CONSUMPTION PATTERNS OF STREET FOOD CONSUMERS IN CAPE TOWN

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ABSTRACT

Street foods (SF) contribute significantly to the diet of people living in low- and middle-income countries, however there is a paucity of data on consumption patterns of SF. Since many South Africans consume SF regularly, it is important to determine their purchasing habits, food choices, and nutrition knowledge. A cross-sectional survey conducted in Cape Town metropolitan area, with trained fieldworkers using a structured questionnaire on 1121 SF consumers. The first ten clients who visited a randomly-sampled SF vendor were approached and invited to participate. Data were analysed using IBM Statistics SPSS version 23. Most consumers were black, male, single, and had some high-school education and/or matriculated. Main findings indicated that 38% of these consumers consumed SF almost daily, 43.3% consumed SF frequently (2-3 times per week) and 29% spent between R600 and R899 per month on SF. Items purchased most often in descending order of frequency were fruit, foods and baked products, cold drinks, sweets, peanuts, crisps, fruit juice, biscuits, and chocolates. If healthier SF were available, 96% consumers indicated they would purchase these, with fruit, meat/chicken and vegetable stew, yoghurt and nuts being preferred options. There is a large market for SF consumers in Cape Town. However, most food items consumed, with the exception of fruit and peanuts, are unhealthy by virtue of their high sugar and fat content. SF consumers are however, willing to purchase healthier foods, should these be available.

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ARTICLE INFO

Article history
Received 7 July 2016
Revision received 29 August 2016

Keywords
street foods, street-food consumers, purchasing habits, nutrition knowledge, intention to purchase

INTRODUCTION

The sight and smell of street foods (SF) are a common phenomenon in low- and middle-income countries, particularly in urban settings. SF are not only appreciated for their unique

flavours, convenience, and affordability, but also contribute to the economy, the perseverance of cultural and social heritage of the society, and the potential for maintaining and improving the nutritional status of people (Arambulo *et al*., 1994; Draper, 1996; Martins & Anelich, 2000; van't Riet, den Hartog, Mgwani *et al*., 2001; von Holy & Makoane, 2006; Rheinlander *et al*., 2008; Rane, 2011 and Steyn *et al*., 2013). SF are defined as ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers, especially in streets and other similar places (Food and Agricultural Organization [FAO], 1989). However, it needs to be noted that SF are not always healthy foods and beverages; they are frequently energy-dense and high in sugar and fat (Steyn *et al.,* 2013).

SF contribute significantly to the diet of numerous people living in low- and middle-income countries, including South Africa (Steyn *et al*., 2013). In South Africa, 11.3% of the population purchase SF on a regular basis (Steyn & Labadarios, 2011). Black South Africans are the most regular buyers of SF, with nearly one out of five persons (19%) consuming these at least twice a week. Furthermore, with an increasingly urban workforce and many people working away from home, SF have become one of the most convenient sources of meals and snacks (Harvard School of Public Health, N.D.). Many people lack proper housing and cooking facilities, hence SF become an ideal choice of cheap and labour-free meals (Dawson & Canet, 1991; Steyn *et al*., 2013).

In the literature, street-food consumers are mostly described as being young, single, unskilled workers, with a low level of education and poor knowledge of hygiene (Faye *et al*., 1998, Martins, 2006, Rheinlander *et al*., 2008). Indeed, in a study conducted by Martins (2006), it was shown that most SF consumers were black (98.9%), single (50%), male (88.4%), and between ages 26 and 35 years. Most of these consumers (64.1%) had some form of high-school education, with fewer people (8%) having post high-school qualifications and university degrees. Worthy of noting, is that a fairly large number of street-food consumers are operational around the taxi and bus stop-off points (40.4%), as vendors are commonly placed at transport interchanges (Monsupye & von Holy, 2000).

While a few microbiological studies having been conducted on SF sold in South Africa (von Holy and Makhoane, 2006; Monsupye & von Holy, 1999; Monsupye & von Holy, 2000; Lues *et al*. 2006; Martins & Anelich, 2000), there is a paucity of data on the nutritional characteristics, particularly with regard to purchasing habits and preferences. Since an earlier study indicated that many street-food items sold are unhealthy (Steyn & Labadarios, 2011), which is contrary to the findings of other studies presented earlier; it was deemed important to investigate consumer preferences and healthy options consumers would be willing to purchase. This paper aims to examine the consumption patterns of street food consumers in Cape Town.

METHODS AND PROCEDURES

Ethical approval

This research received ethical approval from the University of the Western Cape's Ethics Committee (Research Project: Street food: The development of a street food vending model which offers healthy foods for sale Registration no: 14/4/17). Ethical approval for an earlier and larger study to intervene with street-food vendors and consumers was previously obtained from the Human Sciences Research Council (Protocol No REC13/20/02/13). In addition, permission to intervene with street-food vendors was obtained from the City of Cape Town (ID No. 10341). Informed consent was obtained from all participants.

METHODS

Study design

A cross-sectional survey was undertaken in Cape Town metropolitan area in 2013.

Sample

On the basis of the 2011 Census, the urban population in the Western Cape was 4,088,709. The minimum sample size to represent this population is 785, based on the 95% level of significance, 80% power, 50% defects (which gives the maximum sample size) and 0.05 margin of error (http://www.wessa.net/rwasp_sample.wasp). Accounting for a 25% non-response, the final sample required was 1,047. Consumers were selected from the sites where the vendors were drawn. These vendors (N=831) had been randomly selected in an earlier study (Hill, 2016). The first ten clients who visited the vendor, who was included in a random sample, were approached and requested to participate. If anyone refused to

participate the next client was selected. The final sample comprised 1121 consumers.

Data collection methods

Trained fieldworkers under the supervision of a trained fieldwork coordinator and the primary researcher conducted interviews with consumers using a structured questionnaire developed for the purpose of the study. The questionnaire included questions on socio-demographic factors; purchasing habits; consumption preferences; and nutrition knowledge using a questionnaire validated by two M Tech Consumer Sciences students.

Data analysis

Data entering was done by two trained data capturers and was checked by the primary investigator to ensure quality control. Data were entered into Microsoft Access 2010. For quality assurance, data entry was double-checked by the primary investigator and corrected accordingly. The data were then exported to Microsoft Excel 2010 by the primary investigator and cleaned to prepare for analysis. While in Microsoft Excel 2010, some data (responses) were recoded, and or collapsed for more meaningful analysis to develop new Excel worksheets. For example, the amount of money spent which was an open-ended question was grouped and recoded into categories as can be seen in the results below. The time of purchase categories were collapsed from four categories down to two. These worksheets were then imported to IBM Statistics SPSS version 23.

As a first level of analysis, univariate analysis or frequencies were run on all variables in the questionnaire. For descriptive purposes, frequencies were tallied and percentages calculated. At a second level of analysis, cross tabulations using the Chi-square test and Pearson correlations were conducted to establish whether relationships existed or whether certain independent variables influenced dependent variables. An arbitrary cut off point for the p value was set at $p < 0.05$.

Fifteen nutrition-related questions were included in the consumer survey questionnaire having a total score of 15 points (Table 7). Scores were then grouped together in tertiles, i.e. 0-5 out of 15 indicating a low or poor score, 6-10 an average score, and 11-15 indicating an acceptable or good nutrition knowledge score.

RESULTS

Socio-demographic results

Overall, a total of 1121 consumers were interviewed in 31 areas around the central business district areas in major cities, town centres as well as transport interchange areas in the townships and informal settlement areas (Table 1). There were more male (55.6%) than female (44.2%) consumers in the sample. Most consumers were South African (94.7%), with black South African consumers (77.0%) outweighing others by far, followed by Coloureds (17.3%), non-South African consumers (5.1%), whites (0.4%), and only one (0.8%) of Indian descent. Most consumers (93.5%) were between the ages of 18 and 54 years, mostly single (59.7%) or married (31.2%), and had matriculated (matric) (40.7%) or less than matric (45.5%). Only 13% of consumers had a post-matric education, and 0.5% had no formal education. Fifty-one per cent were employed full-time, while 11.4% were employed part-time, 24.6% were unemployed, 7.3% were students, and 5.2% were self-employed.

Slightly over half of consumers (50.6%) earned less than R3 000 a month. Nineteen per cent earned between R3 000 and R4 000, 14.5% earned between R4 000 and R6 000, and 15.3% earned more than R6 000 per month. Most consumers used public transport, i.e. travelled either by train (39%) or taxi (37.7%) or by bus (7.4%), while a few 8.6% used their own transport. Some consumers (6.9%) either walked or cycled to work (coded as “other” in Table 1).

Purchasing habits

Most consumers (43%) bought SF two to three times per week, while a significant number (38.3%) bought SF almost every day, (see Table 2). Nineteen per cent bought SF about once a week or once or twice a month (numbers combined in Table 2). In terms of percentage more non-South Africans purchased SF daily than South Africans did (42.4% vs. 38%, $p < 0.05$).

Forty-six per cent of the consumers purchased SF near work, while 30.3% purchased these near their homes, 5.9% near their schooling areas (colleges), and 20% purchased all over (Table 2). There were statistically significant differences found (Chi-square test, $p < 0.0001$) between vicinity of purchases and age, with

TABLE 1: SOCIO-DEMOGRAPHIC PROFILE OF STREET-FOOD CONSUMERS (N=1121) IN CAPE TOWN IN 2013

Sex N (%)	*Males*	*Females*						
	623 (55.6)	495 (44.2)						
Age group (years) N (%)	*13 – 17*	*18 – 24*	*25 – 34*	*35 – 44*	*45 – 54*	*55 – 64*	*≥65*	
	23 (2.1)	217 (19.4)	420 (37.5)	289 (25.8)	122 (10.9)	36 (3.2)	13 (1.2)	
Nationality N (%)	*South African*	*Other*						
	1062 (94.7)	59 (5.3)						
Race N (%)	*Black African*	*Coloured*	*Indian/Asian*	*White*	*Other/non-South Africans*			
	863 (77)	194 (17.3)	1 (0.1)	5 (0.4)	57 (5.1)			
Marital status N (%)	*Single*	*Married*	*Living with partner*	*Separated*	*Divorced*	*Widowed*		
	669 (59.7)	350 (31.2)	45 (4)	19 (1.7)	16 (1.4)	22 (2)		
Highest level of education N (%)	*Primary school*	*Some high school*	*Matric*	*Diploma*	*Degree*	*No schooling*		
	86 (7.7)	424 (37.8)	456 (40.7)	113 (10.1)	32 (2.9)	6 (0.5)		
Employment status N (%)	*Unemployed*	*Full-time employed*	*Part-time employed*	*Scholar/ student / training*	*Self-employed*			
	276 (24.6)	576 (51.4)	128 (11.4)	82 (7.3)	58 (5.2)			
Income bracket N (%)	*<R3 000*	*R3 000 – R4 000*	*R4 000 – R6 000*	*>R6 000*	*Other*			
	567 (50.6)	208(18.6)	162 (14.5)	171 (15.3)	13 (1.2)			
Main mode of transport N (%)	*Train*	*Bus*	*Taxi*	*Car*	*Other*			
	437 (39)	83 (7.4)	423 (37.7)	96 (8.6)	77 (6.9)			
Location N (%)	*CPT Upper Deck and Station*	*CPT CBD Area*	*Gugulethu*	*Mfuleni*	*Bellville*	*Wynberg*	*Nyanga terminus*	*Other*
	37 (3.4)	167 (15.5)	122 (11.3)	71 (6.6)	260 (24.1)	52 (4.8)	55 (5.1)	357 (31.8)

older people (>55 years, up to 62%) purchasing close to home and more younger people (25-54 years, up to 52%) purchasing close to work. Similar significant differences were found between vicinity of purchases and marital status (with over 55% of people who are married, living with a partner purchasing close to work, as opposed to those who are widowed (50%) who purchase close to home). Statistically significant differences were also true for vicinity of purchases and level of education (most people (up to 63%) with some high school education and above who purchase close to work as opposed to those with some primary school or no-schooling (up to 100%) who purchase close to home).

The purchasing of SF seemed to be spread throughout the day; with 30.6% of consumers reporting that they purchased SF between 12 pm and 3 pm, 25.8% between 10 am and 12 pm, 14.4% before 10 am, 7.5% between 3 pm and 6 pm, 1.8% after 6 pm, and 19.7% consumers at various times throughout the day (Table 2). Statistically significant differences were found between time of purchase of SF and age ($p < 0.0001$), time of purchase of SF and marital status ($p < 0.0001$) and time of purchase of SF and level of education ($p < 0.05$).

ISSN 0378-5254 Journal of Family Ecology and Consumer Sciences, Special Edition
Food and nutrition challenges in Southern Africa, Vol 1, 2016

TABLE 2: PURCHASING HABITS OF STREET-FOOD CONSUMERS

Socio-demography	Purchasing habits															
	Total	Frequency of purchases			Money spent on purchases per month					Vicinity of purchases			Time of purchases			
		Almost every day	2-3 times p/w	Once a week/ month	<R300	R300 - R599	R600 - R899	R900 - R1200	>R1200	Near home	Near work	Near school/ college	am - 12 pm	12 - 6 pm	Any time of day	
	N	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Nationality																
South African	1062	404 (38)[1]	460 (43.3)[1]	197 (18.5)[1]	292 (27.5)	228 (21.5)	308 (29)	184 (17.3)	29 (2.7)	320 (30.1)	497 (46.8)	65 (6.1)	432 (40.7)	419 (39.4)	208 (19.6)	
Non-South African	59	25 (42.4)[1]	22 (37.3)[1]	11 (18.7)[1]	19 (32.2)	11 (18.6)	16 (27.1)	6 (10.2)	4 (6.8)	20 (33.9)	23 (39)	1 (1.7)	18 (30.5)	28 (47.5)	13 (22)	
Race																
Black	863	312 (36.2)	393 (45.5)	157 (18.2)	216 (25)	183 (21.2)	260 (30.1)	164 (19)	24 (2.8)	277 (32.1)[3]	386 (44.7)[3]	58 (6.7)[3]	357 (41.3)	325 (37.7)	178 (20.6)	
Coloured	194	88 (45.4)	68 (35.1)	38 (19.5)	74 (38.1)	44 (22.7)	48 (24.7)	18 (9.3)	5 (2.6)	42 (21.6)[3]	108 (55.7)[3]	6 (3.1)[3]	73 (37.7)	92 (47.4)	29 (14.9)	
Indian/Asian	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)[3]	1 (100)[3]	0 (0)[3]	1 (100)	0 (0)	0 (0)	
White	5	4 (80)	0 (0)	1 (20)	1 (20)	1 (20)	1 (20)	2 (40)	0 (0)	1 (20)[3]	2 (40)[3]	2 (40)[3]	2 (40)	2 (40)	1 (20)	
Foreign	57	25 (43.9)	20 (35.1)	11 (19.3)	19 (33.3)	11 (19.3)	14 (24.6)	6 (10.5)	4 (7)	19 (33.3)[3]	23 (40.4)[3]	0 (0)[3]	16 (28.1)	28 (49.1)	13 (22.8)	
Gender																
Male	623	245 (39.3)	271 (43.5)	105 (16.9)	156 (25)	136 (21.8)	175 (28.1)	113 (18.1)	24 (3.9)	180 (28.9)	285 (45.7)	30 (4.8)	240 (38.5)	237 (38)	144 (23.1)	
Female	495	183 (37)	209 (42.2)	103 (20.9)	155 (31.3)	102 (20.6)	147 (29.7)	77 (15.6)	9 (1.8)	160 (32.3)	233 (47.1)	36 (7.2)	207 (41.9)	210 (42.4)	77 (15.6)	
Age																
<18 years	23	11 (47.8)	9 (39.1)	3 (13)	9 (39.1)[2]	5 (21.7)[2]	8 (34.8)[2]	0 (0)[2]	1 (4.3)[2]	5 (21.7)[3]	3 (13)[3]	14 (60.8)[3]	6 (26.1)[3]	14 (60.8)[3]	3 (13)[3]	
18 – 24	217	87 (40.1)	90 (41.5)	40 (18.4)	84 (38.7)[2]	40 (18.4)[2]	60 (27.6)[2]	24 (11.1)[2]	5 (2.3)[2]	64 (29.5)[3]	83 (38.2)[3]	37 (17)[3]	91 (42)[3]	80 (36.8)[3]	46 (21.2)[3]	
25 – 34	420	166 (39.5)	183 (43.6)	70 (16.7)	101 (20.1)[2]	96 (22.9)[2]	124 (29.5)[2]	85 (20.2)[2]	6 (1.4)[2]	132 (31.4)[3]	211 (50.2)[3]	13 (3.1)[3]	166 (39.5)[3]	164 (39)[3]	90 (21.4)[3]	
35 – 44	289	115 (39.8)	126 (43.6)	47 (16.3)	58 (20.1)[2]	64 (22.1)[2]	75 (26)[2]	66 (22.8)[2]	17 (5.9)	77 (26.6)[3]	151 (52.2)[3]	2 (0.7)[3]	125 (43.3)[3]	105 (36.3)[3]	58 (20.1)[3]	
45 – 54	122	44 (36.1)	53 (43.4)	25 (20.5)	32 (26.2)[2]	25 (20.5)[2]	46 (37.7)[2]	13 (10.7)[2]	3 (2.5)[2]	39 (32)[3]	60 (49.2)[3]	0 (0)[3]	45 (36.9)[3]	57 (46.8)[3]	19 (15.6)[3]	
55 – 64	36	4 (11.1)	13 (30.6)	19 (52.8)	18 (50)[2]	8 (22.2)[2]	9 (25)[2]	0 (0)[2]	1 (2.8)[2]	15 (41.7)[3]	9 (25)[3]	0 (0)[3]	11 (30.5)[3]	21 (58.3)[3]	4 (11.1)[3]	
≥65 years	13	1 (7.7)	8 (61.5)	4 (30.8)	8 (61.5)[2]	1 (7.7)[2]	2 (15.4)[2]	2 (15.2)[2]	0 (0)[2]	8 (61.5)[3]	3 (23.1)[3]	0 (0)[3]	6 (46.2)[3]	6 (46.2)[3]	1 (7.7)[3]	
Marital status																
Single	669	258 (38.6)	301 (45)	110 (16.5)	198 (29.6)	143 (21.4)	188 (28.1)	108 (16.1)	18 (2.7)	218 (32.6)[3]	279 (41.7)[3]	63 (9.4)[3]	256 (38.3)[1]	264 (39.4)[1]	149 (22.3)[1]	
Married	350	134 (38.3)	147 (42)	67 (19.1)	86 (24.6)	73 (20.9)	104 (29.7)	66 (18.9)	13 (3.7)	85 (24.3)[3]	193 (55.1)[3]	2 (0.6)[3]	147 (42)[1]	137 (39.2)[1]	63 (18)[1]	
Living with partner	45	20 (44.4)	15 (33.3)	10 (22.2)	9 (20)	10 (22.2)	17 (37.8)	9 (20)	0 (0)	14 (31.1)[3]	25 (55.6)[3]	0 (0)[3]	20 (44.4)[1]	19 (42.2)[1]	6 (13.3)[1]	
Separated	19	6 (31.6)	5 (26.3)	8 (42.1)	7 (36.8)	4 (21.1)	4 (21.1)	3 (15.8)	0 (0)	8 (42.1)[3]	9 (47.4)[3]	0 (0)[3]	11 (57.9)[1]	7 (36.9)[1]	1 (5.3)[1]	
Divorced	16	5 (31.3)	9 (56.3)	2 (12.6)	1 (6.3)	5 (31.3)	6 (37.5)	3 (18.8)	1 (6.3)	4 (25)[3]	9 (56.3)[3]	0 (0)[3]	7 (43.8)[1]	8 (50)[1]	1 (6.3)[1]	
Widowed	22	6 (27.7)	5 (22.7)	11 (50)	10 (45.5)	4 (18.2)	5 (22.7)	1 (4.5)	1 (4.5)	11 (50)[3]	5 (22.7)[3]	1 (4.5)[3]	9 (40.9)[1]	12 (54.6)[1]	1 (4.5)[1]	
Education																
Primary school	86	25 (29.1)	33 (38.4)	28 (32.5)	41 (47.7)	21 (24.4)	14 (16.3)	6 (7)	1 (1.2)	36 (41.9)[3]	31 (36)[3]	1 (1.2)[3]	30 (34.9)[3]	40 (46.5)[3]	16 (18.6)[3]	
Some high school	424	169 (39.9)	168 (39.6)	86 (20.2)	123 (29)	87 (20.5)	124 (29.2)	71 (16.7)	13 (3.1)	130 (30.7)[3]	206 (48.6)[3]	15 (3.5)[3]	160 (37.8)	160 (37.7)	103 (24.3)	
Matric	456	185 (40.6)	209 (45.8)	61 (13.4)	112 (24.6)	104 (22.8)	134 (29.4)	83 (18.2)	14 (31.1)	142 (31.1)[3]	195 (42.8)[3]	34 (7.4)[3]	191 (41.9)[3]	174 (38.2)[3]	90 (19.7)[3]	
Diploma	113	39 (34.5)	54 (47.8)	20 (17.7)	21 (18.6)	23 (20.4)	39 (34.5)	22 (19.5)	4 (3.5)	19 (16.8)[3]	68 (60.2)[3]	15 (13.3)[3]	49 (43.3)[3]	58 (51.3)[3]	6 (5.3)[3]	
Degree	32	9 (28.1)	14 (43.8)	9 (28.1)	8 (25)	3 (9.4)	12 (37.5)	6 (18.8)	1 (3.1)	5 (15.6)[3]	20 (62.5)[3]	1 (3.1)[3]	13 (40.6)[3]	13 (40.6)[3]	6 (18.8)[3]	
No schooling	6	0 (0)	3 (50)	3 (50)	3 (50)	1 (16.7)	0 (0)	2 (33.3)	0 (0)	6 (100)[3]	0 (0)[3]	0 (0)[3]	5 (83.3)[3]	1 (16.7)[3]	0 (0)[3]	

[1]p < 0.05 [2]p < 0.001 [3]p <0.0001 [Pearson Chi-Square]

TABLE 3: TYPE OF STREET FOOD MOST FREQUENTLY PURCHASED

Foods	N	%
Fruit	977	87.2
Cooked food and baked products	808	72.1
Cold drinks	754	67.3
Sweets	491	43.8
Peanuts	350	31.2
Crisps/chips	322	28.7
Fruit juice	319	28.5
Chocolate	243	21.7
Biscuits	268	23.9
Other	49	4.4

TABLE 4: AMOUNT SPENT BY STREET-FOOD CONSUMERS ON COOKED FOOD AT A TIME

Amount in Rand	N	%
<R10	114	10.2
R10 – R20	279	24.9
R20 – R30	472	42.1
R30 – R40	111	9.9
>R40	11	1

TABLE 5: CONSUMERS' HEALTHY OPTION PREFERENCES

Healthier food option	N	%
Milk or milk drinks	396	35.3
Yoghurt	476	42.5
Yoghurt and muesli	242	21.6
Yoghurt and fruit	369	32.9
Nuts	408	36.4
Fresh fruit juice	402	35.9
Fresh vegetable juice	233	20.8
Salad	232	20.7
Fruit	827	73.8
Fruit salad	226	20.2
Dried fruit	248	22.1
Peanuts and raisins	404	36
Cooked vegetables eg. corn on the cob	370	33
Vegetable skewers	110	9.8
Fruit skewers	87	7.8
Baked potato	166	14.8
Whole wheat sandwich	163	14.3
Meat or chicken cooked with veg (not fried)	533	47.5
Vegetable burgers	98	8.7
High fibre muffins	226	20.2
Pita bread with salad fillings	80	7.1
Wraps with healthy fillings	78	7

Thirty per cent of consumers spent between R600 and R999 (28.9%) per month, 28.0% spent less than R300, and 22.0% spent between R300 and R599 (21.3%) per month on SF (Table 2). More than 20.0% in the age groups 25-44 years spent R900 to R1200 per month on SF, although the vast majority spent between R600 and R899 per month. There were statistically significant differences found in amount of money spent on SF and age ($p < 0.0001$). Older people appeared to have spent less on SF than other consumers.

Consumption preferences

A large number of consumers indicated they purchased fruit (87.2%), cooked food and baked products (72.0%), cold drinks (67.3%), and sweets (43.8%) regularly (see Table 3). On the other hand, peanuts (31.2%), chips/crisps (28.7%), fruit juice (28.5%), biscuits (23.9%), and chocolates (21.7%) were purchased to a lesser extent.

Table 4 shows that the greatest percentage of consumers (42.1%), spent R20 to R30 per time on cooked foods. These cooked food products included whole meals, such as a high-fat meal of meat with visible fat, starch, fat and vegetables, fish and chips. Other items such as "vetkoek" (fat cake/doughnut) with a protein filling of chicken liver or French polony were also popular.

Almost 96.0% (n=1074) of consumers indicated that they would purchase healthier SF if these were available, while only 4.0% did not think

TABLE 6: FREQUENCY OF FRUIT AND VEGETABLE PURCHASES BY STREET-FOOD CONSUMERS

	Fruit		Vegetables	
	N	(%)	N	(%)
Everyday	306	(27.3)	58	(5.2)
2-3 times per week	627	(55.9)	494	(44.1)
2-3 times per month	140	(12.5)	383	(34.2)
Hardly ever	41	(3.7)	183	(16.3)

TABLE 7: NUTRITIONAL KNOWLEDGE SCORES OF STREET-FOOD CONSUMERS

Socio-demography	Total	Nutrition Knowledge Score out of 15		
		0-5 (low)	6-10 (average)	11-15 (acceptable)
Nationality	**N**	**N (%)**	**N (%)**	**N (%)**
South African	1062	236 (22.2%)	690 (64.9%)	136 (12.7%)
Non-South African	59	15 (25.5%)	40 (67.8%)	4 (6.8%)
Race	**N**	**N (%)**	**N (%)**	**N (%)**
Black	863	190 (22%)	560 (64.9%)	113 (13.1%)
Coloured	194	45 (23.2%)	127 (65.5%)	22 (5.1%)
Indian/Asian	1	0 (0%)	1 (100%)	0 (0%)
White	5	2 (40%)	2 (40%)	1 (20%)
Foreign	57	13 (22.9%)	40 (70.3%)	4 (7.1%)
Gender	**N**	**N (%)**	**N (%)**	**N (%)**
Male	623	147 (23.7%)	451 (72.3%)	25 (4%)
Female	495	104 (21%)	360 (72.6%)	31 (6.2%)
Age group (years)	**N**	**N (%)**	**N (%)**	**N (%)**
<18 years	23	7 (30.3%)[1]	16 (69.5%)[1]	0 (0%)1
18-24	217	45 (20.8%)[1]	140 (64.4%)[1]	32 (14.7%)1
25-34	420	99 (23.2%)[1]	265 (63.1%)[1]	56 (13.4%)1
35-44	289	59 (20.4%)[1]	194 (67.1%)[1]	36 (12.5%)1
45-54	122	27 (22.2%)[1]	82 (67.2%)[1]	13 (10.7%)1
55-64	36	11 (30.5%)[1]	22 (61.1%)[1]	3 (8.4%)1
≥65 years	13	2 (15.4%)[1]	11 (84.7%)[1]	0 (0%)1
Education	**N**	**N (%)**	**N (%)**	**N (%)**
Primary school	86	29 (33.8%)[2]	51 (59.3%)[2]	5 (5.8%)2
Some high school	424	109 (25.7%)[2]	270 (63.6%)[2]	45 (10.6%)2
Matric	456	85 (18.7%)[2]	304 (66.7%)[2]	67 (14.7%)2
Diploma	113	20 (17.7%)[2]	81 (71.6%)[2]	12 (10.6%)2
Degree	32	3 (9.4%)[2]	20 (62.4%)[2]	9 (28.1%)2
No schooling	6	2 (33.3%)[2]	3 (50%)[2]	1 (16.7%)2

[1]p <0.05 [2]p <0.0001 [Pearson Chi-Square]

they would do so (n=47) (data not shown). This indicates that there is a willingness to change their purchasing habits.

An array of healthier food-item options that were preferred by consumers are presented in Table 5. Consumers were asked to indicate which items they would select if these were available. The most common preferences were for fruit (73.8%) which were shown to be the most commonly bought item in Table 3. This was followed by a preference for cooked meat or chicken with vegetables (not fried) (47.5%); yoghurt (42.5%) and nuts (36.4%), fresh fruit juice (35.9%) and milk (35.3%).

Almost 56.0% of consumers bought fruit from vendors 2-3 times per week, and 12.5% 2-3 times per month (Table 6). Only 5.2% consumers indicated that they purchased vegetables from vendors every day. Most consumers (44.1%) bought vegetables 2-3 times per week, while 34.2% bought vegetables 2-3 times per month from vendors.

Nutritional knowledge

Most (65.0%) consumers obtained an average score (see Table 7), 22.0% a low score and only 13.0% of consumers obtained an acceptable score indicating—good nutrition knowledge. Statistically significant differences were found between nutrition knowledge and age ($p < 0.05$) indicating that knowledge was best in the youngest age group. The poorest knowledge was found in the groups with the lowest levels of education ($p < 0.0001$).

DISCUSSION

In this study, the consumer population, in many aspects, compared well with the profile of consumers in Gauteng (see Martins, 2006). In the present study, most consumers were black, male, single, and most had either some high-school education or at least matric. The consumer profile in Gauteng was described as mostly black (98.9%), single (50.0%), male (88.4%), and between the ages 26 and 35 years. Most (64.1%) of these consumers had some high-school education, with only 8% having post high-school qualifications and a university degree (Martins, 2006). In the present study, there was a much greater age range, with most consumers between the ages 18 and 44 years (83.0%). Similarly, literature suggests that street-food consumers are mostly young, single, unskilled workers, with a low level of education (Faye *et al*., 1998; Rheinlander *et al*., 2008).

In a recent national study of street-food consumers, Steyn & Labadarios, (2011), showed that black Africans are the most regular buyers of SF, with nearly one out of five (19%) consuming SF at least twice a week. In the present study, it also transpired that most consumers purchased SF almost every day or two to three times per week.

In the present study, most consumers made use of public transport, a large number purchased SF near their work place and most consumers earned less than R3000 a month. This confirms the findings in the literature, which states that for people who have to work long hours, travel extensive distances, and have very little income, SF are an inexpensive alternative when everyday pressures, i.e. time, food prices, fuel, cooking equipment, and transport, are taken into consideration (Barth, 1983 & Allain, 1988 in Wilnarno & Allain, N.D.; Steyn *et al*., 2013). Street-food vendors are generally conveniently situated, either in living areas, near the workplaces or near transport depots where they provide a source of relatively inexpensive and convenient food (Lues *et al*., 2006).

Even though most consumers earned less than R3 000 per month (in 2013/14 when study was undertaken), over half of them spent between R300 and R999 on SF per month, which is a significant amount of money (approximately a third of their income). These results support the findings of earlier studies, indicating that in low- and middle-income-countries, households which fall into the lower-income category spend up to 50–70% of household earnings on SF (Dawson & Canet, 1991). This also applies to school-going children in lower-income groups, who may be given money to buy breakfast and/or lunch instead of a packed lunchbox (Ag Bendech *et al*.; 2000, Nago *et al*., 2010; Mwangi *et al*., 2001). Thus, SF have the potential to contribute significantly to the diet of adults and schoolchildren (Steyn *et al*., 2013). Monetary needs also lead many women to swap traditional time spent in the kitchen (preparing food) on income-generating activities (Cohen, N.D.).

Eating meals and snacks outside the home, predominantly in urban areas, seems to be a growing part of the urban lifestyle (Cohen, N.D.). Bhowmik (2005) also noted that the fact that prices of SF are low, enables the urban poor to benefit from these. Furthermore, consumers of

SF hail from various socio-economic classes and benefit from cheap, culturally appropriate, often nutritious meals (Wilnarno & Allain, N.D.; Steyn *et al*., 2013).

Chakravarty and Canet (1996) suggested that SF could possibly be the most affordable method of finding a nutritionally well-balanced meal time option outside the home environment. Bhowmik (2005) also noted that the fact that prices of SF are low, which enables the urban poor to benefit from these. Furthermore, consumers of SF hail from various socio-economic classes, and benefit from cheap, culturally appropriate, often nutritious meals (Wilnarno & Allain, N.D.; Steyn *et al*., 2013). However, they add that the consumers should be educated and capable of choosing a healthy meal. Unfortunately, in the present study, most consumers only had an average or low score regarding nutrition knowledge. This may limit their sense of choice with regard to healthy selections. A number of studies have found an association between poor nutrition knowledge and poor food habits (Worsely, 2002; Wenhold *et al*., 2008). While it was heartening to note that fruit was the most common item purchased by consumers of SF, many purchased cold drinks, sweets, chocolates, and biscuits, regularly. The latter are energy-dense, low in fibre and micronutrients and have high sources of sugar. The dangers of regular consumption of sugar-sweetened beverages have been much extolled in the literature, and has been associated with obesity, type 2 diabetes, hypertension and cardiovascular diseases (Dyson, 2015). Additionally, many selected cooked foods, such as doughnuts and fat cakes, which are fried, are very high in fat making them high in calories and low in micronutrients. Very often the frying oil is reused over a long period and may be regarded as having carcinogenic properties (Stott-Miller, 2013). Furthermore, the association of a high fat intake with obesity and heart disease is well known and may contribute to the burden of obesity and non-communicable diseases in South Africa which is on the rise (Mayosi *et al*., 2009). Data from the 2003 South African Demographic and Health Survey and South African National Health and Nutrition Examination Survey (SANHANES-1) conducted in 2012 indicates that in a period of nine years, obesity prevalence has increased from 8.8% to 10.6% in men and from 27.4% to 39.2% in women (Department of Health MRC, 2007; Shisana et al., 2014).

Most consumers indicated that they would purchase healthier SF if these were available. Unfortunately, the majority of these choices, such as fresh fruit juice, yoghurt and milk drinks, require refrigeration which is not available to many vendors, particularly those who only have a table and perhaps a gas cooker (Hill, 2016). The other healthy option of selecting a cooked meal with vegetables, which is not fried, would be a healthy nutritious option provided that microbiological safety was assured.

CONCLUSION AND RECOMMENDATIONS

Various studies have indicated that SF have the potential to provide consumers with excellent value and may contribute significantly to their nutritional status, provided these are easily accessible; affordable; microbiologically safe; and have an acceptable nutritional value, i.e. being low in sugar and fat and high in fibre and micronutrients (Winarno & Allain, N.D., Cohen, N.D.; FAO, 2012; Steyn *et al*., 2013). From the food preferences indicated by consumers, it appears that they would purchase healthier foods if these were available at a reasonable cost; this is indicated by the options they selected as healthier choices which they would purchase if available, including milk drinks, yoghurt, nuts and fruit juices. However, they need to be well-informed about healthy nutritious foods to make appropriate selections (Worsley, 2002). This further implies that street-food vendors also require more knowledge regarding the selling of healthy foods. This can be regarded as a challenge to those employed in health promotion.

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