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Quality Of Some Meat Products Collected From Street Vendors In Behiera Governorate Eypgt,

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Abstract:

The quality of some meat Products (liver and sausage sandwich) collected from street vendors Behiera Governorate were evaluated for chemical composition, minerals content, amino acids, fatty acids, freshness indicators (total volatile basic nitrogen, ammonia nitrogen & thiobarbituric acids) and sensory evaluation. The results showed that the moisture content was higher for liver (57.34%) that sausage sandwich (38.00%) with a significant differences. Liver sandwich had more pronounced proteins, which loss fat, ash and carbohydrates in sausage sandwich. The total Calories were appreciable more (366Kcal/100g) as compared with that of the liver sandwich (199Kcal/100g). Only protein and carbohydrates of sausage sandwiches fell in the Dietary reference intakes (DRI) range. Protein of liver sandwich was higher than DRI with significant differences. Highest percentage of DRI value was found for protein of liver sandwich consumed by females was only 50.61%. DRI value of all nutrients was revealed the better results for females than males. Minerals content were higher in liver than sausage sandwiches. Protein of sausage sandwiches (g/100g sample) had high amino acids levels compared that of the liver. **EAAI** were higher for liver than sausage sandwiches. All Essential amino acids) EAA) values (g/100g sample) were less than DRI of male and female for sausage sandwiches or liver sandwiches. Sausage sandwiches had less total saturated fatty acids, and higher total fatty acids in comparison with liver sandwiches. Liver sandwiches were loaded more with bacteria, molds and yeasts.

Sensory evaluation indicated that none of sandwiches tested were rejected. Although, chemical characteristics of both sandwiches were undesirable, rated fair to good with significant differences.

Key words: Liver, sausage sandwich, Chemical composition, Street vendor Quality.

Introduction

Street foods are foods obtainable from a street side vendor, often from a make shift or portable stall. While some street foods are regional, many are not having spread beyond their region of origin. The food and green groceries sold in farmers' markets may also fall into this category, including the food exhibited and sold in gathering fairs, such as agricultural show and state fair. According to the Food and Agriculture Organization (FAO), 2.5 billion people eat street food every day (Barth, 1986). Street foods and fast foods are low in cost as compared with restaurant meals and offer an attractive alternative to home-cooked food. In several, reports have shown that street vendors are generally unaware of basic food-safety issues, lack knowledge about food hygiene, and have little education (WHO -INFOSAN, 2010). For example, Duitschaever *et al.*, (1977) stated that source of contamination during preparation of mixed food dishes, can be decreased by good practices of personal hygiene and equipment sanitation. The main sources of contamination are usually the raw beef, cutting board, worker hands and curing brine. Although some street foods have been found to be contaminated and serious illnesses have been related to them, in general very few cases of food poisoning have been found (Tinker, 1987). Also, Toumi *et al.*, (1974) suggested that when cooking of cooked food was not carried out properly and the temperature from 50°C to 10°C did not pass quickly, growth of microorganisms including pathogens was possible. Furthermore, Baird-Parker (1980) studied the range of contamination of raw meat and meat products and discussed measure of elimination or reducing the level of contamination during harvesting, processing, storage, distribution and handling of food. Meat and meat products such as raw meat, ground meat and liver as well as meat products such as Sausage, Kofta, Burger and Luncheon sandwiches have been incriminated human listeriosis in many countries specially the bacterium can grow and multiplies readily at refrigerator temperature

(Siefert *et al.*, 2013). Finally, Rashed, *et al.*, (2014) reported that consuming of meat and meat products sandwiches, as fast meal and ready-to-eat foods, sold in many locations of Great-Cairo city, may possess a serious challenge to the public health authorities and hazardous food for the consumer. The contribution of the street-vending industry to socio-economic growth is enormous (Cho *et al.*, 2011). Lydia *et al.*, (2013) mentioned that several hot-grilled and cold-cooked street foods that were included in the study exhibited unsatisfactory and unacceptable microbiological quality that posed health risks for consumers. So the aim of study, The quality of some meat Products (liver and sausage sandwich) collected from street vendors Behiera Governorate were evaluated for chemical composition, minerals content, amino acids, fatty acids, freshness indicators (total volatile basic nitrogen, ammonia nitrogen & thiobarbituric acids) and sensory evaluation.

Materials And Methods

Materials:

Liver and sausage sandwiches:

Liver and sausage sandwiches were obtained from local street vendors at Behiera Governorate.

Methods:

Analytical Methods:

Moisture, protein (Keldahl method $TN \times 6.25$), fat (hexane solvent, Soxhielt apparatus), fiber and ash were determined according to the method recommended by A. O. A. C. (2010).

Carbohydrates and energy value:

Carbohydrate calculated by differences as follows:

$\% \text{ Carbohydrates} = 100 - (\% \text{ moisture} + \% \text{ protein} + \% \text{ fat} + \% \text{ ash} + \% \text{ fiber})$.

Energy value was estimated by the sum of multiplying protein and carbohydrates by 4.0 and fat by 9.0 according to FAO (1982).

Evaluation of nutritional value:

To evaluate different products, consumed amount of sausages to cover the daily requirements of adult man (G, D, R, g) in protein or energy 63 and 2900 kcal., respectively, was calculated. According to (RDA, 1989) percent (%) satisfaction of the daily requirements of adult

man in protein and energy when consuming 150 mg of sausages (P, S, /150) was also calculated.

Energy value was calculated for 19-30 years old male and female 19-30 years old as the youth like to consume fast foods. Males and females are weight 72 and 58 Kg, height 177 and 164 cm, respectively. The following DRI for males were used for estimation of total calories (Kcal).

Adult male: $662 - (9.53 \text{ age}) + 1.25*(19.5 \text{ Wt} + 5396 \text{ ht})$.

Adult female: $354 - (6.91 \text{ age}) + 1.27*(9.36 \text{ Wt} + 726 \text{ ht})$.

When Wt =weight, ht =n height7 the physical activity values for male (1.25) and female (1.27).

Essential amino acids index (E.A.A.I.) in relation to egg protein was determined as described by **Oser (1959)** using concentrations (g / 16 g N) of isoleucine, leucine, lysine, threonine, tryptophan, valine, histidine, methionine + cystine and henylalanine + tyrosine:

$$\text{E.A.A.I.} = \frac{\text{Isoleucine. P}}{\text{Isoleucine. S}} \times \frac{\text{Leucine. P}}{\text{Leucine. S}} \times \dots \times \frac{\text{Phenylalanine + tyrosine. P}}{\text{Phenylalanine + tyrosine. S}}$$

Where P refers to the experimental protein and S the standard protein (whole egg).

Biological value (B.V.) of protein calculated as follows:

$$\text{B.V.} = 1.09 \times \text{EAAI} - 11.73$$

Calculation of protein efficiency ratios (PER) of products obtained, using amino acids composition (g / 16 g N) was carried out by 3 equations as described by **Alsmeyer et al., (1974)**:

$$\text{PER}_1 = - 0.684 + 0.456 (\text{Leucine}) - 0.047 (\text{Proline})$$

$$\text{PER}_2 = - 0.468 + 0.454 (\text{Leucine}) - 0.105 (\text{Tyrosine})$$

$$\text{PER}_3 = - 1.816 + 0.435 (\text{Methionine}) + 0.78 (\text{Leucine}) + 0.211 (\text{Histidine}) - 0.944 (\text{Tyrosine})$$

As indicated by the amino acids composition (g / 100 g sample, wet weight basis), grams consumed to cover the daily requirements of adult man in each of the essential amino acids (G.D.R. values) were calculated using dietary allowances given by **FAO/WHO/UNU (1985)**.

Determination of amino acids:

Acid hydrolysis was carried out according to the **Block et al. (1958)**.

Total amino acids of the FF meals were determined according to the method of **Etsushiro *et al.*, (1981)** using Automatic Amino Acid Analyzer 400 (AAA400) INGOS LTD.

Determination of fatty acids:

The method of **AOAC (2005)** was conducted for lipid extraction from sample using Chloroform methanol (2:1 v/v) to extract the lipids. The lipid samples were saponified over night with ethanoic KOH (20%) at room temperature (**Vogel, 1975**).

Identification and determination of fatty acids were carried out by gas liquid chromatography (GLC) using the method described by **Farag *et al.*, (1981)**.

Determination of total volatile nitrogen (TVN)

Total volatile nitrogen was determined according to the method was described by **Winton and Winton (1958)**.

Determination of amino nitrogen (AN)

The amino nitrogen content of ground sample was estimated using the formal volumetric titration method as described by **Kolochov (1952)**.

Determination of thiobarbituric acid value (TBA)

TBA value was determined as described by **Pearson (1970)** which could be summarized as follows: Ten grams sample was distilled (distilled water + 4N Hcl) for 10 minutes, 5 ml. of the distillate was added to 5 ml. TBA solution (0.28839g TBA / 100 ml of 90% glacial acetic acid) into a stopper tube, which was then heated in boiling water for 35 minutes. After cooling measurements were carried out calorimetrically at 538 nm., the TBA value was calculated by multiplying the absorbency by the factor (7.8) and the results were presented as grams of malonic / kg sample.

Determination of minerals content

Minerals (Fe, S and P) were determined using Atomic Absorption and Flame Photometers analysis in the Agricultural Research Center, Giza, Egypt. Using the methods Published in the **A.O.A.C (2005)**.

Microbiological methods:

Preparation of liver and sausages samples for microbiological analysis:

Ten grams of each sample were homogenized with 90 ml. of distilled water so as to give 0.1 dilutions. Then different dilutions ($1:10^{-1}$ to $1:10^{-6}$) were prepared to be used for microorganisms tests. Determination of total aerobic bacterial count by the standard plate count method (**Oxoid Manual, 1979**), *Staphylococcus aureus* determined on Paired parker agar base media (**ICMSF, 1996**), While Molds and yeast, enumerated in potato dextrose agar (**ICMSF, 1996**), Coliform bacterial (Oxoid) enumerated on Endo agar media (**WHO, 1988**), *Salmonella sp.* & *Shigella* SS agar modified Oxoid according to (**Bryan, 1991**) and *Bacillus cereus* determined on *Bacillus cereus* selective agar medium with supplement SR99 (**Roberts, 1991**).

Organoleptic evaluation of tested sandwiches:

Organoleptic evaluation of liver and sausage sandwiches carried out by aid of (Twenty judges) according to **American Meat Science Association (1995)**.

Statistical analysis:

Analysis of variance was conducted for the data in accordance with procedures described by **Steel and Torrie (1980)**. L.S.D. at 5 % level of significance was used to compare between means.

Results And Discussion

Gross chemical composition

Data presented in Table (1) show the gross chemical composition of street liver and sausage sandwiches vended in El-Beheira Governorate. It is evident that the moisture content was higher for liver (57.34%) than sausage sandwich (3.8%) with a significant differences. This seems to be depending on the rate of filling of materials sausage sample. Such explanation holds true for different levels of other constituents. Anyhow, liver sandwich had more pronounced proteins, which loss fat, ash and carbohydrates in sausage sandwich the total Calories were appreciable more (366Kcal/100g) as compared with that of the liver sandwich (199 Kcal/100g). The fat content of sausage sandwich draw one's attention, because it remarkably high. As reported by **Paul and Southgate (1978)**, beef sausage contains 18%fat, while that of bread is 1.70%. When the sausage sandwich prepared it should contain

even less than 18% Fat due to the thinning effect, e.g. fat dilution because of bread addition. Also, according to **Paul and Southgate (1978)**, protein and fat level of fried liver are 26.9% and 13.2%, respectively, and it seems that both decreased when sandwich prepared due to dilution effect of bread (being 23.28 and 7.80 %, respectively) due to addition of bread. Moreover, it seems possible that carbohydrates (as wheat flour and starch) when added during processing of sausage raised the level of carbohydrates in sausage sandwich than liver sandwich than pronounced a higher fat and carbohydrates the total calories calculated for sausage than liver sandwich, it were being 365.7 and 199.08 Kcal/100g, respectively.

Results of Table (2) show the distribution of energy among macronutrients in sausage and liver sandwiches. It is obvious that only protein and carbohydrates of sausage sandwiches fell in the DRI range, other nutrients were either more or less the reference (RF). Protein of liver sandwich was higher than DRI with significant differences, while fat of sausage and liver sandwich and carbohydrates of liver sandwich which were less than the reference with no significant differences. It is expected that other foods taken by the consumer will connect nutrient level in one day. Street sandwich are mostly consumed by the youth, there for needed total calories for 19-30 years old for males (72 Kg Wt. 177 Cm length) and females (58 Kg Wt. , 164Cm length) as calculated using the equations given by **DRI (2002-2005)** .The DRI ranges for protein, carbohydrates, fat and fibers used for evaluation of nutritional value of street sandwich.

The results of evaluation are presented in Table (3). Moreover grams consumed to cover the daily requirements of male and female (GBR g) and percent satisfaction of the daily requirements of male and female when taking 250 of sandwich are presented in Table (4). It is clear Table (3) that the intake of 100 g of sandwich did not cover the DRI considering any of nutrients, especially the fibers that showed 0.05-0.12% of DRI for both liver and sausage. Highest percentage of DRI value was found for protein of liver sandwich consumed by females was only 50.61%. From Table (3), it could be noticed , based on DRI value of all nutrient, that each of liver and sausage sandwiches were revealed better results for females than males .This due to the DRI (in case of all nutrients) values are less for females than males. GDR values were

more and PS\250 lower for females than males considering both liver and sausage sandwiches, indicating that these sandwiches were more nourishing for girls than boys. Lowest GDR and highest Ps\250 values were recorded for fibers, while the reverse was found for protein ,except in case of sausage sandwiches consumed by females in concern to fat showing less GDR and more PS\250 than proteins because of the considerable high fat Table (1). It may be concluded that based on above evaluations the liver and sausage sandwiches are actually poor in nutrients, especially the fibers .Taking as high as 250 g. don't change this situation. Exception was the protein of liver sandwiches showing over 100 of PS\250 when 104 and 127% in both males and females. Consumption of more than 250 g. of sandwiches may be not reasonable. Accordingly these sandwiches maybe considered as snacks, but not a basic food, this because of appreciably low fibers and possibly some other nutrients.

Minerals content of liver and sausage sandwiches:

The results of Table (5) show the levels of Fe, S, & P in liver& sausage sandwiches. It could be observed that their minerals were higher in liver than sausage sandwiches. From results of Tables (5), it evident that Fe, S, & P in model sandwiches (20% mineral food “fried beef liver or fired beef sausage + 20% of bread were higher than that of the El-Beheira Street products. This may indicate that minerals of El-Beheira Street liver & sausage subjected to loss. Possibly liver and beef of sausage were frozen–stored, accordingly minerals escaped when thawing.

Amino acids composition:

Data presented in Tables (8-9) show the essential amino acids (EAA) composition of sausage and liver sandwiches of present work and their evaluation, as well as the amino acids composition of model sandwiches calculated by the another using data of **Paul & Southgate (1978)** they found that amino acids composition of beef sausage and cooked liver "20%" plus amino acids composition bread "80%", protein content of both and the DRI levels of protein and amino acids "2002/2005". It could be observed Tables (8 - 9) that protein (g/100g) of sausage sandwiches had high amino acids levels that of the liver, meanwhile as g/100g sample the reverse was found, and this could be due to higher protein content in sausage sandwiches(23.28) than that of

the liver sandwich (14.97%) as shown in Table (1). Anyhow regardless of the higher concentration of (AA) in sausage than liver, the protein quality in the second case was better than in the first one. EAAI (65.09) and B.V. (59.22%) were higher for liver than sausage sandwiches. Also FER was higher in the first, the second case (3.25 & 2.94, respectively) due to better quality of liver than beef. All EAA values (g/100g sample) were less than DRI of male and female for sausage sandwiches or liver sandwiches.

Fatty acids:

Data presented in Table (8) show the fatty acid composition (FA) of sausage sandwiches. It could be observed that sandwiches had less T. Sat. FA (64.97%, 70.09 %, respectively), and higher T. monoenoic FA (18.57, 16.15%, respectively), polyenoic FA (161.44 & 13.76% respectively) and T.unsat.FA (35.3 & 29.91%, respectively) in comparison with liver sandwiches. It could be observed that model sandwiches Table (8) had less T.Sat .FA (23.76%) and higher T. polyunsat FA (58.6%) and T.unsat.FA (76.24%) than that of street sandwiches (Table8(. This indicated the higher unsaturation of model sandwiches fat confirmed by the lower T.Sat.FA/ T.unsat. FA (0.32-0.31, respectively) as compared to that of street sausage and liver sandwiches (1.86, 2.34, respectively). This may be possibly ascribed to that street sandwiches fat was subjected to lipids oxidation leading to decrease of un-saturation. For street products un-saturation of fat (Table 8) in liver. sandwiches was less than that of the sausage sandwiches, while the reverse was recorded for model sandwiches. This may indicate that liver of street sandwiches were previously frozen stored leading to oxidation of lipids. Wrong handling of street liver sandwiches may also enhance the lipids oxidation. Nutritional value of street and model sausage and street sandwiches was calculated based on the levels of essential n-6 and n-3 FA, and results are shown as in Table (8).

Microbiological characteristics.

Total bacterial count (TBC) as well as *E. coli*, *Staphlococcus aureus*, *Bacillus cerues* and molds & yeasts counts enumerated in Table (9). It is clear that street liver sandwiches were loaded more with bacteria & molds plus yeasts. In both products the microbiological load was more than Ref. Therefore both products should be rejected.

According to she repoted that all sandwiches collected from the local market of Tanta (Gharbia Governorate) were rejected microbiologically.

4.7. Sensory evaluation:

Data presented in Table (10) show the mean scores for aroma, taste, texture, color and overall acceptability of street sausage and liver sandwiches. From results of Table(10), it is evident that none of sandwiches tested were rejected. Although chemical characteristics were undesirable, both sandwiches rated fair to good with significant differences. This might be attributed to the spices added during cooking. Venders know the simple fact that if their products are unaccepted organoleptically, no sandwiches will be sold.

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Table (1): Chemical composition of liver and sausage sandwiches

Parameters	Liver		Sausage	
	WWB	DWB	WWB	DWB
Moisture%	57.34± 01 ^a		38.00±02 ^b	
Protein %	23.28±03 ^a	54.57±21a	14.97±01 ^b	24.15±01 ^b
Fat%	7.80±1.2 ^b	18.28±02b	26.30±11 ^a	42.42±12 ^a
Fiber%	0.03±20 ^a	0.07±01a	0.02±02 ^a	0.03±31 ^a
Ash%	2.61±01 ^b	6.12±22a	3.43±30 ^a	5.53±01 ^b
Carbohydrates%	8.94±13 ^b	20.96±41b	17.28±21 ^a	27.87±03
Total energy(Kcal/100g)	199.08	466.67	365.70	589.86

WWB: wet weight basis; DWB: dry weight basis.

Mean under the same column bearing different superscript letters are different significantly (p < 0.05).

Table (2): Distribution of total calories

Parameters	Protein	Fat	Carbohydrates
Sausage sandwiches	16.37±01 ^b	18.90±02 ^a	64.73±11 ^a
Liver sandwiches	46.78±11 ^a	17.96±21 ^a	35.26±01 ^b
DRI(2002/2005)	10-35	20-35	45-65

Mean under the same column bearing different superscript letters are different significantly (p < 0.05).

Table (3): Nutrients in liver and sausage street sandwiches as percent of DRI

Parameters	Calculated DRI		Liver sandwiches %of DRI		Sausage Sandwiches %of DRI	
	Male	Female	Male	Female	Male	Female
T. calories Kcal/100g	3050	2383	6.53	8.53	11.99	14.35
Protein (g)	56	46	41.57	50.61	26.37	32.54
Fat	102	79	7.65	9.87	25.78	33.29
Fibers	38	25	0.08	0.12	0.05	0.08
Carbohydrates	477	372	1.87	2.40	3.62	4.65

Table (4): GDR (g) and PS/250 (%) on consumption of liver and sausage sandwiches

Parameters	DRI		Liver sandwiches				Sausage Sandwiches			
	Male	Female	GDR (g)		PS/250%		GDR (g)		PS/250%	
			Male	Female	Male	Female	Male	Female	Male	Female
T. calories (K Cal/100g)	2050	2383	1532	1197	16	21	834	625	30	38
Protein (g)	56	46	241	198	104	127	374	307	67	81
Fat	102	79	1308	1013	19	25	388	300	65	83
Fibers	38	25	1266667	83333	0.20	0.30	140000	1250000	0.13	0.20
Carbohydrates	477	372	5336	4161	5	6	276	215	9	12

Table (5): Minerals contents of liver and sausage sandwiches (mg/100g)

Parameters	Fe	S	P
Liver sandwiches	0.63±01 ^a	17.16±02 ^a	71.0±21 ^a
Sausage sandwiches	0.49±11 ^u	15.20±01 ^u	48.0±03 ^u

Means under the same column bearing different superscript letters are different significantly (p < 0.05).

Table (6): Essential amino acids composition (EAA) of liver and sausage sandwiches

Amino acid	DRI			Sausage sandwiches		Liver sandwiches	
	g/100g protein	g/100sample		g/100g protein	g/100g sample	g/100g protein	g/100g sample
		Male DRI for protein 56 g	Female DRI for protein 46 g				
Isoleucine	2.5	1.4	1.2	2.61	0.61	3.11	0.47
Leucine	5.5	3.1	2.5	5.88	1.37	6.44	0.96
Lysine	5.1	2.9	2.4	0.95	0.22	5.30	0.79
Threonine	2.7	1.5	1.2	2.96	0.69	5.17	0.77
Tryptophan	0.7	0.4	0.3	0.43	0.10	0.61	0.09
Valine	3.2	1.8	1.5	3.50	0.82	3.80	0.57
Histidine	1.8	1.0	0.8	1.95	0.45	2.15	0.32
Methionine +Cystine	2.5	1.4	1.2	2.00	0.47	2.73	0.41
PhenylAlani ne+Trosine	4.7	2.6	2.2	4.9	0.14	8.41	1.26
	AAI			42.09		65.09	
	B.V.%			34.15		59.22	
	PER			2.09		2.14	

Table (7): Fatty acids composition of sausage and liver sandwiches (g / 100g)

Fatty acids	Percentage (%)	
	Sausage	Liver
<u>Saturated fatty acid (SFA)</u>		
C14 : 0	0.69	0.56
C15 : 0	0.41	0.30
C16: 0	18.70	22.37
C17: 0	2.41	1.82
C18 : 0	42.76	45.04
Total	64.97	70.09
<u>Unsaturated USFA</u>		
C 14 : 1	0.04	
C15 : 1	0.04	
C17 : 1	1.73	
C18 : 1 (n -9 FA)	16.76	16.15
<u>polyunsaturated FA</u>		
C18: 2 (n -6 FA)	16.46	13.76
Total USFA	35.03	29.91
SFA/USFA	1.86	2.34

Table (8): TVN, TBA and AN levels of sausage and liver sandwiches

Parameters	TVN(mg/100g)		TBA (mg/kg)		AN	
	Ref (20mg/100g)		Ref (0.9mg/kg)		Ref (14mg %)	
	Mean	% of Ref	Mean	% of Ref	Mean	% of Ref
Liver sandwiches	38±02	190	1.35±010	150	20.75±12	148
Sausage sandwiches	33±01	165	1.33±03	148	18.28±01	131

Means under the same column bearing different superscript letters are different significantly (p < 0.05).

Table (9): TBC, *E. coli*, *Staphylococcus aureus*, *Basillus aureus* and molds & yeast, counts as estimates Sausage and for street liver sandwiches.

Parameters	TBC Ref.<1*10 ³ c.f.u	<i>E. coli</i> Ref.< 10 ² c.f.u	<i>Staphylococcus aureus</i> Ref. None c.f.u	<i>Basillus cereus</i> Ref.<100/g c.f.u	Molds & yeast Ref.< 10 c.f.u
Liver Sandwiches	4.7×10 ⁶	5.1×10 ³	2.4×10 ²	6.5×10 ⁴	0.4×10 ³
Sausage sandwiches	3.9×10 ⁶	4.3×10 ³	1.4×10 ²	3.1×10 ⁴	0.1×10 ³

Table (10): Organoleptic evaluation of sausage and liver sandwiches (average score).

Parameters	Aroma	Taste	Texture	Color	Overall acceptability	Fried
Liver sandwiches	9.27 ^a	9.03 ^a	6.03 ^b	7.04 ^a	7.75 ^a	Fair
Sausage sandwiches	8.75 ^a	8.05 ^b	7.08 ^a	8.46 ^a	8.36 ^a	Good

جودة بعض منتجات اللحوم التي تم جمعها من الباعة الجائلين في الشوارع بمحافظة البحيرة

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الملخص العربي:

تم في هذا البحث تقييم التلوث الميكروبي لبعض الأغذية المصنعة والمعدة للبيع في الشوارع. حيث تم دراسة نوعين مختلفين من الأغذية المصنعة وهي عينات من السجق والكبدة من الباعة الجائلين في الشوارع المتحصل عليها من محافظة البحيرة. تم تقدير مدى جودة هذه الأغذية عن طريق تقدير التركيب الكيميائي للسجق والكبد الجاهزة للأكل ومحتواها من الأحماض الأمينية و الأحماض الدهنية والنيروجين الكلي المتطاير والنيروجين الأميني ومدى تزنخ الدهون والخواص الطبيعية والخواص الحسية و مدى التلوث بالميكروبات المسببة للأمراض. أظهرت النتائج ان محتوى الرطوبة أعلى في سندوتشات الكبدة بنسبة (57.34%) من سندوتشات السجق بنسبة (38.00%). مع وجود اختلافات كبيرة منها زيادة البروتينات في سندوتشات الكبدة بصورة واضحة وانخفاض الكربوهيدرات والدهون والرماد في سندوتشات السجق. وبلغت السرعات الحرارية لسندوتش السجق (365.70) سعر حراري (100جم) بالمقارنة بسندوتش الكبدة حيث بلغت سرعات الحرارة (199.08) سعر حراري (100جم)، ولكن نسبة البروتينات والكربوهيدرات في سندوتشات السجق كانت منخفضة في النطاق القياسي. بينما كانت نسبة البروتين في سندوتشات الكبدة أكثر من المدى المقترح للمتناول الغذائي القياسي، بينما كانت نسبة الدهون في سندوتشات كل من السجق والكبدة أقل من المرجح. كما كانت نسبة الكربوهيدرات في سندوتشات الكبدة أقل من النطاق القياسي الحد الأقصى من المتناول الغذائي القياسي تم تواجدها في نسبة البروتين من سندوتشات الكبدة التي يستهلكها الإناث فقط بنسبة 50.61% في كل من سندوتشات الكبدة والسجق كانت قيم جميع العناصر الغذائية وقيمة المتناول الغذائي القياسي المثوية أفضل بالنسبة للإناث من الذكور. كما كانت نسبة المعادن في سندوتشات الكبدة أعلى من سندوتشات السجق و سندوتشات السجق كانت أعلى في دليل الأحماض الأمينية بالمقارنة بسندوتشات الكبدة. كل قيم الأحماض الأمينية الأساسية (جرام/100 جرام للعينة) كانت أقل من المتناول الغذائي القياسي للذكور والإناث في كل من سندوتشات الكبدة والسجق. كما ان الأحماض الدهنية الحرة كانت نسبتها أعلى في سندوتشات السجق من سندوتشات الكبدة (3.25 و 2.94) على التوالي. بينما سندوتشات السجق كانت أقل في مجموع الأحماض الدهنية المشبعة ولكن أعلى في مجموع الأحماض الدهنية ككل مقارنة بسندوتشات الكبدة. أظهرت النتائج المتحصل عليها ان كل من عينات الكبدة والسجق تحتوي على البكتيريا الضارة المسببة للأمراض والخمائر. كما أظهرت النتائج أيضا أن سندوتشات الكبدة والسجق مقبولة في من حيث الخواص الحسية بالرغم من انها منخفضة القيمة الغذائية.

الكلمات الدالة: سندوتشات الكبد والسجق، التركيب الكيميائي، تقييم جودة الاغذية من الباعة الجائلين.