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Original Article

Evaluation of Fish Consumption Pattern In Tripoli City –Libya and The Extent of Awareness of Its Importance and Nutritional Value

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Abstract

Food security policies are based on a database collected from different sources including studies on food commodities consumption patterns. Due to the lack of data on fish consumption patterns in Libya. Therefor this study was conducted during the period January 2016 to February 2017 to evaluate the fish consumption pattern and awareness of its quality and nutritive value by the consumer in Tripoli-city, Libya.The study targeted randomly 916 individuals of both genders by questionnaire. The questionnaire's main parts included: demographic characteristics, fish consumption, knowledge of fish, and attitudes towards fish and fishery products. The open stat software package was used to conduct the chi-square test for independence. Nearly 60% of respondents were females while 40% were males. The age category (36-45) was the highest age (34%) among the study sample. Results showed that 98% of the respondents consume fish and 66% of them consume fish one to two times per month. As for fresh and canned fish, data showed that 96.7 and 94.7% of the study sample consume fresh fish and canned fish, respectively. Tuna fish was the most consumed canned fish. Results indicated that the number of times of fish consumption by study participants depends on sex (P=0.000) and type of work (P=0.000). The main types of fish preferred by respondents were sardine (57.6%), sea bream (47%), and mackerel (37.2%). The results revealed that the fish species consumed depend on the income of the study participants (P=0.0001) and the level of education (P=0.007). Per capita consumption of fish reached 21.4 kg/year. The results indicated that there is a need for raising the knowledge level of the population about fish nutritional value and quality. The results also indicated that television was the most effective media for obtaining knowledge about the benefits and use of fish by the respondents (83%). The majority of the respondents (68.9%) proposed reducing the price of fish to promote fish consumption. The study concluded that effective policies should be adopted to educate the population to raise their per capita consumption of fish.

Keywords: Attitude, Canned fish, consumption, Fresh fish, Knowledge.

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Introduction

Fish is an important food material because of its high protein, vitamins, and minerals, as well as an important source of omega-3 fatty acids which have an activity against cancer, prevention of heart disease and atherosclerosis (Abuhlega and Hassan, 2017).

Many studies have been conducted in different regions in the world to evaluate fish consumption patterns and the parameters affecting it. It was reported that the parameters determining the fish consumption including income level; education level; social status; parents influencing in the pattern of fish consumption within the family; religion and awareness of the nutritional value of fish (McManus *et al.,* 2007; Can *et al.,* 2015; Madhavi and Kusuma, 2015; Kumar *et al.,* 2017).

The State of Libya is located on the southern coast of the Mediterranean with a coastline of about 2000 km; Tripoli is the most important city overlooking it, which is the most heavily populated city in Libya (Bureau of Statistics and Census, 2010). It receives an important quantity of fish caught by local fishermen as well as imported fish, however, there are almost no previous studies on the consumption trend of fish in Tripoli city, therefore, the study was conducted to evaluate the fish consumption pattern, estimate current per capita fish consumption, explore consumer knowledge of fish nutritional value and quality, and discover the consumer attitudes towards fish and fishery products.

Materials and Methods

Questionnaire design and data collection

The study targeted randomly 916 individuals in different areas in the Tripoli city, Libya. The study was conducted by a face-to-face questionnaire that was designed by researchers and carried out in the period between January 2016 to February 2017. The questions of the questionnaire were explained and clarified to respondents. The consumed time to fill the questionnaire was approximately 20 minutes. The questionnaire consisted of four parts, part 1: demographic characteristics of respondents (5 questions), part 2: consumption pattern of fish (14 questions), part 3: Knowledge of fish (4 questions), part 4: consumer attitude of fish (3 questions). Some questions have multi-choice responses that can be noted from results.

Questionnaire validity and reliability

A preliminary study was conducted by presenting questionnaire forms to 50 individuals and asked them to fill out it to ensure the validity and reliability of the questionnaire.

Data analysis

The outputs were presented as percentages of frequencies by charts and tables. Per capita consumption of fish was computed as a mean of the sample. Chi squares test was used to analyze the data of the questionnaire using open stat software 2008. A significance level of ($P \leq 0.05$) was used to establish significance.

Results

Demographic characteristics of a study's sample

The demographic characteristics of a study sample were listed in table 1. A total number of 916 individuals of the Libyan population in Tripoli city, Libya participated in the study. Sixty percent of them 60% were females and 40% were males. The highest age category of respondents was 36- 45 with a percentage of 34.0% and the lowest age category was for age category (> 55) with a percentage of 7.3%. More than half of the respondents 54.8% have a university education while 0.5% of the respondents were uneducated. The results also showed that the majority of the respondents (73.6%) worked in the public sector. Meanwhile, 2.30% of the respondents were retired. The monthly income of the study sample ranged from (≤450 to >3000) Libyan Dinar (L.D). The income category (>450-1000) represented the highest percentage of respondents income 46.5% while the income category (>3000) was the lowest percentage among the study sample 3.50%.

Fish consumption pattern

The results of this study (figure 1) showed that 98% of respondents consume fish and fish products while the rest 2% do not consume fish and fishery products. As shown in figure 2, do not like fish and very expensive were the main reasons for non-consumption of fish with a percentage of 16.7% and 16.7%, respectively. It is noteworthy that 44.4% of the respondents did not give a reason for not consuming fish.

The results presented in figure 3 show that the largest percentage of respondents 66% consume fresh fish one to two times per month, 27% consume fish once to twice a week and 5% of respondents consume fresh fish daily. Results from the chi-square test (X^2), indicated a significant association ($P<0.05$) between gender ($P=0.000$) and type of employment ($P=0.000$) with a number of times of fish consumption. While, insignificant results ($P>0.05$) were obtained between age ($P=0.226$), income ($P=0.110$) and education level ($P= 0.569$) with a number of times of fish consumption.

Figure 4. shows categories of fish consumed by respondents. The categories of fish consumed are in descending order include fresh, canned, frozen and salted and smoked with percentages of 96.7, 94.7, 21.8 and 0.98% respectively.

Per capita, fish consumption for the study sample was calculated from the data collected from the respondents. It was found that the per capita consumption of fish reached 21.4 kg/ year.

Types of fresh or frozen fish consumed by respondents were listed in table 2. More than one-third of the respondents frequently buy and consume sardine, sea bream and mackerel with a percentage of 57.6, 47.0 and 37.2%, respectively. Results of statistical analysis revealed that types of fish consumed are dependent on the income of respondents ($P= 0.0001$), and their level of education ($P= 0.007$). Chi test also showed a significant association

of level of education and income (P= 0.000) squares with fish consumed according to their prices.

Table 1. Demographic characteristics of the study's sample (n= 916).

	Characteristics	Number	Percentage
Gender	Male	371	40.50
	Female	545	59.50
Age	18- 25	123	13.4
	26- 35	288	31.4
	36- 45	311	34.0
	46- 55	127	13.9
	> 55	67	7.30
Education level	Uneducated	5	0.50
	Basic education	52	5.70
	Secondary education	187	20.4
	University education	502	54.8
	High education	170	18.6
Type of employment	Public employee	674	73.6
	Private employee	93	10.2
	Retired	21	2.30
	Does not work	128	13.9
Income*	≤450	45	4.90
	>450-1000	426	46.5
	>1000-2000	213	23.3
	>2000-3000	45	4.90
	>3000	32	3.50
	No answer	155	16.9

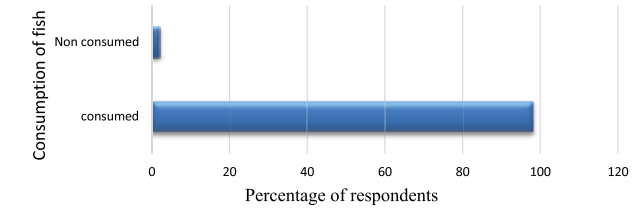

Figure 1. Consumption pattern of fish and fish products of respondents (n= 916).

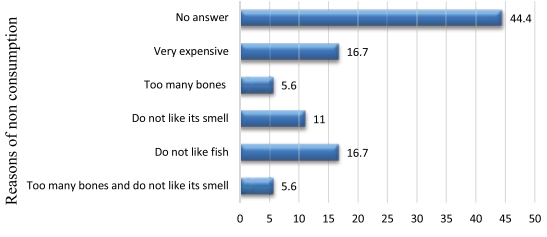

Figure 2. Reasons for not consuming fish by respondents (n= 18).

* Libyan Dinar

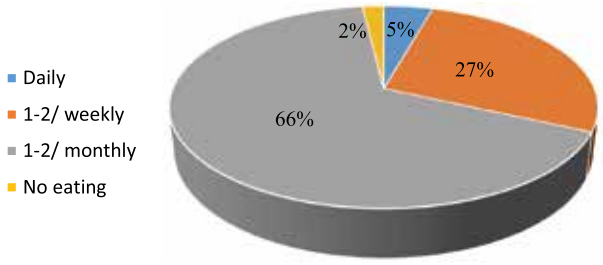

Figure 3 . Times of consumption of respondents for fish (n= 916).

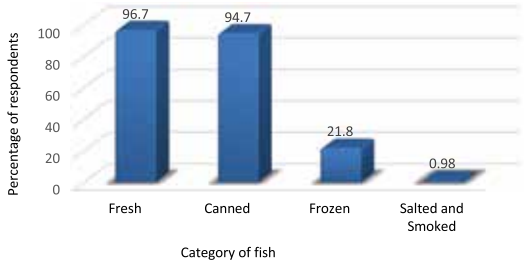

Figure 4. Categories of fish consumed by respondents (n= 898).

Types of fish which are bought and consumed with percentage less than 5% and not listed in the table 2. are bogue (boga), mullet (bouri), horse mackerel (saorow), saddledbream (khala), salema (shelba), greater amberjack (shola), Common dentex (dendshi), Pink dentex (shaghali), Golden grouper (douth),Common sea bream (bakrow), Parrotfish (khazla), tuna (tuna), Grey Trigger fish (halofa), Grape fish (barima), sea bass (karos), octopus (karnit), Sebia (sebia).

The reasons behind respondents,s choice toward a certain fish are illustrated in figure 5. The results showed that 61% of the respondents buy certain type of fish because of their taste while 38 % of them their choice is based on their belief that this type of fish is good for health, meanwhile, 22, 21 and 8% of the respondents buy certain kind of fish because their prices are affordable and fit to budget, high quality and easy to prepare respectively.

Table 2. Types of fresh or frozen fish consumed by respondents.

Common name	Local name	Percentage
Sardine	Sardine	57.6
Sea bream	Warata	47.0
Mackerel	Kawali	37.2
Red porgy	Morgan	20.2
Red mullet	Trilia	18.8
Grouper	Faroug	16.0
Dog fish	Kalb albahr	13.4
Little tuna	Razam	7.00
Shrimp	Gambri	5.70
Moullscs	Rakaweat	5.70

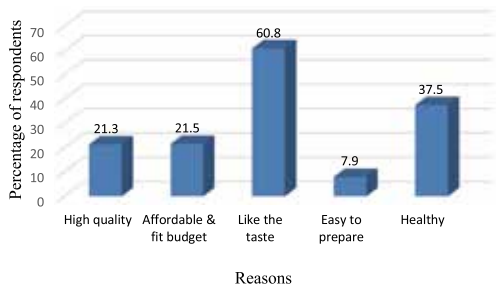

Figure 5. Reasons behind respondents,s choice of buying and consuming certain kinds of fish (n= 898).

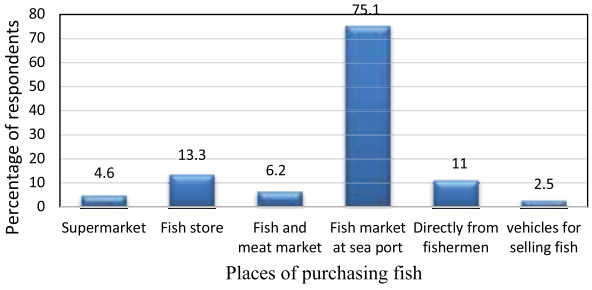

Figure 6. Fish purchasing places of respondents (n= 898).

The results of the this study (figure 6) showed that fish market at seaport is the most popular market for respondents (75%) to buy fish from, followed by the fish store (13.3%), directly from of fishermen (11%), fish and meat market (6%), supermarket (5%) and vehicles for selling fish (3%). Chi-square test did not show a significant association of either gender or education level of respondents with fish purchasing places where P values obtained were 0.485 and 0.616 respectively.

The reasons behind the chosen of certain place for buying fish by respondents are presented in figure 7. The majority of the respondents (82.2%) choose a place of buying fish because of the availability of fresh fish in the chosen place followed by reasons of near my house and cheap with the percentage of 23.6% and 14.3%, respectively.

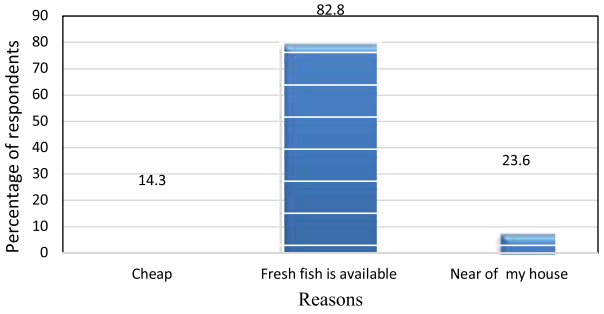

Figure 7. Reasons for purchasing fish from certain markets by respondents (n= 898).

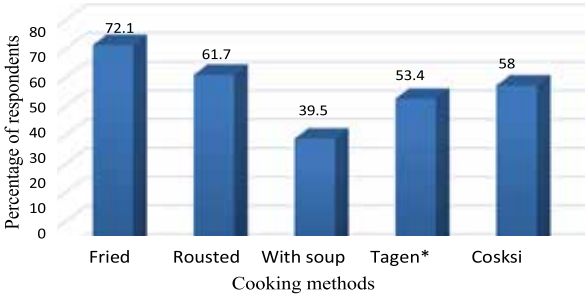

Figure 8. Frequently Fish cooking methods by respondents (n= 898). * Tagine: baking fish with vegetables and tomato sauce in the oven.

Fish cooking methods vary in Tripoli. The most popular methods of fish cooking include frying, grilling, with soup, tagine, and couscous (figure 8). The results from the questionnaires revealed that Frying is the most frequent method of cooking fish (71.1%) by the respondents in this study followed by grilling (61.7).

Canned fish consumption pattern

More than half of the respondents (51.0%) consume canned fish daily followed by one to two times weekly and one to two times monthly with percentages of 31.30% and 14.0%, respectively (figure 9). Canned tuna was the most consumed canned fish by respondents with a percentage of 94.4% followed by canned sardine and canned mackerel with a percentage of 20.1% and 0.98%, respectively (figure10). The results in figure 11 show that 88.4% of respondents consumed canned tuna in sandwiches followed by salad and on pizza with a percentage of 31.3% and 51.5%, respectively. The majority of the respondents (69.2%) consumed canned tuna in breakfast meal in form of sandwiches while 44.4% and 37.9% of the respondents consume canned tuna in dinner and snacks, respectively as shown in figure 12.

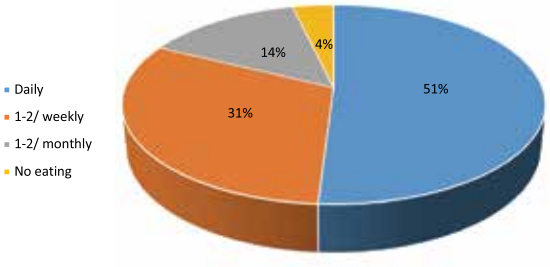

Figure 9. Frequency of canned fish consumption by respondents (n= 916).

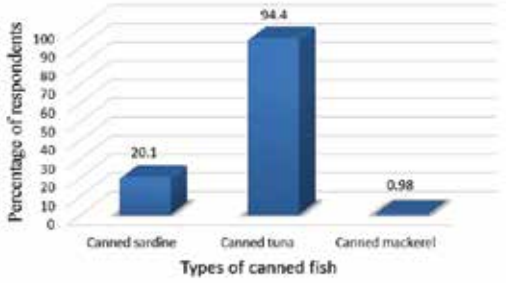

Figure 10. Types of canned fish consumed by respondents (n= 916).

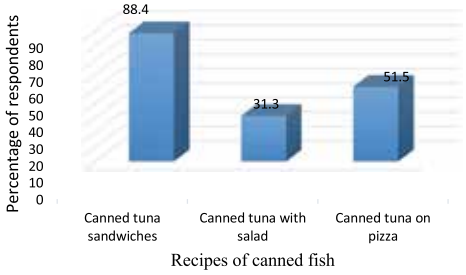

Figure 11. Canned fish recipes consumed by respondents (n= 912).

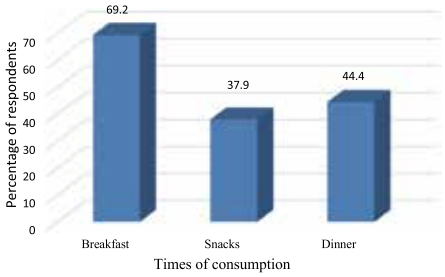

Figure 12. Times of eating canned tuna by respondents (n= 912).

Consumer knowledge of fish

Figure 13 shows fish quality indices identified by respondents which include skin color, gill color, smell, eye condition, and meat firmness. Results indicated that 44% of the respondents know that gill color is one of the quality indices whilst 17.6% of the respondents don't know the quality attributes of fish. Only 32% of the participants in the study were able to identify omega 3 fatty acids as essential fat while the rest (68%) did not know about Omega 3 fatty acids (figure 14).

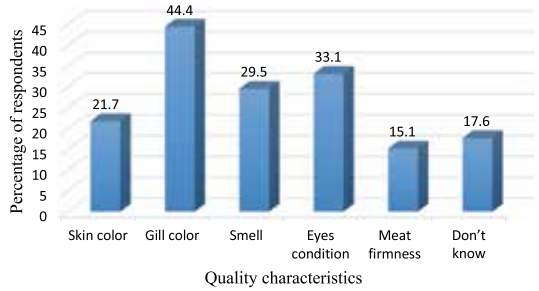

Figure 13. Consumer knowledge of quality indices of fresh fish (n=916).

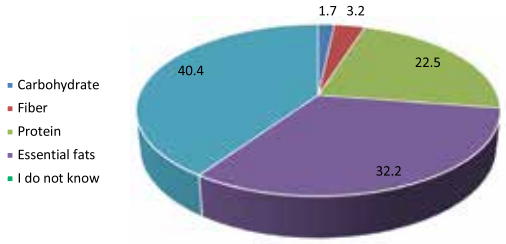

Figure 14. Awareness of omega- 3 of respondents (916).

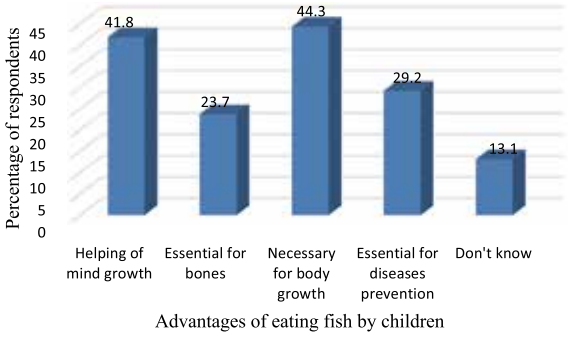

Figure15. Respondents' awareness of the advantages of eating fish by children (916).

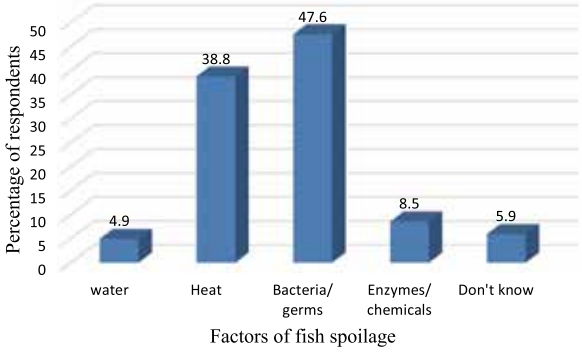

Figure16. Awareness of factors of spoiling fish among respondents (916).

Figure 15 shows the awareness of respondents of the advantages of eating fish by children. Forty-four and 41 percent of respondents know the positive impact of fish on body growth and brain growth of children, respectively. whilst 13.1% of respondents were not aware of the advantages of eating fish by children.

Awareness of factors of spoiling fish among respondents is shown in figure 16. Forty-seven percent and 38 percent of the respondents know that bacteria/germs and heat respectively affect the quality of fish whilst 5.9% of the respondents were not aware of the factors that spoil fish.

Consumer attitude of fish

Table 3 shows the attitudes of the respondents toward some statements about fish. The majority of the respondents (85.6%) agreed that eating fish is good for health. Chi-square test (X^2) revealed an insignificant association between the statement that fish is good for health with gender (P=0.231) and education (P=0.056). More than half of the respondents (50.8%) had a neutral attitude of that fish is always available in the market and 46.3% were of the opinion that cooling fresh fish preserve its quality. Statistical analysis showed a significant association between the statement that fish is always available in the market with gender (P=0.000) and education (P= 0.015). Meanwhile, there was a significant association (P‹0.05)

between the statement that cooling fresh fish preserve its quality with gender (P=0.000) and an insignificant relation with education (P=0.145). The percentage of the respondents who had a neutral attitude of that place where I buy fish is clean and encouraged me to buy fish was 46.6%. The results of statistical analysis indicated a significant association between the statement that the place, where I buy fish, is clean and encouraged me to buy fish with gender (P=0.000) and an insignificant effect with education (P=0.616). It should be noted that 66.2% of the respondents disagreed with the attitude statement that fish is cheaper than meat and chicken. There was an insignificant association between the statement that fish is cheaper than meat and chicken with gender (P=0.117) while a significant effect with education was obtained (P=0.035).

Table 3. Respondents' attitude on some statements about fish.

Statements	Agree (%)	Neutral (%)	Disagree (%)
Eating fish good for health.	85.6	14.3	0.10
Fish is always available in the market.	27.2	50.8	22
Cooling of fresh fish presrving its quality.	46.3	43.3	10.4
The place where I buy fish is clean and encouraged me to buy fish.	41.4	46.6	12.0
Fish is cheaper than meat and chicken.	8.8	25	66.2

The majority of the respondents (83%) chosen television as the most effective medium for getting information about the benefits and use of fish. Whilst 12%, 4% and 1% of the respondents chosen radio, internet, and newspapers as an effective medium for obtaining information about the benefits and use of fish.

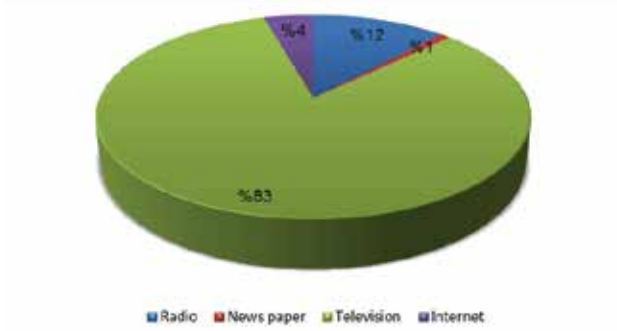

Figure 17.Most effective medium for obtaining information about the benefits and use of fish.

Table 4 shows the various suggestions of respondents as to how to promote fish consumption in Tripoli city. The majority of the respondents (68.9%) proposed reducing the price of fish while 38.5%, 21.30% and 10% of the respondents suggested that the awareness

and guidance about fish benefits, providing fish markets near my house, good health conditions in markets, respectively, promote the consumption of Fish. Small percentages of the respondents suggested that using refrigerated vehicles for selling fish, providing more fish restaurants, supporting fishermen and providing workers, as well as controlling illegal migrants as means for promoting fish consumption in Tripoli city.

Table 4. Respondents' suggestions on the means of promoting fish consumption in Tripoli city.

Means	Percentage
Awareness and guidance about fish benefits.	38.50
Reducing the price of fish.	68.90
Providing fish markets near my house.	21.30
Good health conditions in markets.	10.07
Use refrigerated vehicles forselling fish.	1.09
Providing more fish restaurants.	0.77
Supporting fishermen and providing workers.	0.66
Controlling illegal migrants.	0.77

Discussion

Fish consumption pattern

The problem of the food supply comes the first priority of the five major problems that face the world which are food (poverty), energy, inflation, population and pollution (Jabara and Ratul, 2016). This study is almost the only study conducted to explore fish consumption pattern, knowledge and attitude of fish among a sample of the population in Tripoli city, Libya. The results reveal that 98% of the participants in the study consume fish compared to 2% that do not consume fish. More than half (66%) of respondents consume fish one to two times per month. Similarly, Khan et al. (2018) reported that more than half (52%) of respondents in Sharurah town situated in Najran province, Saudi Arabia consume fish one to two times per month. Chi-square test showed that the number of times of fish consumption by the respondents is dependent on gender and type of employment ($P<0.05$). The sample of the population in Tripoli city consumes mainly fresh (96.7%) and canned (94.7%) fish. It can be perceived that changes in food pattern took place in Libyan society especially the consumption of canned fish in the last decades. The results of this study showed that the estimated per capita fish consumption reaches to 21.4 Kg/year. The FAO (2018), reported that the per capita fish consumption in Libya has grown from 9.0 kg in 1961 to 20.0 kg in 2015 and the preliminary estimates indicated that the increase in growth in 2016 was (20.3

kg) while in 2017 was (20.5 kg). In comparison, the per capita consumption of fish in Antakya city, Turkey was 2.98 kg/person/year (Can et al., 2015). Sardine, sea bream and mackerel are the main types of fish by the respondents with a percentage of 57.6, 47.0 and 37.2%, respectively. According to the respondents, the main reason for choosing these types of fish was its taste with a percentage of 60.8%. The most popular market for respondents to buy fish is from the seaport market with a percentage 75.1%. Similarly, (Amusaiger and Al rumaidh, 2005) found that despite the diversity of fish outlets in Bahrain, 33% of the sample prefer to buy fish from the central market. That can be attributed according to respondents to availability of the fresh fish followed by reasons of near to my house and cheap with a percentage of 82.2%, 23.6%, and 14.3%, respectively. The most popular fish cooking methods are frying (72.1 %), and this is in line with the fact that most fish species consumed are sardines. Similarly, Ahmad et al. (2016) found that deep-fried fish was the most preferred cooking method by the population in Malaysia.

Canned fish consumption pattern

Canned fish was consumed by 94.4% of the respondents, but 51.0 % of the respondents consume canned tuna daily. Similarly, Abuhlega and Hassan (2017) reported that canned tuna was consumed by 77.19 % of males and 80.85% of females among a sample of pupils/ students of primary, and secondary school in Tripoli - Libya. Canned tuna sandwiches were the most recipe consumed by 88.4% of respondents. The canned tuna sandwiches consumed as breakfast by 69.2% of respondents and a similar result was reported by Abuhlega and Hassan (2017) who found that 57% of pupils/students in a primary and secondary school in Tripoli city- Libya consumed canned tuna sandwiches in breakfast time.

Consumer knowledge of fish

Dissemination of food awareness is the important thing to address food security and malnutrition, Studies have shown that the incidence of malnutrition due to lack of knowledge of proper nutrition occur even within the most developed country. Poor people are malnourished because of their economic potential is poor while the rich people are malnourished because of their lack of knowledge of healthy food (Jabara and Ratul, 2016). Fish quality characteristics knowledge was varied among the study sample, whereas respondents did not know all the quality characteristics while 17.6% were not familiar to them. Therefore, there is a need to improve the consumer knowledge in this point. Since 68% of the repondents did not know omega-3 fatty acids, this finding confirms the need of awareness programe to improve the knowledge of the population in Tripoli city about fish nutritional value. The knowledge of benefits from eating fish by children among the study sample was dissimilar. It ranged from not familiar with all the benefits to 13.1% of the respondents have not known any of them. So, there is a need to improve the knowledge in this point. Although 73% of the participants in the study have university educational level however, the results from the study showed that 94% of the respondants were not familiar

with all factors responsible for fish spoilage. These findings reflect an urgent need for plan aiming to educate people about the importance of fish for health and the proper methods of handling fish to keep its quality and safety for consumption.

Consumer attitude of fish

The response of the participants in this study concerning the statements showed in the table (3) reflects the fact that even though 85.6% of the respondents agreed with the statement that fish is good for health, however only 66% of the respondents consume fish 1-2 times per month. This reflects their answer concerning the statement that fish is cheaper than meat and poultry where 66% of them disagree with this statement. These findings reflect the need to find a way of making fish available in the market in enough quantity at an affordable price. It is noteworthy to mention that in Libya the fishing industry depends mainly on foreign manpower (more than 70%). So the availability of fish and stability of prices depends mainly on the availability of the foreigner fishermen. The stability of the exchange rate of foreign currency plays an important role in this matter.

The percentage of the respondents (46.3%) that agree with the statement that cooling fresh fish preserve its quality and 43.3% were neutral toward this statement illustrates the importance of educating people through mass media about the proper way of handling and preserving the quality of fish. The action of 46.6% of the respondents was neutral toward the statement “place where I buy fish clean and encouraged me to buy fish”, this reflects their non-awareness of this matter. This requires the need also to educate them about the importance of cleanness and the availability of proper hygiene conditions in such places to assure fish safety and quality.

Eighty-three of respondents chosen television as the most effective medium for getting information about the benefits and use of fish. This reflects the trend of the population toward watching TV more than listening to the radio and reading newspapers. As a result of this study, education programs about the benefits and use of fish should be displayed on the TV. The majority of respondents suggested that the best means to promote fish consumption in Tripoli city was reducing the price of fish. It is worthy to mention that the rise in prices can be noted in the latest years. As well as an important percentage of respondents (38.5%) suggested the awareness and guidance about fish benefits. The absence of education and information about the health importance of fish effects on consumption fish trend. Also, Al Riyami et al. (2016) concluded that the financial level of people and awareness of the nutritional advantages of fish and the price and availability of fish in the market play an important role in fish consumption by Omanis.

Conclusion

Based on the findings of the study and to enhance food security through the provision of nutritionally integrated food, the study recommends the following: 1- Preparing consumer awareness programs, especially through television, to motivate the consumer to increase the number of times and quantity of fish consumed per week by introducing their nutritional value and preparation methods. 2- Conduct more comprehensive studies to study the role of fish in the diet and the amount of actual intake instead of relying on annual fish statistics that do not give enough indicator. 3- Encouraging the private sector to invest in the canning industry due to the large trend of canned fish consumption. 4- Similar surveys should be conducted regularly, at least every five years and used as a reference for monitoring behavioral changes in fish consumption habits.

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ورقة أصيلة

تقويم النمط الاستهلاكي للأسماك بمدينة طرابلس – ليبيا ومدى الوعي بأهميتها وقيمتها الغذائية

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المستخلص

تعتبر دراسات نمط الاستهلاك للمواد والسلع الغذائية من أهم البيانات التي يستند عليها في وضع السياسات الخاصة بالأمن الغذائي. نظرا لعدم توفر دراسات محلية عن نمط استهلاك الأسماك، أجريت هذه الدراسة خلال الفترة من يناير 2016إلى فبراير 2017 بهدف تقويم النمط الاستهلاكي للأسماك، والتعرف على مدى وعي المستهلك بمدينة طرابلس بجودتها وقيمتها الغذائية. استهدفت الدراسة عدد 916 فردا عشوائيا من الجنسين، وتم استطلاع آرائهم من خلال استبانة نوع وجه لوجه. تضمنت الاستبانة أربعة أجزاء: اشتمل الجزء الأول علي معلومات شخصية عن المشاركين في الدراسة، والجزء الثاني عن نمط استهلاك الأسماك، والجزء الثالث عن مدى الوعي بالقيمة الغذائية وجودة الأسماك، أما الجزء الرابع فتضمن أسئلة عن الانطباع عن الأسماك ومنتجاتها. تم استخدم البرنامج الإحصائي Open stat software package في أجراء اختبار مربع كاي لاختبار الاستقلالية. كانت نسبة الإناث في العينة (60%) أعلى من الذكور (40%) والفئة العمرية (36-45) مثلت أعلى نسبة من المستجيبين للدراسة. أظهرت نتائج الاستبيان أن 98% من عينة الدراسة يستهلكون الأسماك، ونسبة 66% من العينة يستهلكون الأسماك بمعدل مرة إلى مرتين في الشهروأن 97% و95% من العينة يستهلكون الأسماك الطازجة والمعلبة على التوالي، وكانت معلبات التونة الأكثراستهلاكا مقارنة بمعلبات السردين والماكريل. أشارت النتائج إلى أن عدد مرات استهلاك الأسماك من قبل المشاركين في الدراسة يعتمد على الجنس (P= 0.000) ونوع العمل (P= 0.000). أما فيما يخص أنواع الأسماك المفضلة فكانت على التوالي 58% سردين، 47% وراثة و37% ماكريل. كشفت النتائج – أيضا - أن أنواع الأسماك المستهلكة تعتمد على دخل المشاركين في الدراسة (P= 0.0001) ومستوى التعليم (P=0.007) . وبلغ متوسط استهلاك الفرد من الأسماك في عينة الدراسة 21.4 كجم/للفرد/السنة. أوضحت نتائج الدراسة الحاجة الماسة إلى رفع مستوى وعي المستهلك بالقيمة الغذائية للأسماك وجودتها. كما تبين –أيضا-أن القنوات المرئية كانت المصدر الأكثراعتمادا عليه في الحصول على المعلومات عن القيمة التغذوية للأسماك، وأن 67% من عينة الدراسة اقترحوا خفض أسعار الأسماك كوسيلة لتشجيع الإقبال على الأسماك. خلصت الدراسة إلى ضرورة العمل على وضع سياسات أكثرفعالية اتجاه تثقيف وإرشاد المواطنين على تشجيعهم للإقبال على استهلاك الأسماك ورفع عدد مرات الاستهلاك في الأسبوع.

الكلمات الدالة: أسماك طازجة، أسماك معلبة، استهلاك، المعرفة، انطباع.

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