

Study and Evaluation Some of the Biochemical Variables and Industrial Pollutants in Industrial Yoghurt Serum

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Abstract:

This research provides new data to evaluate the levels of minerales (Zn,Cu,Fe) and some biochemical parameters (Lipid,Lactose,Protein,pH) on the quality of the fermented yoghurt .We have been taken 21 yoghurt samples as seven groups each group contains 3 yoghurt samples according to its companies.Turkish,Iraqi,Iranian and Jordanion produce were obtained from the local markets.To determine the minerals we have used atomic absorption spectrophotometer and for measuring biochemical parameters pH-meter,colorimetric method and Gledil method have been used.The results confirm that an important difference between Lipid ,Lactose, Copper and Iron which represents($p<0.05$) in all the companies and between protein and zinc which have higher signifance ($p<0.05$) all of them.

Introduction :-

Yoghurt is a valuable health food for both infants and elderly people ⁽¹⁾ , and can be good source of essential nutrients as minerals zinc , copper , and iron in the human diet^(2,3,4). The process by which the yoghurt is made make the mineral .More bio available and readily absorbed than those found in raw milk^(5,6) Also the nutritional value of milk proteins is well – preserved during the fermentation process ⁽⁷⁾ . , Recently, the world health organization (WHO) has recomanded values of provisional to in take weekly for copper , Zinc and iron based on the results of toxicological studies ^(8,9).

2-The objective from research .

The main objective of this research is to obtain representative data on levels of toxic organic pollutants mineralse in yoghurt consumed by the general population in Iraqi , under the influence of strong industrial activity . In order to asses the degree of contamination to which the population are consumed .

3-Materials and Methods :

3.1-Sample collection :

Yoghurt products were acquired in different market across the cities . They were selected depending on their acceptance and consumption by the population living in cities .

The study involve 8 types of yoghurt samples combined in to 8 groups contains 3 samples of similar company items as follows :
canon , Al-manfoush , mersin ,Al- Iraqi company , mik as cezir , bakk bosiongl and

al-batol company .

3.2-Biochemical analysis :

The crude protein , fat , lactose and pH were determined using Gerber method ⁽¹⁰⁾ , colorimetric method⁽¹¹⁾ and Gledile method ⁽¹²⁾. With using spectro photometer (LKB)

3.3-Minerals analysis :

copper , zinc and iron were determined using QuantichromTMcopper ^(13,14,15). Assay kit(DIFE-250) (DICU, 250) , QuantichromTM iron assay ⁽¹³⁾. kit (DIFE-250) With spectrophotometer (LKB) apparatus. Zinc was determined by(Kit) Bioassay system

3.4-Statistical analysis:

The results were obtained expressed as the mean \pm standard deviation (SD) . The correlation coefficient were calculated (P <0.05) were considered to be statistically significant .

4-Results and Discussion:

4.1 Protein Determination

The results of the proximate composition of the yoghurt samples are shown in table (1) figure (1). The protein content of yoghurt fermented was significantly higher ($p < 0.05$) in the all companies. Yoghurt proteins are high-quality and easily digestible proteins, because lactic bacteria partially digest them, yielding protein fragments (peptides) and amino acids. Yogurt proteins have a notably high proportion of lysine. The protein content in some yogurts is even higher than that of the original milk, due to the addition of milk powder during the manufacturing process⁽¹⁹⁾.

4.2-Lipid Determination:-

Shown table(1) figure(1) there was significant difference($p < 0.05$) in the lipid of yogurt fermented in the all companies. Also there was significant difference of the quality of milk used in yogurt manufacture company⁽¹⁹⁾. The fat proportion in yogurt varies depending on the fat content of the milk used to prepare much like milk and other whole dairies, yogurt contains mostly saturated fat⁽²⁰⁾.

4.3-Lactose Determination:-

Shown table (1) figure(1) there was significant difference($p < 0.05$) in the lactose content of yogurt between Iraq company for yogurt and milkase company than others companies. Due to the action of lactic bacteria during the fermentation process the amount of lactose(the typical carbohydrate in dairies) in yogurt is smaller than in milk. However addition of milk powder during yogurt making raises the amount of lactose. Yogurt lactose in the lactic acid. Thus, lactose reaches the in testiness almost completely digested, which facilitates absorption. Therefore, fermented milk

products, including yogurt are a healthy alternative for people suffering from lactose intolerance by lactase deficiency⁽²⁰⁾.

4.4-pH Determination:-

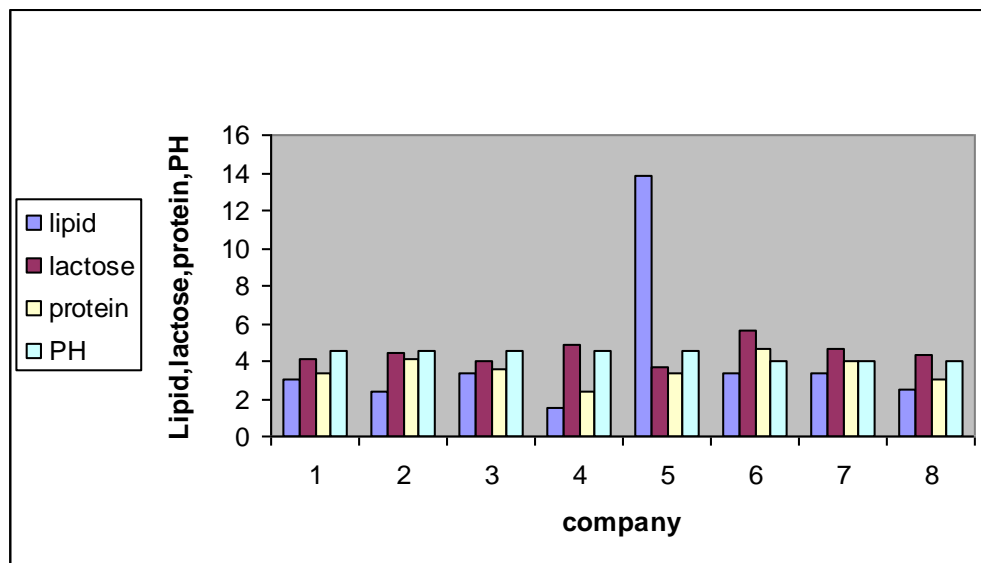
The pH of the yoghurt samples are shown in table (1) . The pH ranged from 4.5 to 4.0 in yoghurt there was no significant difference ($p > 0.05$) in the yoghurt samples in the all companies due to presence of acids as lactic acid .

4.5-Minerals Determination

Table (2) , figure (2) . Shows the concentration of different minerals determined in the yoghurt samples (ppm) for copper (cu) , Zinc (Zn) and iron (Fe) . In general the concentration obtained in this study showed Zinc as the element presenting the highest levels , also there was significant difference ($p < 0.05$) in the level iron, copper ($p < 0.05$) between milk as cezir company than other company . That's probably due to the milk used has been fortified with minerals⁽²¹⁾

Table (1):-Levels lipid, lactose ,protein and PH in the different yogurt samp

Company	Lipid% (mean±SD)	lactose% (mean±SD)	protein% (mean±SD)	pH (mean±SD)
Canon	3 ± 0.11	4.1 ± 0.29	3.3 ± 0.55	4.5 ± 0.7
Almanfoush	2.4 ± 0.64	4.4 ± 0.71	4.1 ± 0.22	4.5 ± 0.7
Mersin	3.3 ± 0.64	4 ± 0.52	3.6 ± 0.45	4.5 ± 0.7
Iraqi Company	1.5 ± 0.15	4.9 ± 0.84	2.4 ± 0.23	4.5 ± 0.7
Ceri	13.8 ± 3.2	3.7 ± 0.73	3.3 ± 0.91	4.5 ± 0.7
Milkas cezir	3.3 ± 1.2	5.6 ± 1.32	4.7 ± 1.52	4 ± 0.3
Bakkalbasiouglm	3.3 ± 2.2	4.7 ± 0.29	4 ± 0.39	4 ± 0.3
albatol	2.5 ± 0.16	4.3 ± 0.64	3 ± 0.14	4 ± 0.3



Figure(1):- Concentration of biochemical parameter in the yoghurt of companies

Table (2):- Levels of heavy metals in the different yoghurt samples (PPm)

Company	Cu(PPm) (mean±SD)	Fe(PPm) (mean±SD)	Zn(PPm) (mean±SD)
Canon	4.6 ±0.39	82 ±20	13 ±1.33
Almanfoush	4.7 ±0.4	83 ±21	13 ±1.33
Mersin	4.2 ±0.22	87 ± 15	15 ± 2.7
Iraqi Company	4.2 ±1.2	81 ±19	11 ± 2.9
Milkas cezir	4.4 ±1.9	89 ± 25	16 ± 4.5
Bakkalbasiouglm	4.1± 0.5	84 ± 15.9	15 ± 3.5

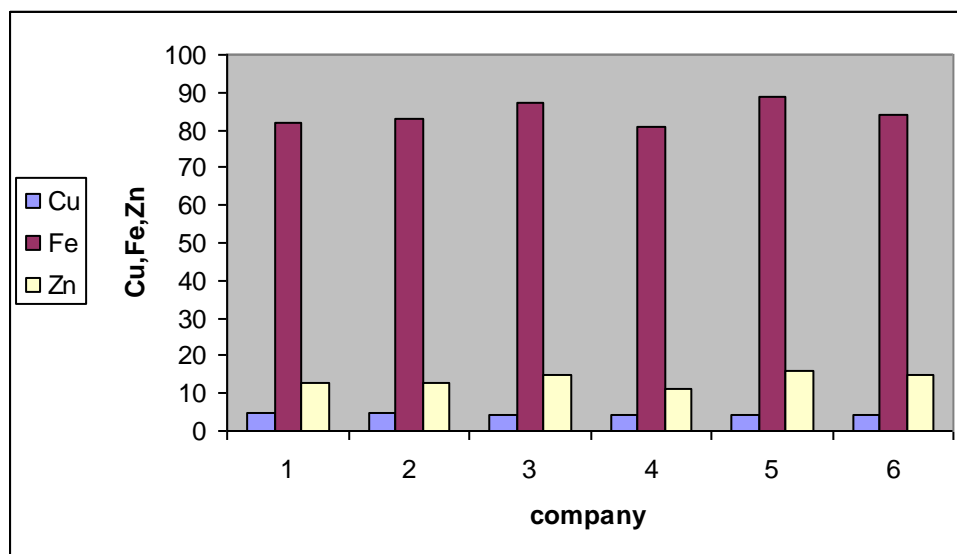


Figure (2) :- concentration of minerals in the yoghurt of companies
 1= conc. Of Cu
 2=conc. Of Zn
 3=conc. Of Fe

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دراسة وتقدير بعض المتغيرات البايوكيميائية والتلوث الصناعي في مصل اللبن الرائب الصناعي

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الخلاصة:-

يتضمن هذا البحث تقييم مستويات المعادن (الحديد، النحاس، الزنك) وبعض المتغيرات الكيمو حيوية (الدهون، اللاكتوز، بروتين، الدالة الحامضية) على نوعية اللبن الرائب. اخذنا 21 عينة من اللبن الرائب كسبعة مجاميع كل مجموعة تحتوي 3 عينات من اللبن الرائب طبقا الى منتوج الشركات التركية، العراقية، الايرانية والاردنية التي تم الحصول عليها من الاسواق المحلية. واستخدم مطياف الامتصاص الذري لتقدير المعادن ولتقدير المتغيرات الكيمو حيوية، جهاز الدالة الحامضية و الطريقة اللونية وطريقة كليدال. وظهرت النتائج مقارنة مهمة بين الدهون، اللاكتوز، وعناصر النحاس والحديد في جميع الشركات وفروقات معنوية بين البروتين والزنك.