
***SURVEY STUDY ON SOME ARTIFICIAL COLORS
INTAKE BY CHILDREN IN DAMIETTA***

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***SURVEY STUDY ON SOME ARTIFICIAL COLORS
INTAKE BY CHILDREN IN DAMIETTA***

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Abstract

Food is essential for the proper growth and development of children, and excessive consumption of artificial colors in baby foods is a serious health problem that has a negative impact on the growth and health of children.

The aim of this study was to evaluate a survey of artificial colors in children's foods in Damietta governorate in children aged between 1 and 7 years and its impact on the child's general health, especially anemia in children.

The study included 200 children from nurseries and primary schools in Damietta Governorate, and we conducted a survey of children's sweets in the supermarket to determine the industrial colors, especially the industrial color of tartrazine(E102)and the industrial color of carmoisine (E122). Baby foods such as jelly, soft drinks, Lolita and Children's Candy. We analyzed the concentrations of the synthetic colorant tartrazine (E102) and the synthetic colorant carmoisine (E122) in baby foods in (HPLC) Chromatograph.

We analyzed anemia before giving the children the artificial colors in the baby sweets. Then we analyzed after giving the children sweets containing the artificial colors.

The results showed that children at the age of three years ate more children's foods containing artificial colors the most consumed of food for children by a percentage of (56.71%)and then the percentage started to decline for the following are age groups.

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The percentage of consumption of baby food in the second year of the age stage is (33. %) and the percentage of consumption of baby food in the fourth year of the child's life stage is (12.95%) As for the percentage of consumption of baby food in the fifth year of the child's life stage, (4.85%) and the consumption rate in the seventh year of the child's age stage is (12.91%). The results showed that the percentage of the intake of children's sweets in different samples of tartarazine (102) that were analyzed on the HPLC device was less than the international permissible, as it was found that the percentage of 100 mg of Lolita, the percentage of fortification in it of the substance of tatarazine is about 33.59 micrograms and the percentage of 100 mg of soft water Maxi apple is approx. 19.23 µg / Likewise, jelly straw jelly, the concentration ratio is about 14.71 mg, the concentration ratio in UGO carbonated water is 13.21 µg, and the concentration ratio in Orange jelly is 17.02 mg . it becomes clear that the average concentration of tartarazine (E 102) in the foods that the children ate (the research sample) was less than the international permissible (7.5 mg per kilogram of the human body) .

The results of carmosine showed that it is less than the permissible limits

it becomes clear that the average concentration of carmosine (E 122) in the foods that the children ate (the research sample) was less than the international permissible (4 milligrams per kilogram of the human body).

The results showed That there was a significant effect of the number of intake times on hemoglobin Levels after eating children's food , where the value of "P" < (28.31%) and The level of significance reached (0.0001) Indicating the presence of statistically significant differences between the number Of intake and this led to a high rate of anemia among children the research sample after eating children's food

However, previous research is still proving that tartrazine is a toxic pigment, and in this study we showed not a harmful effect of tartrazine and

carmosine on children's anemia, and it was measured by doing an anemia test for children, and the results confirm that.

Keywords: artificial colors; tartrazine; Carmoisine; anemia .

INTRODUCTION

The color plays a significant role in acceptability of food stuffs, but unfortunately not all coloring agents are harmless. However, there was an increase in the use of toxic synthetic colorants over the last 30 years (*Sawaya et al., 2008*).

In Egypt, there has been a sharp increase in the use of synthetic food colorants in the past few years (*Amin et al., 2010; El- Sheikh; Al-Degs, 2013*).

Food colorants (dyes) play vital role in the selection of food. They are used in food to improve appearance, enhance attraction, prevent loss of color when processing or storing foods, and stimulates psychological satisfaction (*Amin et al., 2010*).

Food additives are substances added to food in order to retain or improve desirable characteristics or quality. In the last years many more additives have been introduced, of either natural or artificial origin. Many of which can be the cause of certain health conditions, such as E102 that can cause. Asthma attacks and has links to thyroid tumors, 122 can cause bad reactions in asthmatics and people allergic to aspirin (*Martin, 2007*).

Shafiquzzaman and Shaarani, (2016) reported that food dyes can be categorized into natural and synthetic color. Tartrazine (E102) which belong to the family of azo dyes and commonly used in food industry. Tartrazine imparts positive and negative benefits as well, by giving attractive physical appearance and consumer acceptance for over centuries. However, excessively intake of food Tartrazine can cause toxicity and pathogenicity to human. *Latifa et al., (2017)* showed that the current study aimed to evaluate the possible adverse effect of this coloring food additive on renal and hepatic structures and functions. Also, the genotoxic , the results showed that tartrazine intake may lead to adverse health effects. *Kamal and Fawzia ,(2018)* showed that Non-food products: Tartrazine

may be found in non-food products like soaps, cosmetics, shampoos and other hair products, conditioners, pastels, crayons and stamp dyes. Medications: particular medical preparations comprise tartrazine as antiacids, vitamins, certain prescription medications and medical capsules. Accruing research has been performed on tartrazine and its effect on the health.

(*Yamjala et al.,2016*) carmoisine as an improvement and attractive agent for clientage by making visually aesthetic or to reinstate the original appearance.(*Salama et al.,2016*) In recent years, food additives in general, and colors, in particular, have increasingly come under investigation for the evaluation of their safety in use .

Materials and Methods

This study was conducted on children of nurseries and primary schools, especially the first and second primary grades, and their ages ranged between 1-7 years, and this study began in August 2015 and ended in May 2021, and the target group was children from the age of 1 to 7 years in nurseries and primary schools in Damietta governorate.

1- A questionnaire about artificial color

This questionnaire in includes the period of artificial color In foods includes the nutritional history from the age of 1year to 7years and the number of times this food contains artificial colors monthly ,weekly and daily

And the number of daily eating times one or more times ,twice or more , three times and more as well as weekly and monthly, and never at all the purpose the questionnaire was to evaluate the indicator of the intake of artificial colors in baby (*appendix 1*)

2- Weight

Weight /age were recorded using abeam scale. Subjects were weighted To the nearest kilogram without shoes and in light clothes. The scale was calibrated before use. (*Jelliffe ,1966*)

3- Determination of food colorants using HPLC

Synthetic dyes of E 102 and E 122 were determined according to the method described by (*Laurian et al., 2014*) as follows: Synthetic dyes stock solutions were prepared in methanol at the concentrations of 1 mg/ml. While, working solutions were prepared by diluting specific volumes of stock solution with distilled water, yielding six standards with concentration ranged between 100 and 10000 ng/ml.

Jelly (2 g) was extracted using 20 ml methanol for 15 min under continuous stirring. Moreover, the obtained extract and other samples were degassed for 2 min in the ultrasonic bath, followed by filtration using syringe filter (0.22 µm). Then, the filtrate was diluted for specific volumes using distilled water.

The HPLC system (*Jasco, Japan*) with an UV detector was used for dye determination. For the separation, a reversed phase Agilent SB C18 analytical column, 250x4.5 mm, 5 µm particles was used (*Agilent Technologies, USA*) at 45 °C. The mobile phase consists in a mixture The HPLC system (*Jasco, Japan*) with an UV detector was used for dye determination. For the separation, a reversed phase Agilent SB C18 analytical column, 250x4.5 mm, 5 µm particles was used (*Agilent Technologies, USA*) at 45 °C. The mobile phase consists in a mixture of 100 mM ammonium acetate (A)/acetonitrile (B) gradient elution (beginning with 4% B, until 7 min 35% B, to 7.2 min 35% B, until 7.21 min 4 %B). The flow rate was 1 mL/min with injection volume of 20 µL. Additionally, E 102 and E 122 dyes were read at 420 and 520 nm, respectively

4- Chemical analysis hemoglobin of children:

Blood samples were taken from children from Kindergartens and primary schools in Damietta governorate 200samples from children 1to7 years old and the hemoglobin

Level was analyzed before eating (sweet children)foods added to it the industrial coloring(containing artificial colors, tartazine and carmoisine) and the proportion of hemoglobin after eating was analyzed the work of

analysis of the hemoglobin (Hb) described according to method (*Lee and Nieman, 1996*).

Results and Discussion

Food history

Data in table (1) and fig (1) showed that relative distribution of children in the research in items of consumption of baby (children) food according to the age group. Those children at the age of three years where it was found are the most consumed of food for children by percentage of 56.71% and then the percentage started to decline for the following age groups. The percentage of consumption of baby food in the second year of the age stage is 33.% and the percentage of consumption of baby food in the fourth year of the child's life stage is 12.95% As for the percentage of consumption of baby food in the fifth year of the child's life stage, 12.95%, and this percentage is repeated As for the percentage of consumption of baby food in the sixth year of the child's age stage, 4.85%, and the consumption rate in the seventh year of the child's age stage is 12.91%. *Elena, (2013)* reported that rapid growth and development occurs during the preschool years, ages 2 through 5. A child grows about 2 to 3 inches. Proper nutrition and opportunities to play and be physically active are critical to ensuring your child grows properly, learns to enjoy nutritious foods, and adopts healthy behaviors for maximum development and lifelong health.

Table (1): Relative distribution of children in the research in terms of consumption of baby (children) food according to the age group.

Child age	%	Ranked
Year	-	-
2 years	0.33%	6
3 years	56.71%	1
4 years	12.95%	2
5 years	12.95%	2 Rep.
6 years	4.85%	5
7 years	12.91%	4

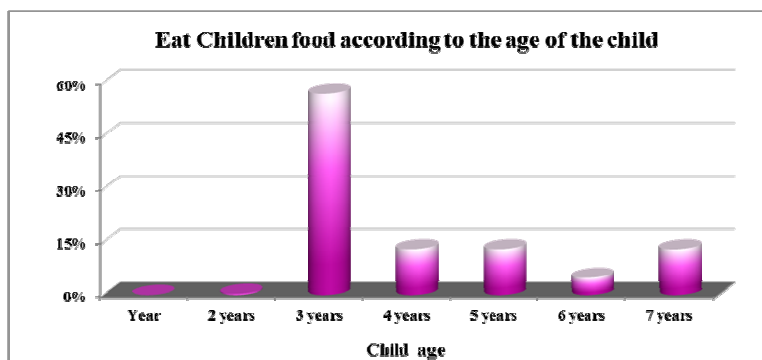


Fig (1) *Relative distribution of children in the research, in terms of the consumption of baby (children) food according to age group.*

Data in table (2) shown that and Fig(2) *relative distribution of children in the research sample in terms of the number of baking meals .* The cultivar TETE came stuffed with cream and Jelly with the flavor of Strawberries most eaten daily by (79.5%). Followed by HOHOS by (69.5%).

Then come TETE with cream and lemon flavor by (66.9%) and orange by (66.5%). The HOHOS Chocolate cake by (63.2%) and then the rest of the baked goods come according the percentage Fig (2) illustrates

In terms of the number of times you eat baked foods daily, more than once a day and a week, more than once a week, monthly and absolutely.

These results are in agreement with those reported by *Batada and Jacobson., (2016)* showed that artificial food colors (AFCs) in foods and beverages may be harmful to children. This study assesses the percentage of grocery store products marketed to children that contain AFCs, by category and company. -. (43.2% contained AFCs. The most common AFCs were Red 40 (29.8% of products), Blue 1 (24.2%), Yellow 5 (20.5%), and Yellow 6 (19.5%). Produce was the only category that did not have any AFCs. The highest percentage of products with AFCs was found in candies (96.3%), fruit-flavored snacks (94%), and drink mixes/powders (89.7%). Forty-one of the 66 companies marketed products containing AFCs. Given concerns about health effects of AFCs and high proportions of high-AFC categories,

clinicians, parents, food companies, and the government can take steps to support children's healthy eating and development by reducing AFCs in children's diets.

Table (2) : Relative distribution of children in the research sample in terms of the number of baking meals .

Group	Item	Eating children's foods												Percent	Ranked
		Daily		More than once a day		Weekly		More than once a week		Monthly		I don't eat at all			
		Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%		
Baked goods	TETE strawberry	128	64.0%	51	25.5%	3	1.5%	4	2.0%	10	5.0%	4	2.0%	79.5%	1
	TETE orange	89	44.5%	37	18.5%	13	6.5%	25	12.5%	23	11.5%	13	6.5%	66.5%	4
	TETE Lemon	63	31.5%	45	22.5%	18	9.0%	46	23.0%	18	9.0%	10	5.0%	66.9%	3
	HOHOS	101	50.5%	37	18.5%	16	8.0%	19	9.5%	17	8.5%	10	5.0%	69.5%	2
	HOHOS COKe	45	22.5%	51	25.5%	32	16.0%	36	18.0%	25	12.5%	11	5.5%	63.2%	5
	F16	63	31.5%	31	15.5%	21	10.5%	33	16.5%	35	17.5%	17	8.5%	58.3%	11
	TODO strawberry	66	33.0%	33	16.5%	26	13.0%	42	21.0%	17	8.5%	16	8.0%	62.4%	7
	TODO	75	37.5%	27	13.5%	31	15.5%	36	18.0%	26	13.0%	5	2.5%	63.1%	6
	PURa of strawberry	76	38.0%	13	6.5%	23	11.5%	56	28.0%	18	9.0%	14	7.0%	60.1%	9
	TODO	81	40.5%	9	4.5%	19	9.5%	56	28.0%	21	10.5%	14	7.0%	59.6%	10
Cute taste of scalp	60	30.0%	32	16.0%	34	17.0%	40	20.0%	19	9.5%	15	7.5%	60.7%	8	
nt (%)		38.50%		16.64%		10.73%		17.86%		10.41%		5.86%			

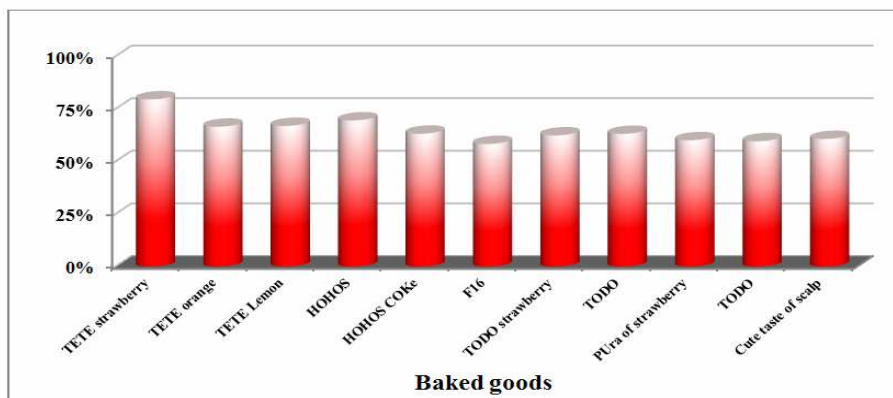


Fig (2) : Relative distribution of children in the research Sample ,in terms of the number of times to eat baked goods.

Data in table 3 and illustrated graphically in Fig (3) showed that relative distribution of children in the research sample, in terms of the number of times to eat Sweets . The item Marbella come the most eaten daily by (78.3%) .Followed by Marbella a core by (75.6%) Then orange lollipop by (72%).Then come Alwan core gum by (70.2%).and then the rest of Sweets come according to the percentage.

These results are in agreement with those reported by *Ghoreishi et al.,(2012)*. Showed that Synthetic colorants are also widely used for coloration of food not only to improve appearance and color but also to maintain the natural color during processing or storage

Table (3) : Relative distribution of children in the research sample ,in terms of the number of times to eat sweets .

Group	Item	Eating children's foods												Percent	Ranked
		Daily		More than once a day		Weekly		More than once a week		Monthly		I don't eat at all			
		Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%		
Candy	Marbella	49	24.5%	97	48.5%	21	10.5%	18	9.0%	6	3.0%	9	4.5%	78.3%	1
	Marbella kore	56	28.0%	86	43.0%	13	6.5%	24	12.0%	4	2.0%	17	8.5%	75.6%	2
	POP	82	41.0%	45	22.5%	16	8.0%	26	13.0%	13	6.5%	18	9.0%	67.6%	7
	Minino Red	59	29.5%	48	24.0%	29	14.5%	30	15.0%	13	6.5%	21	10.5%	63.7%	12
	Minino green	74	37.0%	49	24.5%	14	7.0%	29	14.5%	11	5.5%	23	11.5%	66.7%	8
	PiERPOT	37	18.5%	49	24.5%	27	13.5%	37	18.5%	11	5.5%	39	19.5%	56.9%	15
	Maxi apple	36	18.0%	48	24.0%	37	18.5%	35	17.5%	12	6.0%	32	16.0%	57.5%	14
	Caramel of Basetti	78	39.0%	34	17.0%	31	15.5%	28	14.0%	16	8.0%	13	6.5%	64.4%	10
	Mickey and Anos lollipop	97	48.5%	41	20.5%	17	8.5%	14	7.0%	17	8.5%	14	7.0%	68.6%	6
	Mickey and Anos sweets	71	35.5%	28	14.0%	29	14.5%	35	17.5%	10	5.0%	27	13.5%	59.7%	13
	Orange lollipop	86	43.0%	50	25.0%	18	9.0%	26	13.0%	12	6.0%	8	4.0%	72.0%	3
	Lemon sucker	97	48.5%	17	8.5%	21	10.5%	36	18.0%	18	9.0%	11	5.5%	64.1%	11
	SONa POP	127	63.5%	9	4.5%	15	7.5%	21	10.5%	16	8.0%	22	11.0%	66.2%	9
	Laban Alwan Core	91	45.5%	52	26.0%	25	12.5%	9	4.5%	15	7.5%	8	4.0%	71.6%	4
	Jelly straw.	87	43.5%	47	23.5%	26	13.0%	18	9.0%	13	6.5%	9	4.5%	70.2%	5
Juicy Cola	33	16.5%	3	1.5%	17	8.5%	11	5.5%	15	7.5%	121	60.5%	22.9%	16	
Percent (%)		36.25%		21.97%		11.13%		12.41%		6.31%		12.25%			

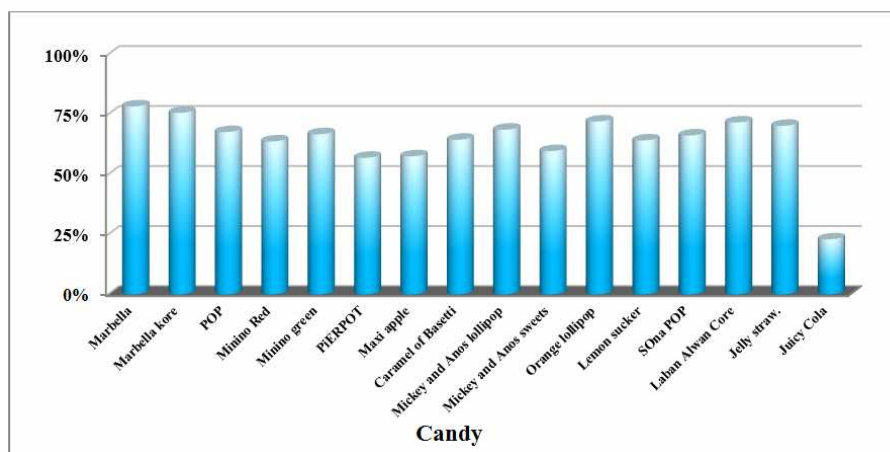


Fig (3) Relative distribution of children in the research Sample, in terms of the number of times to eat Sweets

Data in Table (4) and Fig(4) showed that relative distribution of children in the research sample in terms of the number of times to eat ice – cream and Jelly.

Relative distribution of children in the research sample in terms of the number of times to eat ice –cream and Jelly. Relative distribution of children in the research sample in terms of the number of times to eat ice – cream and Jelly. The variety of Viola water melon came in the most daily intake by (77.3%) Followed by orange Jelly by (76.8%) Then Strawberries Jelly by (71.3%). These results are in agreement with those reported by *Asfaq and Masud, (2002)* showed that according the data published in many countries it is showed that food intoxications are increasing. They are observed that colored food products are the major source for food intoxication. Adding attractive colors can enhance the appetizing value of foods and beverages. Therefore most food manufacturers use many colors in their products including confectioneries, fruit drinks, soft drinks, jams and jellies, etc.

Table (4):Relative distribution of children in the research sample in terms of the number of times to eat ice-cream and Jelly.

Group	Item	Eating children's foods												Percent	Ranked
		Daily		More than once a day		Weekly		More than once a week		Monthly		I don't eat at all			
		Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%		
Ice cream and jelly	Ice cream MAgA	46	23.0%	45	22.5%	24	12.0%	40	20.0%	29	14.5%	16	8.0%	60.6%	12
	Chocolate Mega Ice Cream	108	54.0%	27	13.5%	16	8.0%	22	11.0%	15	7.5%	12	6.0%	68.0%	5
	Mango Ice Cream	110	55.0%	28	14.0%	13	6.5%	28	14.0%	9	4.5%	12	6.0%	69.9%	4
	Keima Okono	99	49.5%	29	14.5%	16	8.0%	30	15.0%	13	6.5%	13	6.5%	67.6%	6
	Chocolate Ice Cream	40	20.0%	52	26.0%	32	16.0%	24	12.0%	38	19.0%	14	7.0%	59.4%	13
	Granita Ice Cream	90	45.0%	41	20.5%	24	12.0%	6	3.0%	16	8.0%	23	11.5%	64.7%	9
	Super kima	42	21.0%	49	24.5%	25	12.5%	43	21.5%	30	15.0%	11	5.5%	62.2%	11
	Kimo Robio	56	28.0%	46	23.0%	20	10.0%	36	18.0%	32	16.0%	10	5.0%	63.4%	10
	Kimo-conwalk vanilla	101	50.5%	24	12.0%	22	11.0%	28	14.0%	20	10.0%	5	2.5%	67.2%	7
	Dolesica Ice Cream	44	22.0%	43	21.5%	29	14.5%	23	11.5%	49	24.5%	12	6.0%	56.7%	14
	Viola ice cream	149	74.5%	26	13.0%	6	3.0%	10	5.0%	5	2.5%	4	2.0%	77.3%	1
	Dala Ice Cream	67	33.5%	32	16.0%	14	7.0%	16	8.0%	50	25.0%	21	10.5%	55.4%	15
	Kimo kono, vanilla and chocolate	58	29.0%	52	26.0%	21	10.5%	35	17.5%	25	12.5%	9	4.5%	66.4%	8
	Chinese ice cream	53	26.5%	36	18.0%	20	10.0%	17	8.5%	58	29.0%	16	8.0%	54.1%	17
	Shenboa Ice Cream	36	18.0%	46	23.0%	34	17.0%	19	9.5%	46	23.0%	19	9.5%	54.5%	16
	Jelly with orange	152	76.0%	22	11.0%	5	2.5%	11	5.5%	7	3.5%	3	1.5%	76.8%	2
Strawberry jelly	128	64.0%	20	10.0%	14	7.0%	19	9.5%	15	7.5%	4	2.0%	71.2%	3	
Percent (%)		40.56%		18.18%		9.85%		11.97%		13.44%		6.00%			

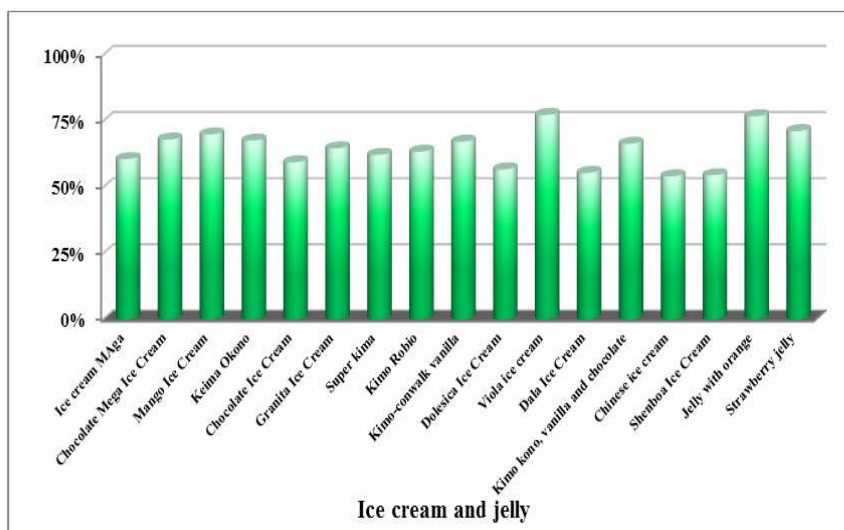


Fig (4) Relative distribution of children in the research

Sample in terms of the number of the times to eat ice –cream and Jelly

Data in Table 5 and Fig (5) showed that relative distribution of children for research sample in terms of the number of times.

A set juices and drinks

The results showed in Table (5) and Fig (5) Fruit Juice, and found that the percentage of consumed daily is 32%, the rate of consuming it more than once a day is 9.5%, the rate of consuming it more than once a day is 14.5%, the rate of consuming it more than once a week is 26%, the rate of consuming it more than once a week, and the rate of consumption 9% Never 9%.

Table(5): Shows The relative distribution of children for the research sample in terms of the number Of times consuming Juices and drinks.

Group	Item	Eating children's foods												Percent	Ranked
		Daily		More than once a day		Weekly		More than once a week		Monthly		I don't eat at all			
		Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%		
Juices and drinks	fruit juice	64	32.0%	19	9.5%	29	14.5%	52	26.0%	18	9.0%	18	9.0%	58.3%	4
	Fanta green apple	68	34.0%	25	12.5%	24	12.0%	50	25.0%	20	10.0%	13	6.5%	61.5%	3
	Strawberry	63	31.5%	28	14.0%	28	14.0%	40	20.0%	15	7.5%	26	13.0%	58.3%	Rep. 4
	Loleta	93	46.5%	42	21.0%	22	11.0%	12	6.0%	18	9.0%	13	6.5%	68.0%	1
	UOGO	87	43.5%	41	20.5%	25	12.5%	18	9.0%	8	4.0%	21	10.5%	66.5%	2
Percent (%)		37.50%		15.50%		12.80%		17.20%		7.90%		9.10%			

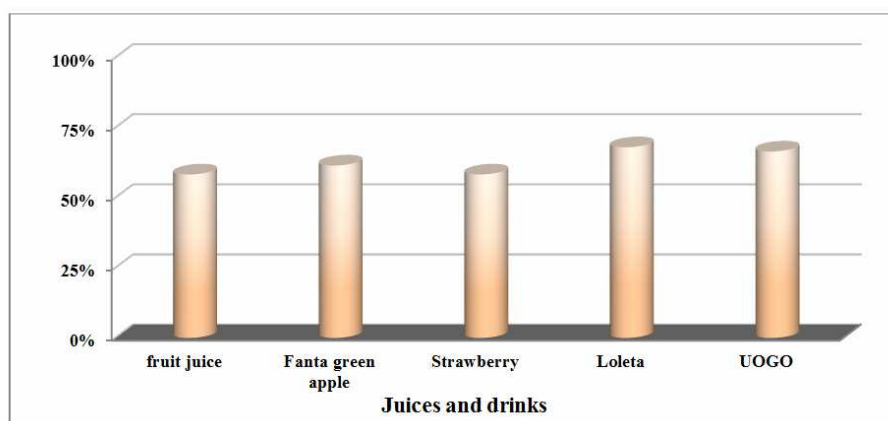


Fig (5) The relative distribution of children for the research Sample in terms of the number of times consuming Juices and drinks.

Data in Table (6) and Fig (6) and Fig (7) showed that relative distribution of children for the research sample in Terms of the number of times children eat foods.

In the present study it was noticed that The percentage of consuming the first group, which is Baked goods daily, is 38.50%, the rate of consuming more than once a day is 16.64%, the rate of consuming it more than once a day is 10.73%, the rate of consuming it more than once in a week is 17.86%, the rate of consuming it more than once in a week is 17.86%, the rate of eating it more than once a week is 10.41% and the rate of consuming it absolutely 5.86%

The percentage of consuming the third group, which is Ice cream daily and jelly, is 40.56%, the rate of consuming more than once a day is 18.18%, the rate of consuming it more than once a week is 9.85%, the rate of consuming it more than once a week is 11.97%, the rate of consuming it more than once in a week is 11.97%, the rate of consuming it more than once a week is 13.44%, and the percentage of eating it at all 6%.

The percentage of consuming the fourth group, which is Juices and drinks daily, is 37.50% the rate of consuming more than once a day is 15.50% the rate of consuming it more than once a week is 12.80% the rate of consuming it more than once a week is 11.97%, the rate of consuming it more than once in a week.17.20% the rate of consuming it more than once a week is 7.90% and the percentage of eating it at all 9.10%

The most delicious baked items came daily with a relative weight 64.53%

Weight followed by a set of ice cream and Jelly with a relative 64.44% then a candy group with a relative weight 64.13%

And finally a group of Juices and drinks with a relative weight 62.52%

Table (6): Shows the relative distribution of children for the research sample in Terms of the number of times children eat foods.

Group	Eating children's foods						(%)	Ranked
	Daily	More than once a day	Weekly	More than once a week	Monthly	I don't eat at all		
Baked goods	38.50%	16.64%	10.73%	17.86%	10.41%	5.86%	64.53%	1
Candy	36.25%	21.97%	11.13%	12.41%	6.31%	12.25%	64.13%	3
Ice cream and jelly	40.56%	18.18%	9.85%	11.97%	13.44%	6.00%	64.44%	2
Juices and drinks	37.50%	15.50%	12.80%	17.20%	7.90%	9.10%	62.52%	4

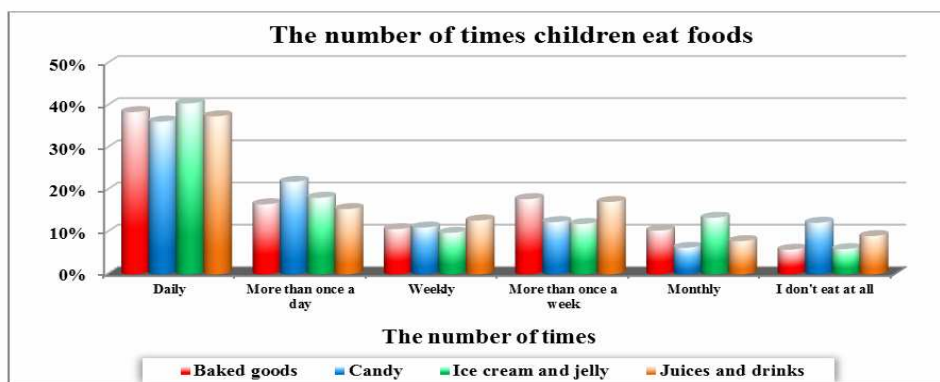


Fig (6) : *The relative distribution of children for the research Sample in terms of the number of times children eat foods*

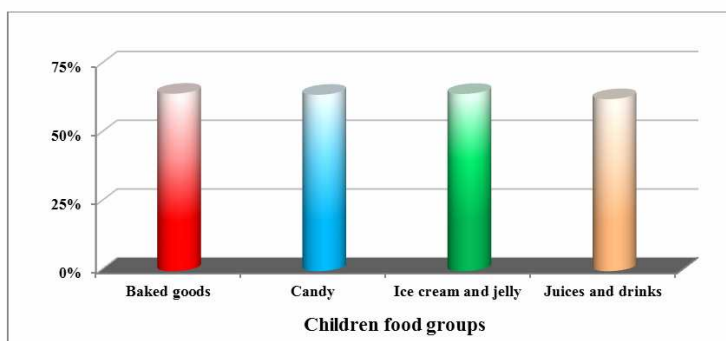


Fig (7) : weight distribution of children for the research Sample in terms of the times eat group children foods .

Results of tatrazine analysis (E 102)

Results of E 102 analysis using supercritical HPLC (Jasco)

Data in Table (7) showed that the results of analysis for the concentrations of tatrazine (E102) in the foods that the children ate

From Table (7) it becomes clear that the average concentration of tartarazine (E 102) in the foods that the children ate (the research sample) was less than the international permissible (7.5 mg per kilogram of the human body)

This disagreed with the study of *pratima and sudershan, (2008)* the present study was an attempt to assess the risk of selected population to synthetic food colors. Children had high intakes of cultured solid (25? 465 g day⁻¹) and liquid foods (25? 840 ml day⁻¹). The study showed the predominant consumption of two colors such as tartrazine and sunset yellow mainly from sweetmeats, beverages and fast foods. The intakes of colors like tartrazine, erythrosine and sunset yellow were high among children due to ingestion of foods containing high concentrations of colors (9.45 and 4.0 mg). The study emphasized the need to evaluate the risk of the population to colors on a long-term basis. Also this disagreed with the study of *Sharma et al ., (2009)* showed that the Tartrazine is a water soluble synthetic lemon-

yellow azo dye used as a food colorant with an acceptable daily intake (ADI) of 0-7.5mg/kg body weight

Also this disagreed with the study of *Zigmas* , (2016)stated that tartrazine is a synthetic orange powder or granules soluble in water, consisting of a minimum of 85 % "total coloring matters content" calculated as sodium salt. Tartrazine in feeding stuffs and water. Therefore the EURL cannot evaluate nor recommend any method for official control to determine Tartrazine in feeding stuffs and water

Table (7): shows the results of the analysis for the concentrations of tatarzine (E 102) in the foods that the children ate (the research sample).

sample	Package Weight (g)	Average daily intake (g)	Average daily intake (g)	The concentration of the substance (E 102) in the package	Focus on the material covered	Average weight of children (kg)	Concentration rate (mg / kg bw)
loleta	40	15.45	20.60	33.59	692	14.15	0.05
U Go	350	7.08	82.60	13.21	1091		0.08
Jelly straw.	75	3.97	9.93	14.71	1.46		0.10
maxi apple	350	4.15	48.42	19.23	931		0.07
jelly orange	75	6.28	15.70	17.02	2.67		0.19

Results of E 122 analysis using supercritical HPLC (Jasco)

From Table (8) it becomes clear that the average concentration of carmosine (E 122) in the foods that the children ate (the research sample) was less than the international permissible (4 milligrams per kilogram of the human body). From Table (8) it becomes clear that the average concentration of carmosine (E 122) in the foods that the children ate (the research sample) was less than the international permissible (4 milligrams per kilogram of the human body).

This disagreed with the study of (*Karen et al., 2006; Martin, 2007*)

Also, Synthetic food additive colors have been introduced in our food in order to give attractive colors to it. It has been noticed, however, that most of the applied synthetic food colors have properties similar to the

Synthetic food colors have properties similar to the mutagenic chemicals. Evidences have accumulated in the last years to indicate that a large number of synthetic food additives are capable of inducing genetic diseases to human.

sample	Package Weight (g)	Average Intake (during the period) (Package)	Average daily intake (g)	The concentration of the substance (E 102) in the package	Focus on the material covered	Average weight of children (kg)	Concentration rate (mg / kg bw)
loleta	40	18.2	24.27	32.93	799.10	14.26	0.06
Jelly	15	16.04	8.02	5.2	0.42		0.03

Data presented in Table (9) figure (8) and figure(9) shows the level averages and standard deviations of hemoglobin level Before and after eating children's food.

The table showed the table showed that there was an increase in the rate of the shows the level averages and standard deviations of hemoglobin level before and after eating children's food

Results also showed that there was an increase in the rate of the hemoglobin Improvement rate after taking twice (-7.11%) Improvement rate after taking three times (-13.70%)

The rate of improvement after eating more than three times (-13.64%)

Table (9) :The level averages and standard deviations of hemoglobin level Before and after eating children's food.

Count times eating	Hemoglobin level				
	Before eating		After eating		Improvement (%) ratio
	Mean	SD	Mean	SD	
Twice a day	9.74	0.82	9.05	0.88	-7.11%
Three times a day	9.23	1.26	7.97	1.27	-13.70%
More than three times	8.78	1.22	7.58	1.08	-13.64%

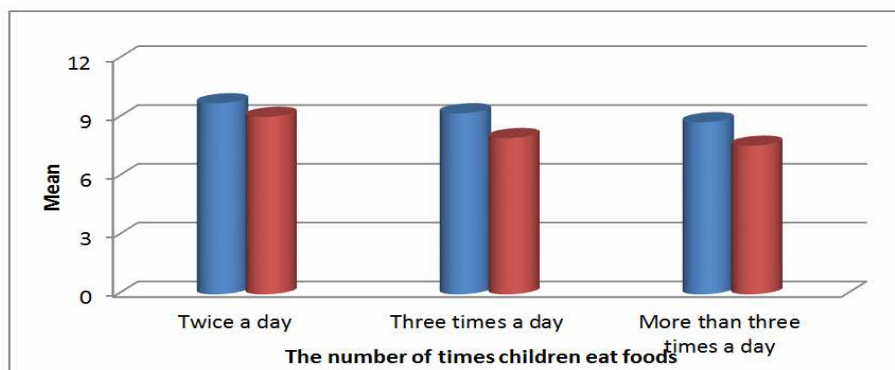


Fig (8) *the percentage of improvement in the level of Hemoglobin before and after eating children's foods .*

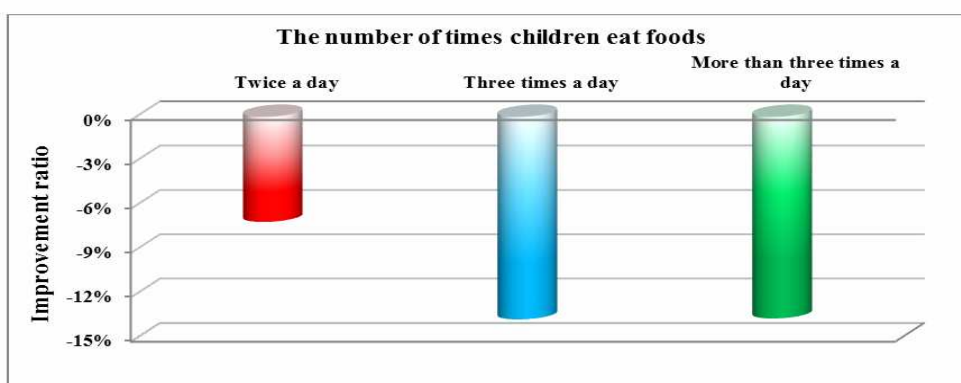


Fig (9) *: the percentage of improvement in the level of Hemoglobin before and after eating children's foods.*

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الدراسة المسحية للألوان الاصطناعية المضافة لبعض أطعمة الأطفال المتناولة في محافظة دمياط

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الملخص العربي

الغذاء ضروري لنمو الأطفال وتطورهم بشكل صحيح ، والاستهلاك المفرط للألوان الاصطناعية في أغذية الأطفال هو مشكلة صحية خطيرة لها تأثير سلبي على نمو الأطفال وصحتهم. الهدف من هذه الدراسة هو تقييم مسح للألوان الصناعية في أغذية الأطفال بمحافظة دمياط لدى الأطفال الذين تتراوح أعمارهم بين ١ و ٧ سنوات وتأثيرها على الصحة العامة للطفل وخاصة فقر الدم عند الأطفال. شملت الدراسة ٢٠٠ طفل من حضانات ومدارس ابتدائية بمحافظة دمياط و قمنا بمسح أطعمة الأطفال المحتوية على الألوان الاصطناعية في السوبر ماركت لتحديد الألوان الصناعية ، وخاصة اللون الصناعي التاترازين (E 102) واللون الصناعي الكارموزين (E122). أغذية الأطفال مثل الجيلي والمشروبات الغازية واللؤلؤة وحلوى الأطفال. قمنا بتحليل تركيزات اللون الاصطناعي التاترازين (E102) اللون الصناعي الكارموزين (E122) في أغذية الأطفال في كروماتوجرافيا HPLC. قمنا بتحليل فقر الدم قبل إعطاء الأطفال الألوان الاصطناعية في حلويات الأطفال. ثم قمنا بتحليلها بعد إعطاء الأطفال حلويات تحتوي على ألوان صناعية.

أظهرت النتائج أن الأطفال في سن ثلاث سنوات تناولوا المزيد من أغذية الأطفال المحتوية على ألوان صناعية أكثر الأطعمة استهلاكاً للأطفال بنسبة (٥٦,٧١٪) ثم بدأت النسبة في الانخفاض للفئات العمرية التالية. بلغت نسبة استهلاك أغذية الأطفال في السنة الثانية من المرحلة العمرية (٣٣٪) ونسبة استهلاك أغذية الأطفال في السنة الرابعة من عمر الطفل فهي (١٢,٩٥٪). وبلغت نسبة استهلاك أغذية الأطفال في السنة الخامسة من عمر الطفل (٤,٨٥٪) ومعدل الاستهلاك في السنة السابعة من مرحلة عمر الطفل (١٢,٩١٪).

أظهرت النتائج أن نسبة تناول حلويات الأطفال في عينات مختلفة من التاترازين (E102) التي تم تحليلها على جهاز Hplc كانت أقل من المسموح به دولياً ، حيث وجد أن نسبة ١٠٠ مجم لوليتا هي النسبة المثوية لتركيز مادة التاترازين حوالي ٣٣,٥٩ ميكروغرام ونسبة ١٠٠ مجم من المياه الغازية ماكسي تفاح حوالي ١٩,٢٣ ميكروغرام / وبالمثل ، وجيلي الفراولة نسبة التركيز حوالي ١٤,٧١ مجم ، نسبة التركيز في المياه الغازية UGO هو ١٣,٢١ ميكروغرام ، ونسبة التركيز في جيلي

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البرتقال ١٧.٠٢ مجم. يتضح أن متوسط تركيز التارترازين (E 102) في الأطعمة التي أكلها الأطفال (عينة البحث) كان أقل من المسموح به دولياً (٧.٥ مجم لكل كيلوجرام من جسم الإنسان).

أظهرت نتائج الكارموزين أنه أقل من الحدود المسموح بها .

يتضح أن متوسط تركيز الكارموزين (E 122) في الأطعمة التي أكلها الأطفال (عينة البحث) كان أقل من المسموح به دولياً (٤ ملليغرام لكل كيلوجرام من جسم الإنسان).

أظهرت النتائج وجود تأثير معنوي لعدد مرات تناول الطعام على مستويات الهيموجلوبين بعد تناول طعام الأطفال ، حيث بلغت قيمة ف " (٢٨.٣١٪) P ومستوى الدلالة (٠.٠٠١).

مما يدل على وجود فروق ذات دلالة احصائية بين عدد المتناول وهذا أدى الى ارتفاع نسبة فقر الدم بين اطفال عينة البحث بعد تناول طعام الاطفال.

إلا أن الأبحاث السابقة ما زالت تثبت أن التارترازين صبغة سامة ، وهذه الدراسة أظهرت عدم وجود تأثير ضار للتارترازين والكارموزين على فقر الدم لدى الأطفال ، وتم قياسه بإجراء اختبار فقر الدم للأطفال ، والنتائج تؤكد ذلك.

الكلمات المفتاحية : ألوان اصطناعية. التارترازين. الكارموزين. فقر دم