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NUTRITIONAL AND MICROBIOLOGICAL EVALUATION OF SOME TRADITIONAL FOODS

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ABSTRACT: The present study was carried out to evaluate the nutritional value and microbiological analysis of some traditional Egyptian dishes. Medammis, Taamia and Koshery samples were collected from two different sites from local shops in Zagazig city, El-Sharkia , Egypt . Also, the same dishes were prepared and cooking under laboratory conditions according to the Egyptian home style. Protein and total carbohydrate were represented a major component of all dishes which ranged from 17.02 to 25.43% and 60.48 % to 68.56% (on dry weight), respectively for medammis, 14.30 to 22.05% and 49.56 to 57.39% respectively for taamia and from 13.12 to 16.78% and 76.43 to 77.22% for koshery samples . Medammis taamia and koshery samples were served to fulfill about 73, 62 and 2.1% respectively of the adult man daily requirement for iron . Total essential amino acid (EAA) and non essential amino acids (NEAA) were ranged from 36.60 to 38.69% and 59.44 to 61.91% respectively for medammis samples and 38.9 to 40.55% and 59.48 to 61.91% respectively for taamia and 37.39 to 39.19% and 60.81 to 62.61%, respectively for koshery samples. Essential amino acid scores in relation to FAO/WHO (1973) indicated a deficiency of sulfur containing amino acid in medammis and taamia samples while in koshery samples were lysine. Microbiological analysis showed that medammis and koshery samples which collected from the local shops were highly loaded with total bacteria count, *E. coli and S. aureus*. This reflects poor sanitary conditions or absence of personal hygienic conditions in the preparation and handling of these traditional foods.

Key words : Medammis , taamia , koshery, essential amino acids, non essential amino acids, total bacteria count , *E. coli* and *S. aureus* .

INTRODUCTION

Food consumption habits of people in any part of the world are related to several factors such as agro- ecological conditions, socio – cultural factors, and religions (Raghavendra Rao *et al.* 1988). Moreover , the changes that may be observed in food consumption pattern in any country can be attributed to many factors included change in the income, fluctuation in food prices, food policy, influence of mass madia and charging the structure of house holds (Musaigor , 1991). Methods of preparing traditional foods are generally sample and less expensive but the product may suffer from poor quality and low nutritional value since the old methods have passed through the ages without much modification (Koleosa , 1989), therefore , the need to educate people on improved methods of preparing processing and preservation of traditional food product were recommended and the modern technologies still needed (Lee, 1989). Depending on the type of raw materials, food consumption habits and methods of processing, each country has specific and characteristics varieties of traditional foods (Kuhnlim, 1989). Basaran (1999) described ingredients methods of preparation and proximate composition in traditional food consumed in Middle Eastern countries.

In Egypt, variation in traditional food products is so fast that it is difficult to treat them as a single class of food. Examples of these Egyptian traditional foods are medammis, taamia, koshery , nabet , kesk and solted fishes. The traditional method for preparing medammis is simmering the broad bean over night (about 12 hr) with low heat. Taamia is made from dehulled faba bean seeds which are soaked in water for 12hr drained , than ground with a mixture of flavoring condiments to prepare paste which divided to small patties followed by frying in hot oil, koshery dish is a mixture of pre-cooked macaroni, rice and lentil in addition to small quantities of fried onion and other flavoring materials .

The obsessive of the present work is to evaluate the nutritional value and microbiology examinations of three major traditional dishes which collected from two shops in the local market of Zagazig city, El-Sharkia, Egypt.

MATERIALS AND METHODS

Two samples of stewed faba bean (Medammis), taamia, and koshery were collected in the two different sites from local shops in

Zagazig city, El-Sharkia Egypt. All samples were taken to the laboratory in sterile plastic bag and directly analyzed for microbiological test with on hour after reaching the laboratory. The remaining samples were packed in glass bottles and kept at low temp. (-18°C) for chemical analysis. Also, the same samples were prepared an cooked in the laboratory according to the Egyptian home.

Chemical analysis

Moisture, protein, fat, ash and crude fiber were determined according to AOAC (1990) while total carbohydrate was calculated by the differences weight. Energy value was calculated by multiplying carbohydrate and protein content by 4 and fat content by 9 according to the method described by Hawk *et al.* (1949).

Calcium, magnesium and iron were determined according to the method reported by Gorsuch (1959) using Atomic Absorption apparatus (Perkin Elmer Model 2380). Phosphorus content was determined according to AOAC (1990).

Amino acid determination

Individual amino acids were determined according to Landoult and Guiochen (1964) modified by Afifi *et al.* (1994) using Gas–liquid chromatography (type variah 3700 column 225). Amino acid scores were calculated in relation to FAO/WHO (1973) reference protein to indicate the limiting amino acid tryptophan was determined according to the method described by AOAC (1990).

Microbiology examination:

Total bacteria count and coliform bacteria were determined according to Awad *et al.* (1993) and Thatcher & Clark 1978 respectively. *E. coli and S. aureus* were determined according to the method described by Oxoid Manual (1982).

RESULTS AND DISCUSSION

Chemical composition of medammis

Medammis are a popular dish in Egypt. Results given in Table (1) show chemical composition of medammis samples which prepared under laboratory conditions and the two samples collected from the two different sites of local shops. The moisture content was about 70.04%, protein and total carbohydrates were constituted the higher content of all samples which ranged from 17.02 to 25.43% and 60.48 to 68.56% respectively. A slight changes were found between

samples regarding the ash, fat and fiber content which ranged from 3.73 to 4.92%, 1.94 to 2.23% and 7.28 to 9.67%, respectively .

Results also showed that total calories which could be obtained by consuming 100 g of medammis were about 108.01 kcal (on wet weight). These results are in agreements with those obtained by Khalil and Mansour (1995).

Chemical composition of taamia

Taamia is the most popular and more famous product of all classis of Egyptian people. Results given in table (2) show the proximate composition of taamia samples. Moisture content was 22.68, 30.0 and 32% for taamia was prepared under laboratory conditions and the two samples which collected in the two different sites in the local shops. Taamia prepared under laboratory conditions showed a higher content of protein and total carbohydrate and a lower content of fat and ash. These variations may be attributed to the raw materials i.e broad beans and flavoring green mixture used in the preparation as well as the difference in the procedure applied during seeds dehulling, soaking, grinding and frying operation between laboratory and taamia shops .

Results also showed that total calories which could be obtained by consuming 100 g of fried taamia was about 302.9 kcal These results are in agreements with Hassan *et al.* (1991) and Al-kahalifah (1993).

Chemical composition of koshary

Koshary is one of the most popular products for all people in Egypt. Results in Table (3) show chemical composition of koshary samples. Koshary which prepared under laboratory conditions was the highest content of moisture and protein, while fat was a lower content. There variation may be attributed to the different type and amount of ingredient, different preparation methods or cooking methods. Carbohydrate content was represented the major component in koshary samples, it was about 76.82% (on dry weight). A slight difference was found in fat, ash and fiber content in all samples. The caloric value which could be obtained by consuming 100 g of koshary was about 145.85 kcal (on wet weight). The same findings have been reported by Khalil *et al.*, 1999 .

Mineral contents of some traditional dishes

Mineral composition of medammis samples are given in

Table (4). The results show that iron, magnesium phosphorous and calcium were ranged from 5.8 to 9.09, 138 to 151.6 , 334.5 to 340.6 and 48.84 to 50.27 mg/ 100 g respectively in medammis samples. It could be noticed that medammis sample 1 which prepared under laboratory conditions was the highest content of all minerals while sample 3 which collected from the local shop was the lowest content of iron. The difference in all values may be due to the different varieties of faba bean used or to cooking methods, type of heating and time of cooking and other ingredients which added to the dish. Medammis meal of 100 g served to fulfil about 73, 42 and 6.6% of the adult man daily requirements according to Wilson *et al.* (1979) from iron, phosphorus and calcium. These results are in agreements with Youssef (1990).

Results in the same Table (4) show that iron, magnesium, phosphorous and calcium content in all taamia samples were ranged from 5.114 to 7.19, 137.3 to 1424, 289 to 313.4 and 51.5 to 665 mg/100 g respectively. It could be observed that sample 1 which prepared under laboratory conditions was the highest content in all minerals which samples 3 which collected from the local shop was the lowest content of all minerals. Hundred gram of taamia meal covered about 62, 38 and 7.4 % of the adult man daily requirements iron of phosphorous and calcium respectively. These results are in agreements with Khalil *et al.* (2001).

Results also show that phosphorous was the predominate mineral in koshary samples with the concentration of 280, 225 and 217 mg/100 g of sample 1, 2 and 3 respectively. Koshory samples contained a lesser amount of iron and calcium koshory meal of 100 g served to fulfill about 2.1, 30 and 2.1% of adult man daily requirements for iron, phosphorus and calcium respectively. The decrease of mineral elements in koshary dish samples may be as a result of leaching it out during cooking and discarding of cooking water. These results are in agreements with Shekib *et al.* (1985).

Amino acid composition of medammis

Results given in Table (5) show amino acid content of medammis samples which prepared under laboratory conditions and the two samples collected from the two different site of local market. Amino acid expressed as g amino acid to 100 g

protein and the essential amino acid (EAA) of FAO / WHO (1973) reference proteins pattern were also included for comparison. Results show that total EAA and non essential amino acid (NEAA) ranged from 36.65 to 38.69 and 59.44 to 61.91% respectively. Leucine was predominated with concentration 7.5, 7.65 and 7.8%, followed by lysine (6.5, 6.22 and 6.62%) in EAA for sample 1,2 and 3 respectively. Sulfur containing amino acid was the lowest content of EAA. Glutamic acid was the highest content of NEAA (with mean value 15.88%), followed by aspartic acid (with mean value 8.95%). Histidine was the lowest content of NEAA.

Amino acid scores (As)

To find out the nutritional values of the three samples of medammis. As of EAA were estimated in relation to FAO/WHO (1973) and FAO/ WHO/UNU (1985) reference pattern amino acid and the results obtained are presented in Table (6). In relation to FAO/WHO (1973) Medammis samples were deficient in sulfur containing amino acid, valine and isoleucine. Bakr and Bayomy (1997) found that heat treatment markedly of faba bean decreased some essential amino acid especially phenylalanine cysteine and methionine and tryptophane. According to FAO / WHO / UNU (1985). Medammis samples showed no deficiency in all essential amino acid. Similar observations were found by Youssef (1990).

Amino acid composition of taamia

Amino acid composition of taamia samples which prepared under laboratory conditions and collected from two different sites of local shops are presented in table (7). Data showed that total essential amino acid (EAA) was 40.55, 40 and 38.9% and total non essential amino acid was 59.48, 59.75 and 61.91 g/100 for taamia sample 1, 2 and 3 respectively. The predominant EAA of all samples were leucine, lysine and valine which represented about 20, 17 and 13 % respectively. The predominant NEAA were glutomic acid aspertic acid and argeinine which represented about 26, 20 and 9% respectively. The lowest content of EAA and NEAA was sulfur containing amino acid and histidine respectively. There results are agreed with Damir *et al.* (1985).

Amino acid scores (As)

To determined the biological values of taamia protein, As for the EAA in taamia samples were estimated relation to FAO/WHO

(1973) and FAO/WHO/ UNU (1985) protein references and data obtained are given in table (8). In relation to FAO/WHO (1973), taamia samples were deficient in sulfur containing amino acid.

According to FAO / WHO / UNU (1985) taamia samples showed no deficiency in all EAA. These results are agreements with Khalil *et al.* (2001).

Amino acid composition of koshary samples

The quality of protein depends on factor like composition of amino acid, biological values and digestibility. Lentil seeds are rich in lysine but show deficiency in sulfur containing amino acid. In contrast to this rice protein has better amounts of sulfur containing amino acid than lentil (Shekib *et al.* 1986).

Results in Table (9) show the amino acid content of koshoary samples (expressed as g/100 g protein) and the essential amino acid (EAA) of FAO/ WHO (1973) reference protein were also included for a comparison. Total EAA and non essential amino acid (NEAA) in koshary samples were ranged from 37.39 to 39.19% and 60.81 to 62.61% respectively. It could be observed that koshary samples were rich in leucin (7.5 to 8.02%) valine (5.12 to 5.30%) and isolucine (4.12 to 4.62%). The lowest of EAA were tryptophene and cystein. Results also show the glutamic acid (20.89%) was the highest content of NEAA, followed by aspartic acid (15.95 to 16.70%) and arginine (about 7.03%). The lowest content NEAA was histidine in sample 1, 2 while alanine was the lowest content in samples 3.

Results also showed that a comparison levels of the individual EAA in koshary samples protein with those recorded with FAO /WHO (1973) reference protein showed that koshary in deficient in lysine .

Amino acid scores (As)

Amino acid scores of koshary samples are presented in table (10). In relation to FAO / WHO (1973), koshary sample were deficient in lysine .

Amino acid scores for lysine in koshary 1,2 and 3 were 0.82, 0.83 and 0.73. This decrease in lysine content may be due to increase ratio rice from the ratio of lentil. Khalil (1999) indicated that altering koshary mixture replacing some quantity of macaroni with lential improved the nutritional value of koshary, Mahmoud (1992) recommended that eat with koshary dish, food rich in lysine and sulfur containing amino acid

such as defated Egyptian cheese. According to FAO/WHO/UNU (1985). Koshary samples showed no deficiency in all EAA.

Microbiological analysis of some traditional dishes.

Date presented in Table (11) show that total bacteria count, coliform bacteria, *E. coli, S. auerous* and salmonella in Medammis samples. Medammis samples which prepared under laboratory condition were not detected in all tested microorganisms except total bacteria count (2×10^2). Sample 2 and 3 which was collected at different site in of local shops were highly loaded with all tested microorganisms except salmonella test. The difference in the microbial count at the different two samples may be due to the variation in the sanitary condition prevailing among the different areas . The stewed beans and the materials used in their preparation, besides the used practices of handling and serving could be a major factor, contributing to contamination of the products.

Results also show that a sample 1 of taamia which was prepared under laboratory condition was not detected in all tested microorganisms except total bacteria count (2x10cfu/g). Taamia samples 2 and 3 which collected in the two different sites in local shops were contaminated with total bacteria with a value 2.3×10^3 and 1.4×10^3 cfu/g respectively. Abd El-Baki *et al.* (1991) stated that the bacteria call found in the fried taamia could be attributed to heat resistant in addition to the contamination after frying during handling. Samples 2 was not detected in coliform and *E. coli* while sample 3 was contaminated with 10×10^4 cfu / g coliform bacteria and 4.6×10^3 cfu/g *E. coli* , this in indicated that poor sanitary conditions in this shops. Both samples were contaminated with S. aureus and free from salmonella . Khalil *et al.* (2001) stated that frying food products are microbiologically stable due to lethal effect of high frying temperature for most of microorganisms, mean while, absence of personnel hygienic habits , exposure of the products to the atmosphere till sold and may be the filthy unhygienic locations of production may lead to consequent contamination of these products resulting in food borne infection.

From of the obtained results in the same table it was obvious that koshary sample 1, which prepared under laboratory condition was not detected for all

tested microorganisms except total bacteria count , koshary sample 2 and 3 which collected from two different site of local shops were highly level of total bacteria count with a values 6.4×10^4 and 3.2×10^5 cfu/g respectively. These contaminations may be due to poor quality of raw material in addition to the unsanitary handling of the product during preparation. Both samples contaminated with coliform, *E. coli* and *S. aurous* but sample 3 was the highest level of contamination. The contamination of these bacteria due to unhygienic conditions during handling the product .

Conclusion medammis, taamia and koshary are a traditional food Egypt, especially for the low and medium income groups these traditional foods is characterized by high nutritional value high content of protein, carbohydrates and a good source of some elements such as iron and phosphorous. We need to educate workers shops or consumer improving methods of processing and preservation of these foods incorporating modern technology, is recommended. Also we need for good sanitary condition in the preparation and handling these products to avoid the hazards of food born infection or increasing food safety awareness.

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Table (1): Chemical composition of Medammis (as wet and dry weight) g/ 100g

	Medammis 1		Medammis 2		Medammis 3	
	Wet weight	Dry weight	Wet weight	Dry weight	Wet weight	Dry weight
Moisture	69.50	-	70.11	-	70.50	-
Protein	5.19	17.02	7.60	25.43	7.02	23.90
Fat %	0.68	2.23	0.58	1.94	0.65	2.20
Ash %	1.5	4.92	1.20	4.01	1.10	3.73
Fiber %	2.22	7.28	2.39	7.00	2.86	9.69
Carbohydrate %	20.91	68.56	18.12	60.62	17.87	60.48
Total calories (kcal/ 100g)	110.52	362.39	108.1	361.66	105.11	357.32

Medammis 1. Product was done under laboratory conditions

Medammis 2,3 : Collected from the local shops

Table (2): Chemical composition of fired Taamia (g/100 g) as wet and dry weight

Component	Taamia 1		Taamia 2		Taamia l 3	
	Wet weight	Dry weight	Wet weight	Dry weight	Wet weight	Dry weight
Moisture %	22.68	-	30.00	-	32.00	-
Protein %	17.05	22.05	14.54	20.77	14.30	21.03
Fat %	7.0	9.05	10.2	14.57	12.5	18.38
Ash %	3.1	4.01	3.36	4.80	3.00	4.41
Fiber %	5.80	7.50	5.50	7.86	4.5	6.62
Carbohydrate %	44.37	57.39	36.40	52.0	33.7	49.56
Total calories (kcal/ 100g)	308.68	399.21	295.56	422.21	304.5	447.78

Taamia 1. Product was done under laboratory conditions.

Taamia 2,3 : collected from the local shops

Table (3) : Chemical composition of koshary (as wet and dry weight) (g/ 100g)

Component	Koshary 1		Koshary 2		Koshary 3	
	Wet weight	Dry weight	Wet weight	Dry weight	Wet weight	Dry weight
Moisture %	70.85	-	65.65	-	61.50	-
Protein %	4.89	16.78	4.94	14.38	5.05	13.12
Fat %	1.55	5.31	2.55	7.42	3.10	8.05
Ash %	0.34	1.17	0.41	1.19	0.46	1.19
Fiber %	0.09	0.31	0.08	0.233	0.16	0.42
Total carbohydrates	22.28	76.43	26.37	76.81	29.73	77.22
Total calories kcal/ 100g	122.63	420.63	148.19	431.54	167.02	433.81

Koshary 1. Product was done under laboratory conditions .
Koshary 2,3 : collected from the local shops.

Table (4): Mean values of minerals elements for different plant food dishes (as mg/100 g as dry weight)

	Fe	Mg	P	Ca
Daily requirements	10	-	800	800
Medammis				
1	9.09	151.6	340.6	59.47
2	7.13	138.4	334.5	50.27
3	5.80	138.1	337.1	48.84
Falafal				
1	7.19	142.4	313.4	66.3
2	6.37	142.2	303.0	60.9
3	5.11	137.3	289	51.5
Koshary				
1	0.235	62.41	228	17.4
2	0.221	61.06	225	17.3
3	0.173	55.13	221.7	16.3

Daily requirements (mg) on adult man daily (Wilson *et al.*, 1979)

Table (5):Amino acid composition of Medammis compared with FAO/WHO (1973) reference protein .

Amino acid	Concentration g/100 g protein			WHO/FAO reference protein
	Medammis 1	Medammis 1	Medammis 1	
Essential amino acid (EAA)				
Lysine	6.50	6.22	6.62	5.5
Leucine	7.50	7.65	7.80	7.0
Isoleucine	3.21	3.22	3.35	4.0
Phanylalanine	4.02	3.45	4.0	6.0
Tyrosine	4.0	3.85	4.72	6.0
Methionine	1.1	1.10	1.2	3.5
Cysteine	0.98	0.99	1.1	
Threonine	4.43	4.35	4.50	4.0
Valine	3.5	3.52	3.45	5.0
Trytophane	1.75	1.80	1.95	1.0
Total essential amino acid (EAA)	36.99	36.65	38.69	
Non essential amino acid (NEAA)				
Aspartic acid	12.0	12.23	12.42	
Serine	5.5	6.0	5.92	
Glutomic acid	15.88	15.75	16.0	
Proline	4.82	4.90	5.20	
Alanine	4.66	4.95	4.75	
Histidine	3.0	3.95	3.40	
Arginine	8.95	8.8	9.1	
Glycine	4.63	5.0	5.12	
Total non essential Amino acid (NEAA)	59.44	61.58	61.91	

Table (6): Amino acid score estimated for Medammis sample in relation to FAO/WHO (1973) and FAO/WHO/UNV (1985).

	Leucine	Isoleucine	Lysine	Phenylanine + Tyrosine	Threonine	Valine	Methionine + Cystine	Tryptophane	Histidine
FAO/WHO (1973)	7.0	4.0	5.50	6.0	4.0	5.0	3.80	1.0	-
Med. 1	1.07	0.80	1.18	1.34	1.00	0.7	0.59	1.75	-
Med. 2	1.09	0.81	1.13	1.30	0.96	0.7	0.60	1.8	-
Med. 3	1.11	0.84	1.20	1.95	1.18	0.69	0.66	1.95	-
FAO/WHO/ UNV(1985)	1.9	1.30	1.60	1.90	0.5	1.3	1.7	0.9	1.60
Med. 1	3.95	2.47	4.06	4.22	8.89	2.69	1.22	1.94	1.88
Med. 2	4.03	2.48	3.89	4.11	8.70	8.71	1.23	2.0	2.47
Med. 3	4.11	2.58	4.19	4.58	9.0	2.65	1.35	2.17	2.94

Table (7) : Amino acid composition of Taamia samples compared with FAO/WHO (1973) reference protein.

Amino acid	Concentration g/10 g protein			FAO/WHO (1973) reference protein
	Falafel 1	Falafel 1	Falafel 1	
Essential amino acid (EAA)				
Lysine	7.0	6.90	6.73	5.5
Leucine	8.0	8.20	8.03	7.0
Isoleucine	4.20	4.50	3.09	4.0
Phenylalnine	4.50	4.00	4.47	6.3
Tyrosine	4.0	3.95	3.72	6.3
Methionine	0.9	1.0	0.95	3.5
Cysteine	0.5	1.0	1.2	3.5
Threonine	4.45	4.50	4.21	4.0
Valine	5.50	5.0	5.00	5.0
Tryptophane	1.50	1.20	1.50	1.0
Total essential amino acid (EAA)	40.55	40.25	38.90	
Non essential amino acid (NEAA)				
Aspartic acid	11.00	12.0	12.23	
Serine	4.0	4.95	5.72	
Glutomic acid	15.86	15.0	15.0	
Proline	5.0	4.80	4.95	
Alanine	5.90	6.0	6.0	
Histidine	3.95	4.0	3.40	
Arginine	8.55	8.0	8.50	
Glycine	5.22	5.0	5.30	
Total non essential amino acid (NEAA)	59.48	59.75	61.1	

Table (8) : Amino acid scores estimated for Taamia samples in relation to FAO/WHO (1973) and FAO/WHO /UNU (1985).

	Leucine	Isoleucine	Lysine	Phenylanine + Tyrosine	Threonine	Valine	Methionine + Cystine	Tryptophane	Histidine
FAO/WHO (1973)	7.0	4.0	5.5	6.3	4.0	5.0	3.5	1.0	-
Taamia 1	1.14	1.05	1.27	1.3	1.11	1.10	0.4	1.5	-
Taamia 2	1.17	1.13	1.25	1.21	1.12	1.0	0.57	1.2	-
Taamia 3	1.15	0.77	1.22	1.30	1.05	1.0	0.61	1.5	-
FAO/WHO UNU (1985)	1.9	1.3	1.6	1.9	0.5	1.3	1.7	0.9	1.6
Taamia 1	4.20	3.23	4.38	4.31	8.90	4.23	0.82	1.67	2.61
Taamia 2	4.32	3.46	4.37	4.18	9.0	3.85	1.17	1.33	2.5
Taamia 3	4.23	2.37	4.21	4.31	8.42	4.42	1.15	1.67	2.13

Table (9) : Amino acid composition of Koshary samples compared with FAO/WHO (1973) reference protein.

Amino acid	Concentration g/10 g protein			FAO/WHO (1973) reference protein
	Koshary 1	Koshary 2	Koshary 3	
Essential amino acid (EAA)				
Lysine	4.5	4.45	4.0	5.5
Leucine	8.02	7.95	7.50	7.0
Isoleucine	4.62	4.52	4.12	4.0
Phenylalnine	4.0	4.01	3.95	6.3
Tyrosine	3.97	3.78	3.99	6.3
Methionine	2.21	2.10	2.09	3.5
Cysteine	1.62	1.50	1.33	3.5
Threonine	3.95	4.22	4.26	4.0
Valine	5.30	5.12	5.20	5.0
Tryptophane	1.0	0.95	0.95	1.0
Total essential amino acid (EAA)	39.19	38.4	37.39	
Non essential amino acid (NEAA)				
Aspartic acid	16.0	16.70	15.95	
Serine	4.0	4.50	4.32	
Glutomic acid	20.89	20.95	21.92	
Proline	3.32	3.2	3.51	
Alanine	3.48	3.10	2.95	
Histidine	3.0	2.95	3.82	
Arginine	7.0	7.04	7.05	
Glycine	3.12	3.16	3.09	
Total non essential amino acid (NEAA)	60.81	61.6	62.61	

Table (10) : Amino acid scores estimated for Koshary samples in relation to FAO/WHO (1973) and FAO/WHO/ UNV (1985).

	Leucine	Isoleucine	Lysine	Phenylanine + Tyrosine	Threonine	Valine	Methionine + Cystine	Tryptophane	Histidine
FAO/WHO (1973)	7.0	4.0	5.5	6.3	4.0	5.0	3.50	1.0	-
Koshary 1	1.15	1.16	0.82	1.27	1.0	1.26	1.02	1.0	-
Koshary 2	1.14	1.01	0.83	1.24	1.01	1.02	1.03	0.95	-
Koshary 3	1.07	1.03	0.73	1.26	1.0	1.04	0.98	0.95	-
FAO/WHO/ UNV (1985)	1.9	1.3	1.6	1.9	0.5	1.30	1.7	0.9	1.6
Koshary 1	4.22	3.55	2.81	4.19	7.9	4.08	2.25	1.1	1.88
Koshary 2	4.18	3.40	2.84	4.10	8.04	3.9	2.12	1.06	1.94
Koshary 3	3.95	3.17	2.50	3.2	8.0	4.0	2.01	1.06	2.39

Table (11) : Microbial analysis for some traditional foods

Bacterial count	Medammis		
	1	2	3
Total count (cfu/g)	$2x10^2$	$3.10x10^5$	$4.7x10^5$
Coliform group (cfu/g)	N.D	$6x10^2$	$5x10^3$
E. coli (cfu/g)	N.D	$5x10^2$	$4x10^3$
S. aureus	N.D	$0.3\ No^2$	$0.45x10^2$
Salmonella	N.D	N.D	N.D
		Falafel	
	1	2	3
Total count (cfu/g)	2 x10	$2.3x10^3$	$1.4x10^3$
Coliform group (cfu/g)	N.D	N.D	$10x10^4$
E. coli (cfu/g)	N.D	N.D	$4.6x10^3$
S. aureus	N.D	$1.2x10^2$	$2.5x10^2$
Salmonella	N.D	N.D	N.D
		Koshary	
	1	2	3
Total count (cfu/g)	10	$6.4x10^4$	$3.2x10^5$
Coliform group (cfu/g)	N.D	$1x10^2$	$2x10^6$
E. coli (cfu/g)	N.D	$6.1x10^2$	$3.4x10^6$
S. aureus	N.D	$0.02x10^2$	$2.2x10^7$
Salmonella	N.D	N.D	$1.1x10^2$

1 Product was done under laboratory conditions.

2,3 Collected from the two local shops.

تقييم تغذوى وميكروبيولوجى لبعض الاغذية التقليدية

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لقد استهدفت هذه الدراسة تقيماً تغذوياً وميكروبيولوجياً لبعض الأطباق التقليدية مثل المدمس والطعمية والكشري حيث تم تجميع العينات من مكانين مختلفين من المحلات العامه بمدينة الزقازيق – الشرقية – مصر وأيضاً تم إعداد نفس الأطباق تحت الظروف المعملية طبقاً لنظام الأطباق المصرية ولقد أوضحت النتائج أن البروتين والكربوهيدرات وهى المكونات الرئيسية فى هذه الأطباق حيث تراوحت نسبة البروتين مابين ٢ ٠ر١٧ إلى ٤٣ر٢٥ % على أساس الوزن الجاف فى طبق الفول المدمس و ٧٧ر٢٠ إلى ٠٥ ر ٢٢% للطعمية و ١٢ر١٣ إلى ٧٨ر١٦ % لطبق الكشري بينما تراوحت نسبة الكربوهيدرات ٤٨ر٦٠ إلى ٥٦ر٦٨ % لطبق المدمس و ٥٦ر٤٩ إلى ٣٩ر٥٧ % للطعمية ٤٣ر٧٦ إلى ٢٢ر٧٧% لطبق الكشري ومن التقييم الكيماوي نجد أن المدمس والطعمية والكشري تسد احتياجات الشخص البالغ اليومية من الحديد بنسبة ٧٣، ٦٢ ، ١ر٢١% على التوالي ٠

كما أوضحت النتائج المتحصل عليها أيضاً أن الاحماض الامينية الاساسية والاحماض الامينية الغير أساسية تراوحت مابين ٦٥ر٣٦ إلى ٦٩ر٣٨ % و ٤٤ر٥٩ إلى ٩١ر٦١ % على التوالى بالنسبة لطبق الفول المدمس و ٩ر٣٨ إلى ٥٥ر٤٠ % و ٤٨ر٥٩ إلى ٩١ر٦١ % على التوالى بالنسبة لطبق الطعمية و ٣٩ر٣٧ إلى ١٩ر٣٩ % و ٨١ر٦٠ إلى ٦١ر٦٢ % بالنسبة لطبق الكشرى .

وأيضاً أظهرت نتائج التحليل الميكروبيولوجى أن عينات المدمس والكشرى التى تم تجميعها من المحلات العامه عالية المحتوى من العدد الكلى للبكتريا الهوائية وبكتريا **E. coli** و **S. aureus** وهذا يعكس أن اعداد هذه الاطباق وتداولها لم يكن تحت الظروف الصحية الملائمة.