



Research

Modern and Traditional fast foods consumption in Benghazi, Libya

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Abstract

The study was conducted to compare between Modern and Traditional fast foods in terms of consumption, and to evaluate the calorific value of the most preferred Modern and Traditional fast foods. This study included 400 participants randomly selected from individuals attending fast foods restaurants, parks, and malls from 21 regions in Benghazi city. Questionnaires were used to collect data among the study population; the questionnaires were filled by the investigator. From five different restaurants, ten types of fast foods (sandwiches) were collected; five traditional and five modern fast foods. The results show that the majority of participants were young people especially those under forty years of age, mostly men and the predominant categories were students and employees. Most of participants consume fast foods on a daily basis especially at dinner and lunch, they preferred both modern and traditional fast foods, and more preferable to sandwiches than meals. Modern fast food samples were higher in terms of total caloric content than traditional fast food samples, which mainly came from its higher fat content and serving size. This study indicated that fast foods consumption were a growing phenomenon among consumers in Benghazi city and revealed that fast food is a concentrated source of energy which simply means "an empty caloric food".

Keywords: Fast foods, Macronutrients, Calorific value, Consumption, Benghazi, Libya

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Introduction

Food consumption is a daily act that accompanies us throughout our lives. Each day, the market is invaded by a multitude of products and offers different services which, apart from their indispensability in our lives, fascinate and attract us, and we are often tempted to buy and test them [7]. As a general term fast foods may be defined as "limited foods menu that lend themselves to production-line techniques; suppliers tend to specialize in products such as hamburgers, pizzas, fried chicken, or sandwiches" [1]. One neglected issue is the consumer's perception of the definition of fast food, as many consumers view fast food to comprise only Western-style products, despite that, many local foods could be considered to be fast food also [11]. Traditional foods are foods and dishes that are passed through generations or which have been consumed for many generations. Traditional foods and dishes are traditional in nature, and may have a historic precedent in a national dish, regional cuisine or local cuisine [9, 14]. Fast foods comprise a growing portion of foods eaten outside the home especially among urban populations both in developing and developed countries. The consumption of Western fast foods like in the developing countries has been increasingly gaining popularity [2, 3]. The prevalence of increasing fast food consumption is seen in the developed and developing countries where fast food has become an inseparable part of regular diet [15].

However, in Libya information regarding Modern and Traditional fast foods consumption is scarce, especially in

Benghazi which is the second largest city in Libya. Therefore, this study was conducted to compare between Modern and Traditional fast foods in terms of consumption in addition, to evaluate the calorific value of the consumer's most preferred fast foods.

Subjects and Methods

Subject: A sample of 400 participants was randomly selected from individuals attending fast foods restaurants, parks, and malls in Benghazi city. The sample was collected randomly from 186 restaurants, according to the administrative division of the regions in the city which were divided into 21 regions.

Methods

Questionnaire: Data was collected by using questionnaires that were designed for matching the study needs among the study population; the questionnaires were filled by the investigator. The questionnaire included data regarding Socio-demographic factors such as (age, sex, marital status, occupation, etc.). Fast foods consumption data such as (number of intake, time, type of fast foods consumed, etc.).

The questionnaire was based on the questions of previous studies with some modifications. [4, 15].

Analysis By-weight of fast food samples:

From five different restaurants, a total of 50 fast food samples (sandwiches) were collected, 10 types of the most commonly consumed fast foods; 5 traditional fast foods and 5 modern fast foods. A description of fast food samples ingredients shown in Table (8).

Firstly, each ingredient of the samples was weighted alone, and then the total weight of each sample as whole was obtained. The samples were weighted using Monobloc top laboratory balance.

Macronutrients of the samples (carbohydrate, fat, and protein) were calculated using food composition tables. To obtain the total caloric content, each component is multiplied by corresponding calorific value.

Results and Discussion

As shown in Table (1) most of participants about two-third were aged from twenty years old to forty years old with (68%) of the total participants, this age group constituted (35.8%) of the total population in Benghazi city according to the population survey (2012). This finding indicates that individuals who consumed fast foods in Benghazi city are mostly young, a typical example of the modern consumer who is open to new lifestyles and to the modern consumer culture. This result was close to the result of a study done in two cities in Morocco (Casablanca and Rabat) shows that the dominant age group amongst the consumers of fast foods is the one between fifteen years old and thirty five years old (64.1%), while over thirty five years old and less than fifteen years old were (35.9%) [7].

The majority of participants in the present study were male with (83.5%) and single (76.5%). These results indicated that the consumption was higher among men than women and for singles more than any other marital status. Our study results were in contrast with the finding of a study by random digit-dial telephone surveys done in Minnesota; USA, which revealed that the majority of participants were women (65.1%) while men consist (34.9%), and regarding the marital status in contrast to our study married were (70%), while Divorced/widowed/separated (14.3%), and Single (15.7%) [5]. The disagreement between these studies and the finding of the present study could be due to the demographic and cultural differences and also it's noticed that the response rate was higher with females than male in the digit-dial telephone surveys. Statistically these results indicated that the gender and marital status significantly affects fast foods intakes among restaurant consumers in Benghazi city ($P < 0.05$, $r = 0.368$, 0.289 respectively) and the frequency of consumption were higher among men than women and are more for singles

than other marital status.

On other hand, students and employee accounts (87.8%) from the total study sample. These results indicated that the predominant categories regarding fast foods consumption in Benghazi city are students and employees, which can be explained by the characteristics of these two categories whose constraints (studies and continuous work schedule). The present study results were consistent with the result of a similar study which was done at local fast food outlets in Sweden, where the most participants were students (40.8 %), while employed (49.5%) , unemployed (8.7%), and only (1%) were retired [10].

Table (2) shows that, more than two-third of the present study population (68.5%) consumed fast foods three times and more per week, while (17%) consumed fast foods at least once a week, and (14.5%) twice weekly. This result indicated that most participants in the present study consume fast foods on a daily basis, which can be explained by the nature of the vast majority of the study population (87.8%) which was students and employees. This result was quite consistent with a study done in Singapore, which revealed that, approximately (77.3 %) of participants usually ate out for at least one of the three main meals per day, while (22.7%) did not usually eat out for any of the three main eating occasions [12]. The similarity in the finding of this study with the result of the present study could be due to the fact that the majority of participants in both studies were (students and employees).

The most of participants preferred to consume fast foods at the dinner (42%), while for lunch (34%), and the least to breakfast (24%) Table (3) .This result indicated that most of participants in the present study consume fast foods at dinner and lunch time with (76%), which could be due to the demographics of the study sample. This result was agreed with the finding of a similar study done at Mansoura University, Egypt which revealed that lunch and dinner (77 %) were the most common timing of fast food meals consumption, while breakfast (15.1%) and snack between meals were (7.9%) [6].

Table (4) shows that, about two third of participants(63%) preferred to consume both modern and traditional fast foods, while (22%) prefer modern fast foods, and (15%) traditional fast foods only, this result indicated that the vast majority of participants visit both modern and traditional fast food restaurants. This result were agreed with a study done in Morocco, indicated that the majority of respondents (84.5%) prefer branded fast food restaurants and traditional fast food restaurants, while (11.3%) not response and few of respondents (4.2%) reported not having any preference for a type of fast food restaurants over the other [7].

Since the majority of participants, over ninety percent preferred sandwiches over meals in both modern and traditional fast foods Table (5). As shown in Tables (6, 7) the top five types of sandwiches which participants mostly preferred for modern fast foods were Beef Burger, Chicken Shawrma, Banneh, Chicken Burger and kebab, while among traditional fast food Fasolia (White beans), Haraime, Tuna and egg, Mshakal (mixed falafel and potatoes), Mshakal mixed Haraime and foul (filled beans) were the mostly preferred sandwiches. A description of fast food samples, their common names and ingredients are shown in Tables (8).

The by-weight analysis of the top preferred fast food sandwiches are shows in Table (9, 10) in concern to the total samples weight of traditional fast foods, Fasolia (white beans) sandwiches were the heavier by the median weight (141.6±39.29 g), Haraime sandwiches were the lighter by the median weight (95±4.52g). Among modern fast food samples, Beef Burger sandwiches were the heavier by the median weight (252.6±23.34 g) and Chicken Shawarma sandwiches were the lighter by median weight (137.6±4.61 g). These results showed that in terms of serving size modern fast food samples were larger in total sample weight than traditional fast foods. While regarding the macronutrient content Table (11) among the modern fast food sandwiches, Kebab was the highest in the average carbohydrate content (50.2 ± 2.7 g /100 g), while the lowest were Beef burger (32.7 ± 3.6 g /100 g). Beef burgers were the highest in terms of average protein content (27.7 ± 3.1 g /100 g), while Kebab had the lowest protein content (18.6 ± 1.2 g /100 g). The highest average fat content was for Beef burgers (27.1 ± 3.8 g /100 g), while the

lowest was Chicken Shawarma sandwiches (12.4 ± 0.3 g /100 g). Among traditional fast food sandwiches, Mshakal (Falafel and Potatoes) were the highest in the average carbohydrate content (63.4 ± 2.9 g /100 g), while the lowest was Haraime (40 ± 2.3 g /100 g). The highest average protein content was for white beans (14.6 ± 2.9 g /100 g), while Mshakal (Falafel and Potatoes) had the lowest average protein content (10.8 ± 0.9 g /100 g). Finally the highest average fat content (12.2 ± 1.2 g /100 g) was for Mshakal (Falafel and Potatoes), while the lowest (3.3 ± 0.2 g /100 g) for Mshakal (Haraime and Foul) sandwiches. Statistically there was a significant difference ($P < 0.05$) among modern fast food sandwiches also there was a significant difference ($P < 0.05$) among traditional fast food sandwiches in terms of average carbohydrate, protein and fat content per 100g.

The total average contents of carbohydrate, protein and fat for all modern fast food samples per 100g were (36.28%, 21.98% and 21.28%) respectively, while among traditional fast food samples were (48.44%, 12.58% and 5.72%) per 100g. These results indicated that modern fast food samples were higher than traditional fast food samples in terms of average protein and fat content per 100g of food sample. There was a significant statistical difference between modern and traditional fast food samples in terms of average protein and fat content (P value = 0.01 and 0.03 respectively), while there was no significant difference (P value = 0.57) in terms of carbohydrate content .

In addition, the average calories content was the highest in the Beef Burger among modern fast food samples (490.2 ± 56.1 kcal/100 g), while the lowest was for Chicken Shawarma (273.9 ± 10.6 kcal/100 g). Mshakal (Haraime and Foul) sandwiches were the lowest in terms of caloric content (249.6 ± 8.4 kcal/100 g) while Mshakal (Falafel and Potatoes) had the highest caloric content (366.3 ± 25.7 kcal/100 g) among traditional fast food sandwiches. Statistically there was a highly significant difference ($P < 0.05$) among modern fast foods sandwiches and also a highly significant difference ($P < 0.05$) among traditional fast food sandwiches in terms of average caloric content per 100g.

As a Subsequent to the higher content of average protein, fat and in addition to heavier average total samples weight, there was a significant differences ($P < 0.05$) between modern fast food samples and traditional fast food samples in terms of average caloric content per 100g, which indicated that modern fast food samples are higher in total caloric content than traditional fast food samples which mainly comes from its high fat content and larger serving size.

A considerable comparable similar study was done in Nigeria, agreeing with the results of the present study. This study revealed that the crude fat was between 13.38g % (w/w) and 23.47g % (w/w), crude protein from 2.43g to 13.83g % (w/w). Energy content ranged between (279.06 Kcal to 419.77Kcal per 100gram). This study has established that fast foods are concentrated sources of energy, low in fiber, poor sources of essential minerals and high in dietary cholesterol [13]. Another study done in India evaluating fast foods salt, total carbohydrates, total fat and Tran's fat content, had revealed the total carbohydrate content in grams per 100 g of sample was ranged from (14g to 73.3g). Total fat ranged from (7.1g to 37.8g) per 100 g of the sample. Tran's fats (0.1 g to 1.6 g) per100 g of the sample. Salt content was in the range from 0.2 to 4.2 g per 100 g of sample. The results of the study indicate that fast foods contain high levels of sugars, salt and Tran's fats. High levels of Tran's fats are a public health concern due to its association with chronic heart diseases [8]. In Egypt, a study was directed to investigate the chemical composition, microbiological quality and biological evaluation of some fast food meals, had revealed that the contents of protein ranged from 13.61 to 26.31 % (w/w), fat from 33.42 to 43.76 % (w/w), carbohydrate from 25.38 to 42.32 % (w/w), fiber from 4.26 to 7.05 % (w/w). Calories provided from 100g dry samples ranged from 545.65 to 589.77. This study has indicated that fast foods are concentrated sources of energy and low in fiber [2].

Table 1. Demographics of study sample

Age groups	No.	%
< 20 yrs.	114	28.5
21-30 yrs.	201	50.3
31-40 yrs.	71	17.7
> 40 yrs.	14	3.5
Gender	No.	%
Male	334	83.5
Female	66	16.5
Marital Status	No.	%
Single	306	76.5
Married	93	23.3
Widowed	1	0.2
Occupation	No.	%
Students	201	50.3
Employee	150	37.5
Retired	1	0.2
Unemployed	48	12
Total	400	100

Table 2. The weekly frequency of fast foods consumption

Frequency of consumption in week	No.	%
Once	68	17
Twice	58	14.5
Three time	139	34.7
More than four times	135	33.8
Total	400	100

Table 3. Distribution of participants according to the preferred time of fast foods consumption

Preferred Time	No.	%
Breakfast	96	24
Lunch	136	34
Dinner	168	42
Total	400	100

Table 4. Distribution of participants according to the type of fast foods they preferred Modern, Traditional or Both

Fast food types	No.	%
Modern	88	22
Traditional	60	15
Both	252	63
Total	400	100

Table 5. Distribution of participants according to the preferred serving type of fast foods (Sandwiches or Meals)

Fast food types	Serving type				Total	
	Sandwiches		Meals			
	No.	%	No.	%	No.	%
Modern fast foods	368	92	32	8	400	100
Traditional fast foods	372	93	28	7	400	100

Table 6. Distribution of participants according to the preferred Modern fast foods (Sandwiches)

Modern fast foods (Sandwich)	No.	%
Beef Burger	120	30
Chicken Burger	40	10
Banneh	82	20.5
Chicken Shawrma	84	21
Kebab	31	7.8
Sheesh	18	4.5
Tabona	25	6.2
Total	400	100

Table 7. Distribution of participants according to the preferred Traditional fast foods (Sandwiches)

Traditional fast foods (Sandwich)	No.	%
Fasolia (White beans)	53	13.3
Foul (Filled beans)	29	7.3
Haraime	67	16.8
Mshakal (mixed Haraime and Foul)	78	19.5
Glaya	30	7.6
Chiken Liver	33	7.3
Tuna and egg	31	7.8
Mafroom	24	6
Falafel	15	4.4

Mshakal (mixed falafel and potatoes)	40	10
Total	400	100

Table 8. Description of fast food samples ingredients

Fast foods	Description of ingredients
Modern sandwiches	
Burger beef	A flat slice made from ground (minced) beef seasoned with salt, pepper and herbs and added Cheese, Fried egg, Lettuce, Tomato, Catchup and Mayonnaise in a Burger bread.
Burger chicken	A slice of grounded Chicken meat with salt, pepper, and herbs, and added Cheese, Fried egg, Lettuce, Tomato, Catchup and Mayonnaise in a Burger bread.
Shawrma chicken	(Grilled chicken meat) consisting of meat packed into a cylindrical mass and grilled on a vertical rotating spit, with slices of tomato and chopped lettuce, Catchup and Mayonnaise in sandwiches of Bori bread.
Banneh	A slice of deeply fried chicken breast seasoned with salt, pepper, garlic, onion, and covered by egg, flour and mashed bread, added Cheese, Lettuce, Tomato, Catchup, Mayonnaise in a Burger bread.
Kebab	Small pieces of Roast meat beef rubbed with salt, pepper and roasted on skewer, and added Salads (Rocca) in sandwiches of Wheat bread.
Traditional sandwiches	
Fasolia (White beans)	Boiled white beans with Tomato sauce, Onion, Garlic, seasoned with Chili pepper, Black pepper, Salt, Spices, Cumin, Seeder, in sandwiches of Wheat bread.
Haraime	Canned tuna or sardine with Tomato sauce and juice, Onion, Garlic, Seasoned with Chili pepper, Black pepper, Salt, Spices, Cumin, Seeder, and added Lemon juice, in sandwiches of Wheat bread.
Tuna and egg	Canned tuna meat, Fried egg, in sandwiches of Wheat bread.
Mshakal (mixed falafel and potatoes)	Falafel (small deep fried broad beans or chickpeas. Herbs, spices, and onion), with French fries, and slices of tomato and chopped lettuce, in sandwiches of white Shami bread.
Mshakal mixed Haraime and foul (filled beans)	Foul (boiled filled beans with onion, tomato sauce, seasoned with Black pepper, salt, spices, Garlic, and mixed with Haraime as above in sandwiches of Wheat bread.

Table 9. By-weigh analysis of the most preferred traditional fast food samples (sandwiches) (*Mean \pm SD)

Traditional fast foods	Egg (g)	Bread (g)	Salads (Lettuce & Tomatoes) (g)	Haraime (g)	White beans (g)	Foul (filled beans) (g)	Tuna (g)	Fried potatoes (g)	Falafel (g)	Total weight (g)

	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Fasolia (White beans)	/	102.2± 31.08	/	/	39.4 ± 8.67	/	/	/	/	141.6 ± 39.29
Haraime	/	69± 4.35	/	24.4 ± 4.15	/	/	/	/	/	95 ± 4.52
Tuna and egg	12 ± 1.73	76.6 ± 22.87	/	/	/	/	13.8 ± 1.78	/	/	102.4 ± 22.35
Mshakal (mixed falafel and potatoes)	/	50.8 ± 2.16	10±2.54	/	/	/	/	32.3 ± 3.34	37.4 ± 6.58	130.4 ± 9.01
Mshakal (mixed Haraime and Foul)	/	67.8 ± 3.11	/	18 ± 2.23	/	11±5.51	/	/	/	106.6 ± 3.64

* Mean of five samples for each product (sandwiches).

Table 10. By-weigh analysis of the most preferred modern fast food samples (sandwiches) (*Mean ± SD)

Modern fast foods	Meat/ beef (g)	Meat/ chicken (g)	Egg (g)	Cheese (g)	Bread (g)	Salads (Lettuce & Tomatoes) (g)	Catchup (g)	Mayonnaise (g)	Total weight
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Beef Burger	92.8 ±23.47	/	49.8 ±4.60	12.2 ±1.30	87.8 ±8.72	10 ±1.58	5 ±1	7 ±1.5	252.6 ±23.34
Chicken Burger	/	40.4 ±1.67	46.8	9.8 ±1.48	99 ±1.58	10 ±1	5 ±1	7 ±1.5	206 ±0.70
Chicken Shawrma	/	46.8 ±7.69	/	/	73 ±3.08	17.8 ±2.38	5 ±1	7 ±1.5	137.6 ±4.61
Banneh	/	109.6 ±1.81	/	11 ±1.22	85.2 ±10.84	14 ±1.58	5 ±1	7 ±1.5	219.8 ±9.60
Kebab	43 ±4.18	/	/	/	83 ±4.84	2± 6	/	/	142 ±6.96

*Mean of five samples for each product (sandwiches).

Table 11. Macronutrient content and Total calories of Modern and Traditional fast foods samples (sandwiches) per (100 g) (*Mean \pm SD)

Modern fast foods	CHO %**	Protein %**	Fat % **	Total Calories
	Mean \pm SD	Mean \pm SD	Mean \pm SD	(Kcal/100 g)
Beef Burger	32.7 \pm 3.6	27.7 \pm 3.1	27.1 \pm 3.8	490.2 \pm 56.1
Chicken Burger	1.4 \pm 33.6	18.8 \pm 1.7	26.8 \pm 3.7	370.7 \pm 22.4
Chicken Shawrma	41.1 \pm 1.5	22.1 \pm 2.5	12.4 \pm 0.3	273.9 \pm 10.6
Banneh	33.8 \pm 1.3	22.7 \pm 1.4	25.8 \pm 1.4	443.9 \pm 15.9
Kebab	50.2 \pm 2.7	18.6 \pm 1.2	14.3 \pm 1.3	403.6 \pm 22.6
Traditional fast foods	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Fasolia (White beans)	53.3 \pm 18.7	14.6 \pm 2.9	3.5 \pm 0.5	343.4 \pm 88.9
Haraime	40 \pm 2.3	13.6 \pm 1.1	4.1 \pm 0.4	251.6 \pm 12.7
Tuna and egg	43.1 \pm 12.8	11.4 \pm 1.7	5.5 \pm 0.3	267.3 \pm 58.1
Mshakal (Mixed Falafel and Potatoes)	63.4 \pm 2.9	10.8 \pm 0.9	12.2 \pm 1.2	366.3 \pm 25.7
Mshakal (Mixed Haraime and Foul)	42.4 \pm 1.8	12.5 \pm 0.5	3.3 \pm 0.2	249.6 \pm 8.4

* Mean of five samples for each product (sandwiches).

** % By calculation.

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