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The extent of citizens' knowledge of preservatives and their health effects

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Abstract

Food technology has witnessed remarkable progress during the past decades through the manufacture of various types of food additives, which are estimated at 2500 types added to food to become better specifications in terms of: nutritional value, color, flavor and stability, so it is very important to know the effect of preservatives that are added to food during conservation operations Without damage for a temporary or permanent period. This study aims to identify preservatives (their uses and risks) from the consumer point of view and to verify the extent of citizens' knowledge of the basic variables related to the acceptance of food additives. To achieve the goals of the study, an electronic questionnaire consisting of more than (60) questions was downloaded across all social media, the site of the University of Babylon and the College of Basic Education, with the participation of (105) people. The questionnaire included nine axes consisting of: general information about preservatives and their types, industrial preservatives, how to preserve food, its harms, alternatives, pharmaceutical preservatives, preservatives in juices and finally barbic acid. The SPSS program was used to statistically analyze the questionnaire data. The results showed that the cognitive assessment of preservatives by participants was average based on the values of the standard deviation and the mean of the mean (0.421 -1.615) and (1.25- 3.05), respectively, as well as the values of the standard deviation The mean of harm to the use of preservatives in food was recorded: (0.925), (1.69), which indicates that the mean cognitive level of people participating in the questionnaire.The value of the significance level ($\alpha \leq 0.05$) showed that there were no statistical differences about the opinions of participants on the importance or lack of preservatives, and therefore the citizens' awareness about the use of preservatives in food falls on individuals and relevant

government institutions, as well as intensifying studies and research that show the facts of use All preservatives in all foods.

Keyword: *Preservatives, Citizen Awareness, online questionnaire, the benefits and risks of preservatives, SPSS program.*

Problem of the Research

The study problem is defined in the following main question: The extent of consumer knowledge about the uses of preservatives in food, medicine and juices and their future effects on human health.

Aims of the Research

The current study aims to extrapolate the knowledge level of citizens in general, and university students in particular, of preservatives added to food, their types, the reasons for their use, and how to read the food label, in addition to knowing the most important natural preservatives that are used instead of industrial ones when chemical and physical preservation, as well as the research shows the most important Diseases resulting from excessive use of preservatives, along with a review of the most important solutions that can be taken to reduce the effects of preservatives through the proposals made by the participants in the online survey.

Research importance

Educating and introducing the people participating in the questionnaire to avoid the frequent use of food preservatives due to the chemicals they contain harmful to health, especially the health of children, as well as limiting the consumption of canned foods of unknown source and whose expiration date has not been proven, thus they pose a risk to human health.

1- Introduction

Currently, obtaining adequate food is one of the most important problems that humanity suffers from despite scientific progress, and its solution lies in providing every person in the world with an adequate amount of proteins, fats and sugars, but the danger to health in the current century is not in adequate food, but in unhealthy nutrition. "In other words, getting the right food at the

right price at the right time has become one of the most important factors in enjoying a healthy life". The task of preserving food has become a necessity to support the required quantities of food, so it has become imperative to know the effects of food additives including (preservatives) during preservation operations to ensure the validity of the food item without damage, whether for temporary or permanent preservation (1-3).

Food additive is a substance that is added to food and does not change its qualities, but it has an important role in preserving foods for long periods without spoilage / destructible, so it is very important to improve the properties of the products when adding them. Moreover, food additives are used in one of the stages of plant growth so that they are absorbed by the roots and can be added in different stages including: harvesting, canning, processing, storage and during marketing in order to improve the quality of food or increase its consumption. The purpose of using food additives includes: increasing the nutritional value such as adding some vitamins or mineral salts such as:(adding vitamin B complex compounds to bread and flour, vitamin D to milk, vitamin A to butter and iodine to table salt), improving quality such as:(coloring, stabilization, bleaching and perfumed materials), reducing spoilage and improving preservation quality such as:(adding sodium carbonate to bread or adding ascorbic acid to cheese prevents the growth of fungi on it), makes it easier to prepare food such as:(emulsifiers that mix fats with water), and reduce food prices as preserving food for longer periods leads to its availability in most seasons such as vegetables and fruits (4).

Under the supervision of the European Food Safety Authority, the European Union has divided food additives into 6 groups: preservatives, food additives, coloring agents, flavoring agents, textile agents and various agents (5). The specialists in the countries of the European Union have agreed to standardize the names of these substances that are allowed to be added, whether they are natural (animal or vegetable) or industrial materials, by placing the letter (E) attached to certain numbers indicating these materials, as the numbers of colored materials are 100-199 and preservatives 200 -299 and catechins 300-399 and finally emulsifiers and stabilizers 400-499. Preservatives are one of the most important food additives, and they are chemicals designed to preserve the appearance and taste of prepared foods for as long as possible, but they have also become present in fresh foods such as vegetables and fruits by spraying them with these chemicals to keep them fresh for the longest period. Preservatives have been divided into three

smaller functional groups: antimicrobials that stop bacterial growth, antioxidants that slow lipid oxidation, organic substances that cause bad odors, and antibiotic agents (6-9), see table.

Table 1: Types of preservatives and their applications (10)

S.No	class	Preservatives	Applications
1	Anti-microbial	Nitrites, Nitrates, sulfur - dioxide, benzoates and sorbates.	**Destroy or delay the growth of bacteria, yeast, molds.**
2	Anti-oxidants	Butylated Hydroxyl Anisole(BHA), Butylated HydroxylToluene (BHT) ascorbic acid.	**Slow or stop the breakdown of fats and oils to prevent rancidity.**
3	Anti-enzymatic	ascorbic acid and citric	**Block the process during ripening and harvesting**

The preservatives most used are:

- Benzoate and benzoic acid: it is used in the manufacture of soft drinks, jams, fruit juices, and ascorbic acid used to preserve pickles, cheese, sweets and processed meats.
- Propionic acid and its salts: used as a preservative for bread, sweets and desserts.
- Sulfur dioxide: It is used in drying fruits and vegetables such as apricots and raisins, and in making biscuits.
- Nitrate salts: used in processed meats such as pastirma and luncheon meat.

The preservatives less used are:

- Hydrogen peroxide: used to preserve milk, as it is added at a concentration of up to 1000 parts per million.
- Sodium Chloride: It is added for storing butter, margarine and fish.
- EDTA: It acts as a preservative in neutral and alkaline media such as salad and fish.
- Propyl gallate (PG): It is used as an antioxidant and is added to preserve oils and fats (10, 11).

The World Health Organization has set fixed schedules for the minimum concentrations of preservatives that are used for different types of food, provided that the proportions of these substances do not exceed the international permissible limit. Exceeding the permissible limits leads to the accumulation of these substances in the human body, which causes some direct and indirect health damages, which depend on the amount of food consumed by the person that contains these substances (4, 12).

The most important health risks of preservatives are:

1.The accumulation of additives in the various organs of the human body: they cause various cancerous diseases due to the high levels of these substances in the blood, such as cancerous diseases in children when they eat large quantities of chips.

2. The problems of hyperactivity and activity in children: It is a result of the dissolution of preservatives in their diet, such as canned juices that contain artificial colors.

3.The deterioration of heart health: Research indicates the possibility of narrowing blood vessels when food contains percentages of sodium benzoate and becomes less soft and hard, which leads to various heart diseases such as soft drinks that pose a threat to human health.

4. Diabetes: The Harvard School of Global Health has proven that sodium nitrate affects the efficiency of diabetes treatment and may be responsible for the development of some types of diabetes, such as sweets and meats that contain high levels of fat.

5. Increase the level of cholesterol in the blood: Most meats with added preservatives contain high levels of fat.

6. Kidney deterioration: Many foods contain additives such as phosphates that enhance taste and texture and cause kidney problems, such as soft drinks.

7. Infections and disorders in the brain and nerves, especially in children: The protective barriers of their nervous system are weak, which makes them suffer from some diseases, including:

- Behavioral hyperactivity: It is a type of psychological disorder and behavioral excitement in children. It is represented by a low level of mental focus, also known as low concentration and hyperactivity disorder.
- Chronic Migraine Disease: Caused by a substance called tartrazine called E102, which causes severe deficiency of vitamin B6, which is required for the growth and activity of nerves and the brain, whether in children or adults (16-13), so be careful when buying it, see Table 2 and 3.

Table 2: Symbols installed on food products that cause human disease

Causes digestive disorders	Questionable in it	It causes cancer	It is banned internationally	Causes skin sensitivity	Causes intestinal disturbances	It causes blood pressure	It raises cholesterol	Serious
E330	E104	E131	E103	E230	E211	E250	E320	E102
E339	E122	E142	E105	E231	E222	E251	E321	E111
E340	E141	E210	E111	E232	E223	E252		E120
E407	E150	E211	E121	E233	E224			E124
E450	E151	E330	E125	E311				E127
E461	E153	E212	E126	E315				
E462	E171	E213	E130					

E463	E173	E214	E152					
E464	E180	E215	E161					
E465	E440	E217						
E466	E241	E339						

Table 3: Permitted quantities in some food additives

Chemicals	Food	Allowed quantity
Salts of NaNO3-kNO3	Meat and its derivatives	%0.3
SO3 gas	Wine	Gazhar 0.06%
H_2SO_3 acid	Wine	Associated acid 0.04%
	Dried fruits vegetables - syrups according to the period of storage	(0.1- 0.125) %
	Fruits and vegetables dipped in sulfuric acid	0.2%
	Pureed fruits and veggies and intense juice	0.125%
Benzoate acid and its salt sodium benzoate	Fruit and canned products	0.10%
	Fish, hydrogenated oils, and margarine	0.02%
The ethyl propyl ester of aqueous benzoate acid	Fruit and vegetable products, canned fish and hydrogenated oils	0.10%
P - Hydroxi benzoic Acid	Food gelatin	0.02%
Ant acid	Fresh fruit juice and fresh fruit puree	0.15%
	Fruit juices	0.1%
Sorbic acid	Pureed fruits and vegetables, concentrated juice and tomato paste	0.1%
Potassium sorbic salts	Pickled or pickled cucumbers unpasteurized and tomato puree prepared for processing	0.15%
Sodium nitrate	Meat and it derivatives	0.02%

In 1986, the food standard specifications in Europe declared that every food must contain a label, and it is known that it is any statement, illustration or description mark, whether pictorial or

written, either printed, affixed, engraved or attached firmly to the food package, in addition to that it contains names Each component of this food is arranged in descending order depending on the weight when preparing or manufacturing this food, including water if it is one of the ingredients and excluding the flavorings (17, 18).

1.2- Research procedures

1.1.2-Research methodology

The study followed the descriptive and analytical approach, and the descriptive analytical approach is the one that studies a phenomenon, event or issue that currently exists from which information can be obtained that answers the study questions without the researcher's intervention in it.

2.1.2-Research community and sample

The study community is formed by downloading an online survey across all social media (WhatsApp, Viber, Instagram, Facebook, Telegram, Classroom ...etc).

2.1.3- Field study sample

A random sample was chosen to fill out the study questionnaire for all levels of education in the university community. The number of questionnaire questions was approximately (105).

2.2- Study tool

A questionnaire was prepared containing the study tool according to the following steps:

An open questionnaire containing a number of questions was directed to community members on official and unofficial social media sites.

-Some paragraphs of the questions have been modified for the research subject, according to the observations of the academic evaluators specializing in the field of sociology and psychology.

-The field sample was taken from the questionnaire, which was edited electronically on 11/01/2019 until 05/01/2020, the number of participants was approximately 105 for different age groups and the number of questions was more than 60 questions.

- The answers of the participants in the questionnaire were collected and analyzed through the SPSS program.

3. Results and discussion

An electronic form was downloaded to study awareness of preservatives, their types, and their future effects on human health. The questionnaire was divided into nine aspects that included: information on preservatives, industrial preservatives, food preservation, and types of preservatives, harms caused by preservatives, alternative materials, medicinal preservatives, preservatives in juices, and propionic acid, and the study sample was approximately 105 participants.

●Descriptive statistics of the questionnaire aspects

The mean is applied, which equals the sum of the values divided by their number as in the equation 1: $\bar{x} = \frac{\sum_i^N x_i}{N}$equation (1)

In addition, the standard deviation was used, which expresses the extent of deviation of the values from their arithmetic mean, as in Equation 2:$\sigma = \sqrt{\frac{1}{N}\left(\sum_i^N x_i^2 - N\underline{x}^2\right)}$ equation (2)

The following is the calculation of the mean and standard deviation for all the questionnaire variables.

Table 4: Frequencies and percentages of variables: gender, age group, educational level and career state

variable		Repeat	%ratio
Type	Male	47	45.2
	female	57	54.8
Age group	under 18 years old	4	3.8
	18 - 28 years old	83	79.8
	28 - 38 years old	8	7.7
	38-48 years old	7	6.7
	Over 48 years old	2	1.9
Educational level	Less than secondary	0	0
	secondary	15	14.4
	Bachelor	72	69.2
	Higher diploma or master's	6	5.8
	PhD	4	3.8

	Other	7	6.7
Functional status	Full-time work	16	15.4
	Student	81	77.9
	retired	2	1.9
	Unemployed	1	1
	Other	4	3.8

Table 4 shows the percentage of male participants, which is 45.22%, while the percentage of females is 54.8%, and the participation rate for the age group between 18-28 years is 79.8%. For the bachelor's degree, 69.2%, and the lowest percentage for higher degrees (master's and doctoral degrees) 3.8%. As for the career state, the highest response rate for students is 77.9% and the lowest percentage for the unemployed is 1%. Figure 2 shows each variable with the percentage of participants in the questionnaire.

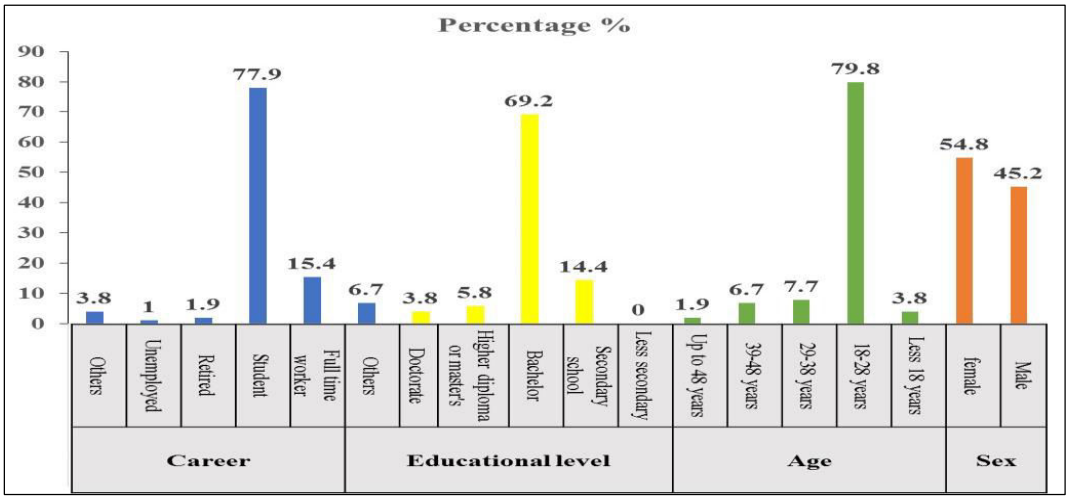

Figure 2: Percentage of participantsto the questionnaire in terms of demographic variables.

Table 5: The mean and standard deviation of the first aspect questions (information on preservatives)

No. item	item	SMA	standard deviation
1	How are preservatives obtained	2.73	0.827
2	How well do you know about preservatives	1.84	0.640
3	How well do you know about foodstuffs that contain preservatives	2.08	1.220
4	Preservatives are organic and inorganic	2.80	0.928
5	What are the preservatives used in the past	1.75	0.890
6	Preservatives used in the past have had an impact in terms of their use	1.76	0.661
7	Can preservatives be added to baby or infant food?	1.94	0.964
8	Preservatives have been used since ages	1.25	0.650
9	Preservatives keep food for longer periods without spoilage	1.68	0.927
10	Do industrial preservatives have health risks?	2.08	0.992

11	Do you think preservatives are important?	2.44	0.901
12	Does state law allow the use of preservatives?	3.05	1.615
13	What percentage of foods are added preservatives?	2.01	0.675
14	Which of the following methods man has resorted to since ancient times in preserving food, and it was one of the primitive methods	2.57	0.760
15	Preservatives	1.87	0.962
16	Do you use natural or manufactured coloring materials in the food industry?	1.69	0.925
17	Not all foods with preservatives are harmful	1.91	0.421

It is noted from table 5 that the arithmetic averages of the respondents' answers to the information paragraphs on preservatives ranged between (1.25- 3.05) and the standard deviation (0.421 - 1.615) with an average evaluation. The highest ranking was seen for the paragraph: Does state law allow the use of preservatives where the mean was (3.05) and the standard deviation (1.615) with the average classification, and the second rank for the paragraph: Preservatives are organic and inorganic with a mean (2.80) and a standard deviation (0.928)) With a medium estimate, and the last rank was a paragraph: The use of preservatives since ages with an average of (1.75) and the standard deviation (0.650) with a low degree, and this indicates that the cognitive reality of the information about preservatives is medium.

Table 6: The mean and standard deviation of the second aspect questions (Industrial preservatives)

No. item	item	SMA	standard deviation
1	What are industrial preservatives?	3.12	1.188
2	The most important diseases caused by the use of preservatives in our daily food	2.88	1.046
3	How to avoid artificial preservatives	2.81	0.825

Table 6 shows that the standard deviation coefficients between the scores of the sample members in the two applications for the tool domains ranged between (0.825-1.188), which is one of the statistically significant values at the level of significance (α 0.05), and the value of the correlation coefficient between the two applications of the scale in total was (0.735) It is also a statistically significant value.

Table 7: The mean and standard deviation of the third aspect questions (food preservation)

No. item	item	SMA	standard deviation
1	The process of preserving food is dividedinto.	2.25	0.570
2	The main motive of food preservation is to ensure that food is suitable for consumption for a long period of time	2.03	0.950
3	Preservatives cannot be used on many foods	3.74	1.386

4	Some studies indicate that there is an increase in excessive movement of children at age.Due to their eating foods that contain preservatives.	1.64	0.944
5	Cutting out preservatives does not affect some foods	2.23	0.611
6	In your opinion, are preservatives more dangerous for children than adults?	2.11	0.944

Table 7 shows that the arithmetic mean of the responses of the sample members on the paragraphs of this axis, where the mean values ranged between (1.64 - 3.74), while the values of the standard deviation ranged between 0.570 and 1.386 and a mean evaluation score. Paragraph No. (3) came first in this field with an arithmetic average (3.74), a standard deviation (1,386) and a high evaluation score, while paragraph No. (4) came in the last place with an arithmetic mean (1.64) and a standard deviation (0.944) with a low rating. From this, we conclude that the use of food preservation methods was average. As for Table 8, it appears that the mean and the standard deviation were high for the responses of the sample members to the paragraphs of the second field (the main motive for preserving food ...).

Table 8: The mean and standard deviation of the fourth aspect questions (types of preservatives)

No. item	**item**	**SMA**	**standard deviation**
1	Sodium benzoate is a widely used preservative for its anti-bacterial properties	2.29	0.809
2	It is one of the toxic preservatives that is commonly	2.12	0.917

	used to preserve cosmetics and foods that contain fats		
3	How much is the daily dose of sodium benzoate to equal one kilogram of body weight?	1.59	0.705
4	Do you think that mixing sodium benzoate with artificial colors that are added to food increases hyperactivity?	2.59	0.925
5	How well do you know that sulfur dioxide is a preservative and an antioxidant?	2.19	0.925
6	Sodium nitrate is found naturally in foods containing vitamin C.	2.15	0.890
7	What is the percentage of sodium nitrate that equals a kilogram of body weight	3.03	1.083
8	Does using large amounts of sodium nitrate can lead to colon and stomach cancer?	1.95	0.978

Table No. 8 shows the responses of the sample members on the (types of preservatives) aspect, where the mean rates and the standard deviation ranged from (1.59 - 3.03) and (0.705 - 1.083) respectively with a medium rating score. The highest value for point (7) was recorded with an arithmetic mean (3.03) and a standard deviation (1.083) with a medium rating score, while the lowest value for point (3) was recorded with an arithmetic mean (1.59) a standard deviation (0.705) with a medium rating score. This indicates that community members' knowledge of the types of preservatives added to foods was moderate.

Table 9: The mean and standard deviation of the fifth aspect questions (Preservative damage)

No. item	Item	SMA	standard deviation
1	Obesity in some people is one of the harms caused by preservatives	3.03	1.083
2	Diabetes is not among the diseases of artificial preservatives	1.93	0.978
3	Preservatives are dangerous for children because they cause vitamin B deficiency	2.44	0.901
4	Preservatives are 40% of the health benefits of food and drink, especially in most fruits and vegetables	3.05	1.615
5	The harm of preservatives and colors be	2.01	0.675
6	Preservatives prevent the body's immunity from the bacteria that cause rashes	2.57	0.760
7	The harmful effects of preservatives on the human body in terms of breathing, such as asthma and bronchitis	1.87	0.962
8	One of the harms of preservatives is to reduce calories by	1.69	0.925

9	The preservative flavor is 20% less than fresh food, as a minimum, and it may increase the more preservatives in the made toppings.	1.91	0.421

Table No. 9 shows that the rates of the arithmetic mean and the standard deviation of the responses of the sample individuals on aspect "harm to preservatives" (1.69-3.05) and overall arithmetic mean (2.56) with a medium evaluation score. The highest value of point (4) was recorded at 40% with an arithmetic average (3.05) a standard deviation (1.615) with a high evaluation score, while the lowest rate were recorded for point (8) with an arithmetic mean (1.69) and a standard deviation (0.925) with a medium evaluation score. This indicates the need to educate community members about the harms of preservatives used in food.

Table 10: The mean and standard deviation of the sixth axis questions (alternative materials)

No. item	**Item**	**SMA**	**standard deviation**
1	Are there alternative natural materials for preservatives?	1.48	0.809
2	Honey helps preserve materials and store food for a period of one week to a month because it contains antioxidants	1.77	0.917
3	Not all foods contain harmful preservatives, but there are natural preservatives	1.00	0.705
4	How well do you know that adding BHA and BHT to food causes cancer?	2.56	0.925
5	There are many natural and synthetic scented materials	1.85	0.925

	that are used in the manufacture of many different foods		
6	Coca is a food enhancer that is extracted from coca leaves and sweets	1.97	0.890
7	How well do you know adding saccharin and aspartame, which are considered local materials in the manufacture of various foods	2.35	1.083

Table 10 shows the opinions of the study sample members about the reality of using alternative materials in food preservation according to the variables: gender, age group and scientific qualification, as it recorded (1.48-2.56) for the arithmetic mean and (0.809 to 0.925) for the standard deviation, moreover, it can be seen that there are no differences between the mean and the standard deviation of the answers of the study sample individuals in aspect (6).Furthermore, there are no differences at the level of significance ($\alpha \leq 0.05$).

Table 11: The mean and standard deviation of the seventh aspect questions (Preservatives)

No. item	**Item**	**SMA**	**standard deviation**
1	Is paraben a preservative that is used in the pharmaceutical and food industry?	1.98	0.945
2	Preservatives have side effects such as allergies, sterility, or cancer	1.75	0.810

It can be seen from Table No. 11 that there are no apparent differences between the arithmetic mean(1.75 and 1.98) and the standard deviation (0.810 and 0.945) of the responses of the study sample individuals from the seventh aspect (pharmaceutical preservatives).

Table 12: The mean and standard deviation of the eighth aspect questions (Preservatives in juices)

No. item	Item	SMA	standard deviation
1	The acid used in drinks, juices, and jam is....	1.50	0.824
2	Are there natural preservatives that can preserve the shelf life of juices?	2.19	0.871
3	Does putting sugar in large quantities in juices contribute to preserving them for a long time?	2.09	0.967
4	Roasters add a pleasant flavor to soft drinks, fruit juices, jams, juices, and other foods	1.97	0.970
5	Among the most popular preservatives is propionic acid and its salts	2.22	0.723
6	How well do you know that adding spices like black pepper or essential oils has the ability to prevent microbial activity	2.17	0.380

The eighth aspect related to preservatives in juices and its paragraphs in table (12) show that there are apparent differences between the arithmetic mean (1.50 - 2.22) and the standard deviation (0.723 - 0.824).

Table 13: The mean and standard deviation of the ninth aspect questions (propionic acid).

No. item	Item	SMA	standard deviation
1	The acid used in preserving meats, desserts and bread is	2.09	0.936
2	Do you agree that nitrite salts are used with table salt in order to preserve meat or other foods?	2.09	0.967
3	Citric acid was previously extracted from citrus fruits, but now it is produced by fermentation	2.22	0.723

It can be seen from table 13 that there are no differences in the arithmetic mean, a same value was recorded for point 1 and 2 and it was (2.09), while the highest arithmetic average was noted for a point 3 and it was (2.22) with a standard deviation (0.723) and wia high rating, in addition to that the total arithmetic mean was recorded (2.13) with a medium rating score.Therefore, Tables (5-12) showed:

1. There are apparent differences between the arithmetic mean of the responses of the individuals of the study sample, the preservatives added to the food and drug stuffs and juices according to the variables: (gender, age group, educational level and career state).

2. The results showed that there were no statistically significant differences at the significance level ($\alpha \leq 0.05$) between the opinions of the study sample individuals about the reality of using food preservatives.

Conclusions and recommendations

Conclusions

1- It is imperative to find an alternative when there is a need to use preservatives.

2- Food additives are harmful to the accumulation of large quantities of them in our bodies due to our daily frequent use of multiple varieties of various canned foods.

3- Motor hyperactivity is a type of psychological disorder and behavioral frenzy in children. We have suffered from it greatly in recent decades and is represented by a low level of mental focus.

4- Preservatives are chemicals that must be studied extensively before their use and even after their consumption.

5- Preparing fast and light meals at home to replace prepared foods.

Recommendations

Through what was reached in the study sample, the researchers recommended the following:

1. The necessity to conduct research to determine the effect of preservatives on human health.

2. Increasing health awareness about preservatives in general.

3. Conducting more studies on food preservatives, and taking the results of studies.

4. Conducting training courses in the field of food preservatives and their types.

5. Conducting studies to detect the degradation of preservatives and discover less harmful types.

6. Stay away as much as possible from eating ready-made and canned foods that contain preservatives of all kinds, including snacks, canned foods, drinks, and others.

7. Spacing the time periods in which foods are eaten.

8. Get rid of preservatives in food by washing and heating.

9. Tightening food control over processed foods and making comprehensive health awareness in the media about preservatives and their alternatives.

10. Keeping a miniature copy of the previous tables and placing them in a suitable place for use when reviewing the components of any product before purchasing it.

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