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Assessing the diet of the British African-Caribbean population: frequency of consumption of foods and food portion sizes

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There is a very high prevalence of diet related disorders in the British African-Caribbean population but very few studies have determined associations between diet and disease within this community. There are virtually no published data on the frequency of foods consumed by this population or on the usual portion sizes which are necessary not only for nutritional epidemiological studies but also for treating diet related conditions such as diabetes. Here we present the frequency of foods consumed, assessed by a quantitative FFQ specifically developed for this sample, and the usual portion size reported by 210 randomly selected adult men and women. Frequency of consumption of foods and food portion sizes reported differed greatly from those consumed by the majority White population. This paper highlights the need to collect valid food consumption data for specific ethnic groups rather than using data available from another population, which is inappropriate. Such data will enable more precise dietary assessment and will futher our understanding of the role of diet in the aetiology and prevention of diet-related diseases.

Introduction

There is a high prevalence rate of diet-related disorders in the British African-Caribbean population (Poulter *et al.*, 1997). In recent local surveys, age-standardised rates of diabetes and hypertension for the African-Caribbean population were 18 and 28%, respectively (Mbanya *et al.*, 1999; Cruickshank *et al.*, 2001). However, investigating diet–disease relationships within this population at present is virtually impossible because of the lack of published literature on the information necessary for analysing dietary data. Reliable information on a population's nutrient intake not only requires robust survey techniques and instruments, but also, to analyse such material, details of the foods consumed. To calculate nutrient intake, dietary data collected by any reporting method, whether recall, food frequency questionnaire (FFQ), diary or weighed intake, requires knowledge of the amount eaten (food portion size) and the composition of that food. Such information is provided in Britain from several sources: food portion size from publications such as the commonly used *Food Portion Sizes* (Crawley, 1988) and food composition values from McCance and Widdowson's British food composition tables (Holland *et al.*, 1991). However despite an African-Caribbean population in

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Britain at the 1991 Census (Office of Population Censuses and Surveys 1993) of over 500,000, probably a considerable underestimate, there is virtually no published data on either food portion size or nutritional composition of traditional African-Caribbean foods that are commonly consumed. Furthermore, treating diet-related conditions requires such data for appropriate nutrition education materials to be developed.

In the present paper, we present data on food frequency patterns and mean food portion sizes of commonly consumed West-Indian dishes to provide data necessary for nutritional research and to improve the validity of dietary data collected in British African-Caribbean communities. Details of energy and macronutrient intakes in this and international comparative population samples have been published previously (Sharma, 1996; Sharma *et al.*, 1996, 1999; Sharma & Cruickshank, 2001).

Methods and subjects

Subjects aged 25–79 years were randomly selected from population registers (which do not include details of ethnicity) held at four general practices in central Manchester and were invited to attend a health screening. This achieved a response rate of 67%. All those within this sample who were of African-Caribbean origin (defined as three out four grandparents from the Caribbean of African descent, but excluding those of direct African descent) were invited to complete an interviewer-administered FFQ. This had been developed within the community from 2-day food diaries and included those foods that contributed to 90% of the intake of energy, carbohydrate, protein and fat, as described (Sharma *et al.*, 1996, 1999). Briefly, the FFQ contained both West Indian and European foods, totalling 108 food and drink items. It assessed portion sizes of all food and drink items consumed using food models, standard food portion sizes (one egg, one slice of bread, etc.) or standard household measures familiar to this community (stainless steel serving spoons, West-Indian soup dishes, etc.). To assess the usual food portion size, respondents were shown a plastic food model and asked to state whether their portion was the same as the model, smaller or larger. If the respondent's portion was smaller or larger they were asked to approximate their portion in relation to that of the model (e.g. half as much or twice as much, etc.). This was carried for every food item listed on the FFQ. The same approach was used for standard household units, such as teaspoons, tablespoons and serving spoons of food. For foods that come in standard units, such as eggs and slices of bread, respondents were asked to state how many of that item they would usually consume at one meal.

Frequency of consumption of all listed foods was assessed by one of the following consumption categories based on the previous 12 months: two or more times per day, almost every day, three to five times per week, one or two times per week, one to three times per month, less than once per month, or never consumed. The FFQ was administered mainly within the respondent's home by trained interviewers, although a few interviews were conducted in the subjects general practice surgery when more convenient to the respondent. Anthropometric measurements were also assessed using standardised procedures on a stadiometer and balance or calibrated electronic scales. Ethical permission was granted by the Central Manchester Health District Ethical Committee.

The data collected by FFQ were analysed for mean daily macronutrient intake using a specially constructed analysis program in SPSS for windows (SPSS Inc., 1993), which contained the nutrient values for foods (calculated from weighed recipes collected in the African-Caribbean community in Manchester, as previously described) (Sharma *et al.*, 1996; Sharma & Cruickshank, 2001) or, where appropriate, from the British food tables (Tan *et al.*, 1985; Holland *et al.*, 1991).

Results

Two hundred and fifty-five subjects completed the FFQ (response, 83%). The mean ages of the men and women were 54 and 49 years, respectively. The majority of subjects had been born in Jamaica (68% men and 55% women); 16% of men and 20% of women were born in the UK. The majority of the 'others' had been born in other Caribbean islands. The mean duration of time spent in the UK was 31 years for men and 29 years for women.

Table 1. Usual frequency of consumption (%), the mean portion size (g), and the number consuming West-Indian (WI) and European foods during the previous 12 months (n = 85 men, n = 125 women)

Food	*Method of assessment*[a]	*Never or < 1 per month*	*1–3 times per month*	*1–2 times per month*	*3–5 times per month*	*6 times per week*	*Mean portion (g) for men*	*Number of men eating food*	*Mean portion (g) for women*	*Number of women eating food*
Rice and peas	HH	10	14	70	6	0	214	77	181	120
Rice, plain	HH	10	11	62	16	1	187	80	166	117
Sweet potato	M	68	24	12	0	0	200	44	161	76
Yam	M	45	20	31	3	1	212	57	155	93
Plantain	M	46	27	23	2	1	148	61	112	100
Green banana	M	31	23	37	8	1	169	66	156	103
Cassava	M	95	3	1	0	0	166	12	144	17
Breadfruit	M	73	19	8	0	0	158	41	160	70
Pumpkin	M	67	14	17	2	0	152	37	142	78
Cho Cho	M	81	6	11	0	0	229	18	156	36
Callaloo	HH	69	20	8	2	1	187	52	158	71
Avocado pear	NU	70	18	11	1	1	62	47	49	90
Cabbage	HH	17	20	40	19	4	74	77	69	119
Peas, green	HH	43	20	29	6	2	66	65	57	95
Sweet corn	HH	21	30	39	9		99	74	78	118
Green beans	HH	52	21	22	3	1	77	54	72	84
Cauliflower/broccoli	HH	33	22	38	4	2	180	61	145	107
Potatoes, boiled	M	17	16	48	18	1	338	79	260	114
Chips	M	49	24	24	3	0	264	57	236	89
Coleslaw	HH	53	20	20	6	1	86	39	79	94
Apple	NU	18	11	21	31	20	104	76	107	115
Pear	NU	32	21	24	17	6	93	67	88	106
Banana	NU	16	15	26	27	16	100	76	100	113
Orange	NU	18	13	29	21	19	184	78	173	115
Mango	NU	43	17	24	8	7	184	63	174	108
Tinned fruit	HH	63	21	14	2	0	213	50	148	79
Saltfish fritters	M	80	14	6	0	0	66	44	69	69
Ackee and saltfish	HH	78	18	4	0	0	194	46	159	74
Tinned fish	CAN	45	31	21	2	0	121	53	98	92
Fish boiled, baked, fried	M	15	20	56	8	1	178	78	156	119
Homemade soup	HH	20	22	56	2	0	593	78	491	107
Oxtail stew/soup	HH	76	18	5	0	0	429	38	390	52
Curry meat	HH	44	26	25	4	0	206	62	174	92
Mince dishes	HH	76	15	8	0	0	196	23	154	51
Pattie	NU	75	18	6	1	0	206	41	165	66
Meat pie, pasty	NU	77	13	9	1	1	181	34	157	44

Table 1. (Continued)

Food	Method of assessment[a]	Never or < 1 per month	1–3 times per month	1–2 times per month	3–5 times per month	6 times per week	Mean portion (g) for men	Number of men eating food	Mean portion (g) for women	Number of women eating food
Burgers	NU	83	13	2	1	0	88	20	62	43
Sausages	NU	71	18	10	1	0	127	37	104	63
Bacon	NU	50	19	29	1	1	48	54	44	87
Corned beef	CAN	61	26	12	1	0	65	44	59	83
Meat, roast, chops, steak	M	32	25	40	2	1	106	71	80	95
Chicken, fried, roast, curry	NU	6	7	60	24	3	124	78	103	120
Fried dumpling	NU	46	30	22	1	1	198	64	184	96
White bread	NU	35	13	22	13	17	70	68	54	98
WI bread, hard dough	NU	55	17	19	5	3	103	59	79	92
Brown wholemeal bread	NU	19	9	18	25	30	80	71	68	117
WI sweet bun	NU	75	20	3	2	1	114	52	100	87
Porridge, oatmeal, cornmeal	HH	66	22	21	9	2	236	68	204	99
Weetabix, Shredded wheat	NU	71	8	12	8	1	45	34	33	54
Pizza	M	81	11	8	0	0	171	22	156	56
Pasta	HH	60	16	21	2	0	152	37	144	79
Butter	NU*	84	3	4	4	4	17	16	20	21
Margarine, non-polyunsaturated	NU*	90	1	2	2	5	25	11	15	10
Margarine, polyunsatureated	NU*	62	3	5	11	19	16	24	14	58
Margarine, low fat	NU*	69	2	6	6	17	19	22	16	44
Nuts	NU	38	26	28	6	2	65	73	51	109
Crisps	NU	52	23	18	5	1	27	52	29	91
Sweets	NU	40	18	21	8	14	24	60	23	95
Chocolate	NU	60	18	16	4	1	51	53	55	81
Fruit punch	HH	71	13	14	1	1	216	36	214	59
Fruit juice	HH	21	12	25	22	20	154	67	142	110
Nutriment/nourishment	CAN	77	11	11	1	0	255	4 7	255	38
Regular, fizzy drinks	HH	61	7	17	9	6	343	47	343	54
Diet drinks	HH	58	7	18	8	10	389	34	340	71
Beer, lager, cider	HH	62	18	16	3	1	1010	60	408	43
Stout, Guinness	HH	63	13	16	6	1	585	41	362	54
Spirits	HH	70	15	13	1	1	44	68	38	77
Wine	HH	56	17	21	5	1	189	50	175	79

[a] M, Food model was shown; HH, household unit such as spoon, glass, bowl was shown to the respondent; NU, natural units refers to foods that are usually presented in a standard size such as slice of bread, a burger, a sausage, bar of chocolate, packet of crisps, etc. Wrappers from each item were shown to the respondent; CAN; a can or tin was shown to the respondent.

*For butter and margarine, quantities were quantified using a standard portion patty available commercially.

Fifty-two percent of men were married compared with 39% of women. The mean body mass indices were 27.0 (range, 18.8–36.3) for men and 28.7 (range, 18.2–46.6) for women.

Nutritional intake details have been presented elsewhere (Sharma *et al.*, 1999). Briefly, the mean total daily *energy* intake for the men was 2334 *calories*, and that for the women was 1926 *calories*. The percentages of energy provided by carbohydrate, fat and alcohol for men and women, respectively, were 50.7 and 51.9% for carbohydrate, 31.7 and 32.3% for fat, and 2.2 and 1% for alcohol.

In the present paper, we present data on the first 210 participants that formed part of a Ph.D. thesis (Sharma, 1996). Table 1 presents the frequency of food consumption, the gender-specific mean portion size of food and drink items, and the number of men and women consuming those foods. The diet of the population was mixed with West-Indian foods consumed frequently, although typical British foods were also being eaten. As would be expected, the portion size for almost all items is greater in the men compared with the women.

Discussion

The food patterns and usual food portion sizes of commonly eaten foods by the British African-Caribbean population have been presented. Such data necessary to investigate diet–disease relationships or to assess dietary intake in this population were previously unavailable. To avoid underestimating food intake and to ensure valid dietary intake results, the dietary assessment methodology within this community may need to consider the intake of local as well as traditional foods.

FFQs are often the method of choice for assessing food and nutrient intake in population-based studies because they are cheap, fast, require no literacy skills if they are interview administered, and because of the low subject burden they achieve good cooperation. Many FFQs are semi-quantitative as the portion size of the population has already been established (e.g. the Block FFQ (Block & Subar, 1992), the EPIC FFQ (Riboli, 1992)), or non-quantitative as little extra information is obtained from knowing a precise portion when an average portion size is already known (Tjonneland *et al.*, 1992). Such convenient questionnaires were not previously available for British African-Caribbeans because the usual diet, as well as standard portion sizes, have been unknown. The collection of portion size data using food models (Borrud *et al.*, 1989) for specific ethnic groups has been recommended (Buzzard & Sievert, 1994) because using standard portion sizes from another group can lead to invalid estimates. For example, the average portion size of boiled potatoes for African-Caribbean men and women is 338 g and 260 g, respectively, compared with 180 g for the white population (gender-specific data not given) (Crawley, 1988). A similar pattern is seen for chips (deep-fried potato slices), with the portion size being 264 g for men and 236 g for women in our African-Caribbean sample compared with 180 g for the white population (Crawley, 1988). The mean portion size for homemade soup (made with starchy vegetables) for men and women in our sample was 593 g and 491 g, respectively, yet the medium portion size given for soup for the white population is less than half, at 220 g. These examples illustrate the necessity of collecting ethnic group-specific portion sizes and provides evidence on how far the diet of this community differs from that of the majority white population. Clearly, valid portion size data are not only relevant for assessing the diet of this population, but this knowledge may also be extremely useful in treating diet-related diseases such as diabetes, and (currently beneficial) nutritional patterns in relation to risk of coronary heart disease (Sharma *et al.*, 1998, 1999).

Many FFQs have a standard portion size, or a choice of small, medium or large, often with the aid of food photographs for quantification. However, for the British African-Caribbean population, no information was available of portion sizes consumed for any food item. This method-development study has provided mean portion sizes for this population that can now be used by other researchers as a platform on which to build more refined FFQ. For example, a more refined FFQ might include food photographs based on the mean portion size data presented in the current paper. Such a questionnaire would not require an interviewer, could be sent by mail and would therefore be more useful for epidemiological studies within this population.

Knowledge of the frequency of consumption and of the amount consumed will help guide dietitians and nutrition educators. For example,

although burgers are considered a high-fat food and often targeted in nutrition education messages, the majority of the African-Caribbean population sample (83%) reported consuming this food less than once per month. However, fried, roast and curried chicken were reportedly consumed much more frequently (60% having this at least twice per month and 24% reporting weekly consumption), and targeting these food items may be a much more appropriate. Nutrition educators may also need to consider the amount of food consumed when making dietary recommendations. For example, the mean portion size of homemade West-Indian soup for men in this sample was 593 g and, although this is not considered a high-fat food with only 4.2 g of fat 100 g, when such a large quantity is consumed a single portion would provide 25 g fat.

In conclusion, we have provided for the first time the frequency of consumption of West-Indian and European foods by a British African-Caribbean community, and have shown that dietary assessment surveys must include both traditional and locally available foods. We have also provided average food portion sizes for men and women that are essential for calculating nutrient intakes within this population and are likely to be useful for those health professionals treating diet-related disorders such as diabetes. Using portion sizes based on the diet of the majority white population is inappropriate. Such data will enable more precise dietary assessment and will further our understanding of the role of diet in the aetiology and prevention of diabetes and hypertension, highly prevalent in the British African-Caribbean population.

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