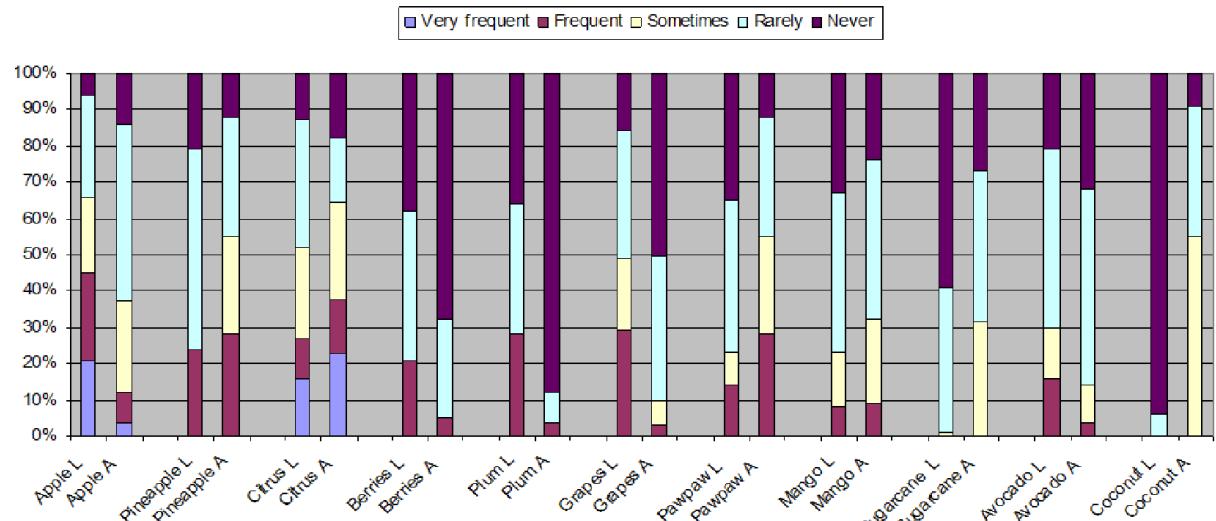


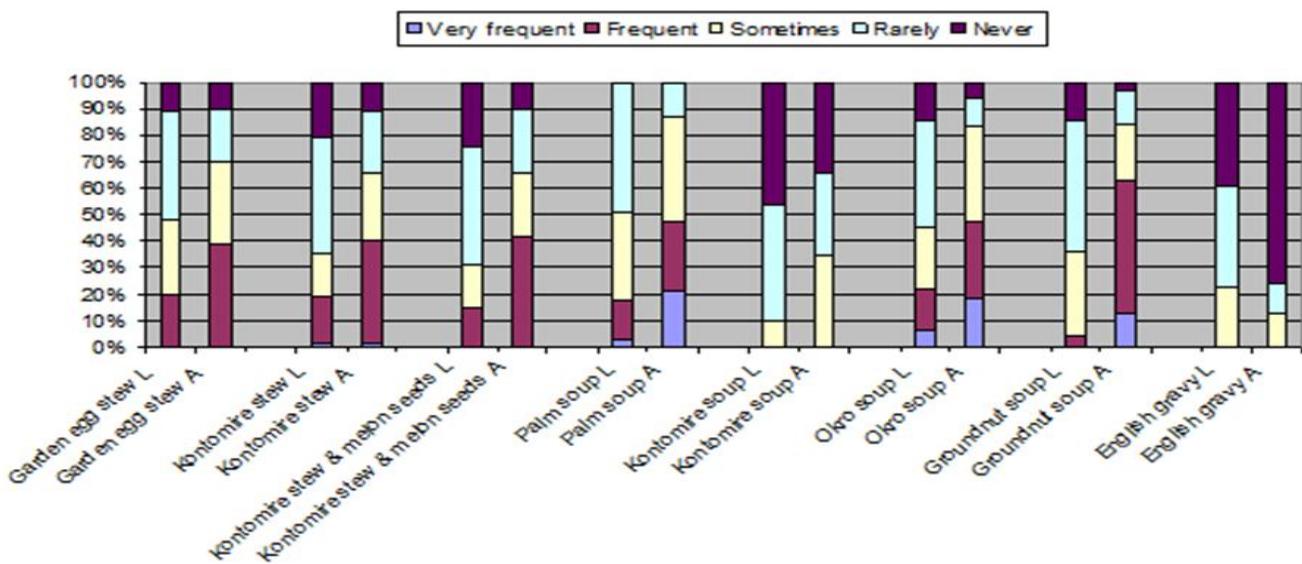
Fig. 3. Comparison in frequency of consumption of hot and cold drinks



**Fig.4. Comparison of the frequency of consumption of different types of fats spreads and oils**



**Fig.5. Comparison of the frequency of consumption of different fruits**



**Fig.6. Comparison of the frequency of consumption of Ghanaian stews and soups**

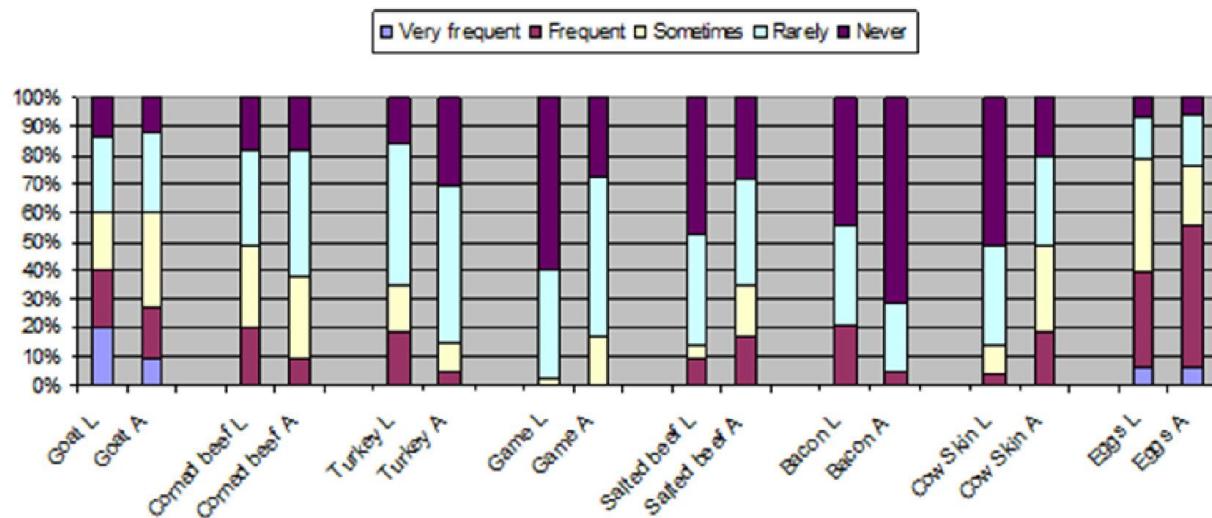


Fig.7. Comparison in the frequency of consumption of meat and meat products

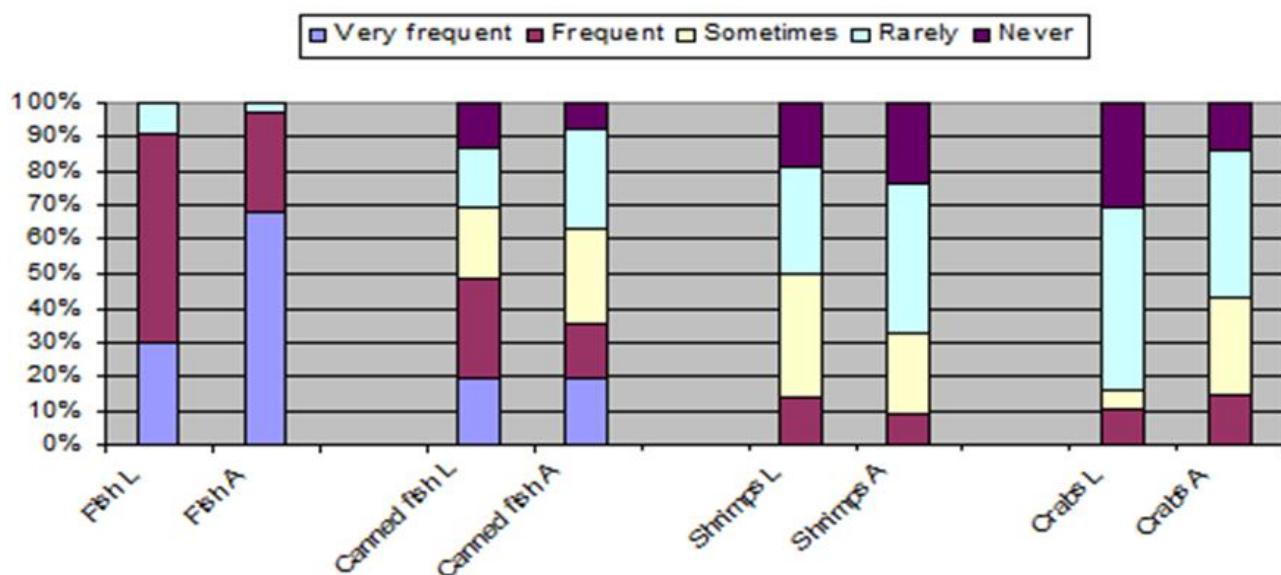


Fig. 8. Comparison in the frequency of consumption of fish and shellfish

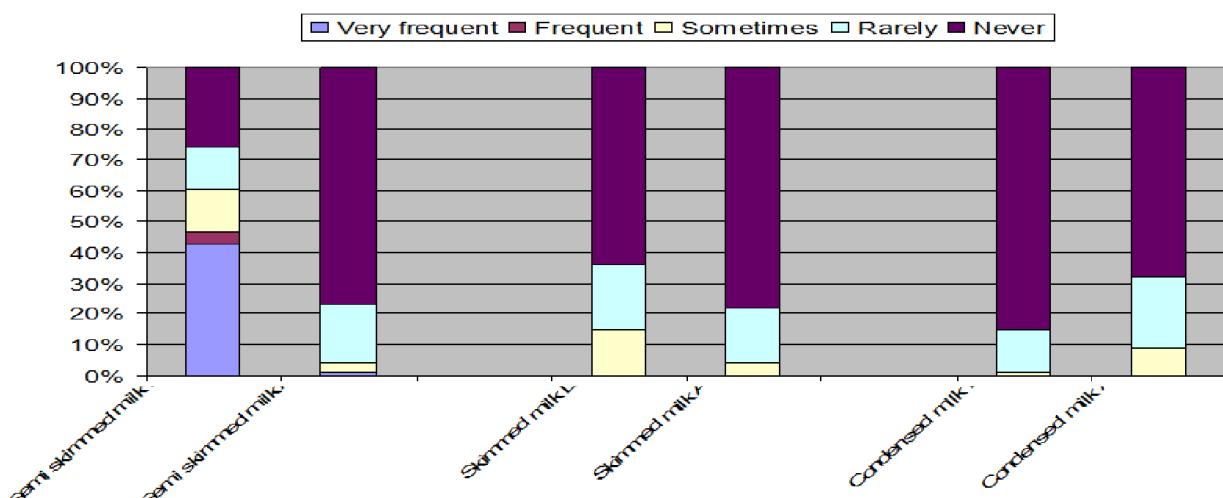


Fig. 9. Comparison in frequency of consumption of milk and milk products

heavier ( $P=0.02$ ) and had greater waist circumference ( $P=0.01$ ) compared to men from Accra. Significantly different when compared between London and Accra, Chi square test ( $^{**}P=0.001$ ,  $^*P=0.05$ , Tertiary education,  $P=0.001$ , Alcohol drinkers,  $P=0.001$ , Use of Supplements,  $P=0.001$ )

### Frequency of food consumption

Figures 1 -9 shows the differences in consumption of foods in London and Accra. Comparisons between the two locations showed some differences and similarities in eating patterns. Rice and fufu were major staples commonly consumed by majority of participants from each location. Frequency of consumption of white bread was also similar in London and Accra (42% vs. 40%, respectively). Differences were however noted in consumption of whole meal bread; compared with Accra significantly more participants from London reported frequent intakes (31% vs. 12%,  $P=0.001$ ). Weekly consumption of other traditional Ghanaian cereals and grains (maize and millet porridge, kenkey, banku) was less frequent in London compared to Accra. Other staples such as yam and plantains showed similar intakes in frequency of consumption. Breakfast cereals appeared to have replaced traditional porridges with nearly half of participants in London (48%) reporting intakes of once or twice a month compared to 5% in Accra (Figure 2). Some differences were also observed in consumption of hot and cold beverages. While tea and fruit juice were consumed very frequently by London participants ( $P=0.001$ ), participants from Accra reported higher intakes of chocolate beverages and soft drinks. Reported intake of alcoholic drinks although not common was significantly higher in London compared to Accra. Participants who drank alcoholic drinks about three to four times a week were about 19% and 13% from London and Accra respectively, with beer and wine being the main types consumed (Figure 3).

The type of fat and oils consumed between the two locations showed remarkable differences between groups (Figure 4). Vegetable oils were commonly used in both locations but the proportion of participants who used palm oil more than five times a week was significantly lower in London than Accra (15% vs. 51%,  $P=0.001$ ). Furthermore, while London participants rarely used coconut oil in cooking, 24% of Accra participants sometimes used it for cooking. The proportion of participants who reported the use of polyunsaturated margarine and butter as spreads at least three times a week was significantly higher in London compared to Accra (33% vs. 18%,  $P<0.05$ ). Fruits most often consumed in London were apples and citrus fruits (oranges) followed by melons while in Accra the most frequently consumed fruit were citrus fruits followed by banana (Figure 5). Non-traditional vegetables such as peas, cucumber, sweet pepper, cauliflower, and lettuce were consumed by a higher proportion of participants from London than Accra. The majority of Accra participants opted for traditional vegetables (e.g. okra, garden eggs, and "nkontomire") which were mainly consumed in the form of stews or soups. With the exception of "Ghanaian stew" and "light soup" which was commonly consumed by both groups, consumption of all other Ghanaian stews and soups were lower in London compared with Accra (Figure 6).

Reported intakes of chicken and beef were similar in both locations. More than half of participants from each location reported consumption of chicken more than once a week. The frequency of consumption of beef was reported as one to four times a week by 18% of London participants and 27% of Accra participants. Besides this, other types of meat such as goat, bacon, corned beef and turkey were consumed frequently by a higher proportion of participants from London (Figure 7). Frequency of consumption of fish in London was significantly lower than Accra. About a third of participants from London (30%) reported intakes of more than five times a week compared to more than half (68%) of Accra participants (Figure 8). Low consumption of legumes and pulses were observed in both locations. The main type of milk commonly consumed in London and Accra was evaporated milk. However, 43% of participants from London also reported intakes of semi-skimmed milk at least four times a week, which was rare in Accra. Other types of milk and milk products such as soya milk, yogurt and cheese were not commonly consumed in any of the locations (Figure 9).

### DISCUSSION

The purpose of this study was to determine whether there were differences in eating patterns between a first generation migrant Ghanaian population living in London with an urban population in Accra. Comparisons between the two cities showed that while there were some similarities in food consumption, the frequency of consumption of most traditional Ghanaian foods had declined. New foods had been adopted and in a few cases there was substitution with similar foods for favourite dishes. Foods, that showed significantly different frequency of consumption by participants in both locations, were traditional staples, vegetables, and cooking oils. Traditional breakfast meals such as maize and millet porridge appeared to have been replaced with frequent drinking of tea and consumption of breakfast cereals. There was also a decline in consumption of traditional vegetables such as okra, eggplant and cocoyam leaves, which are mainly consumed in the form of stews and soup. Alternatively, non-traditional vegetables such as cucumber, lettuce, mixed vegetables and sweet pepper with substitutions of spinach in the place of "nkontomire" (cocoyam leaves) were eaten more often in London. It was evident from responses by participants from London that prices of traditional vegetables had an effect on vegetable intake (data not shown). This establishes the fact that cost has an effect on choice of food. Preparation of most Ghanaian dishes using these vegetables especially in stews involves the addition of substantial quantities of these vegetables therefore it is likely that participants shifted to relatively cheaper alternatives. The shift towards intake of some of these vegetables was encouraging since some of these are eaten uncooked and would contribute to an improved vitamin C status. Some of the food habits observed in London were similar to patterns observed in Ghanaian migrants by other studies in the West. The increased consumption of meat, lower intakes of fish and substitution of "nkontomire" (cocoyam leaves) with spinach in London participants was observed among migrant Ghanaian populations in Australia and Germany (Saleh *et al.*, 2002; Tuomainen, 1996). Our data indicated that vegetable oils were

widely used in both locations but the use of palm oil was less frequent in London whereas in Accra it was frequent. Similarly, Ghanaian students in Germany (Tuomainen, 1996) were found to have substituted vegetable oils with palm oil. In this present study, the change in cooking oil is most probably related to cost since more than half of London participants responded that the price of palm oil was expensive (data not shown). Other factors such as higher socio-economic status and health awareness may partly explain the change as found in a study in Costa Rica (Colon-Ramos *et al.*, 2007). Considering the educational level, occupational status and proportion of participants who were using supplements in London there are indications that this group was more concerned about health, thus accounting for the selection of vegetable oils over palm oil. Public health campaigns on health benefits associated with the use of unsaturated oils in the UK may also contribute to the low consumption.

Our data showed that some participants in London had adopted new foods and fruits such as breakfast cereals, semi-skimmed milk, wholemeal bread, strawberry, melon, plum and grapes. Additionally, there were significantly higher intakes of fruit juices. These findings ties in with another Australian study that reported that Sub-Saharan African migrants to Australia had adopted similar foods and fruits (Renzaho and Burns, 2006). These choices are healthy and may lead to an improved micronutrient status. The higher intake of fruit juice in London participants is consistent with Tuomainen's finding on Ghanaian students in Germany (Tuomainen, 1996). According to the author, frequent intakes of juice appeared to be a habit adopted in Germany and had replaced the traditional Ghanaian practice of drinking water with meals. Despite these changes, there was evidence that some favourite traditional Ghanaian foods were retained. Nearly half of London participants (41%) reported frequent intakes of "fufu", a favourite dish of Akans who formed the majority in this group. Pounded "fufu" had been substituted with processed forms such as plantain, yam and cocoyam fufu flour. Many participants also reported frequent intakes of "Ghanaian stew" a favourite dish which is most often consumed with rice. Moreover, unlike other traditional stews the main ingredient used in preparation of this stew is tomato, which is not expensive in London. Other foods such as white bread, evaporated milk, rice and malted drinks which are commonly consumed in Ghana still remained dominant in London. Current evidence shows that the use of dietary supplements has increased over recent years in the Western world (Conner *et al.*, 2003). Consistent with these studies, our data showed that the use of supplements was more common in London than Accra with a higher proportion of women than males reporting intakes in both locations. The higher intake of supplements among women is consistent with findings of surveys and studies in Western countries (NDNS, 1990; NHANNES, 2000; Marques-Vidal *et al.*, 2007). The significantly higher intake of supplements by London participants may be due to a change in perception of supplements influenced by migration. For many people in Ghana, supplements are perceived as medications therefore most people use them when it is prescribed by a health personnel or when they have a health problem. Moreover, most of these supplements are sold in pharmacy shops unlike the UK where they are easily found on shelves in supermarkets and

other shopping outlets. With migration it is likely that participants in London may have acquired more knowledge through the media to accept supplements as natural food. Several limitations of this study are worthy of note. The dietary assessment methods used in this study may have a level of underreporting or overreporting. It is also likely that eating habits were modified to impress the researcher and these may affect the results. Furthermore, the method of recruitment may also include some bias since it is likely that those who were willing to participate were people who were concerned about health and so had healthier diets. Future studies including large numbers of participants from another socio-economic group are needed to confirm this finding.

## Conclusion

This paper has provided valuable information on food habits and eating patterns of a Ghanaian migrant population in the UK. These findings suggest that migrants may move to healthier changes that may be protective against chronic disease risk but also develop other unhealthy habits of the host country that may have adverse effect on health.

## Acknowledgements

The authors express their appreciation to participants for their time and willingness to participate in this study.

## Glossary

- Banku:** fermented cornmeal and cassava dough cooked into a ball
- Fufu:** pounded cassava with unripe plantain, yam or cocoyam and made into a ball
- Kenkey:** fermented corn dough made into a ball, wrapped in corn husk and cooked over heat
- Nkontomire:** leaves from the cocoyam plant
- Light soup:** soup prepared with vegetables, meat and fish

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