

قسم المراقبة الصحية على الأغذية
كلية الطب البيطري - جامعة أسيوط
رئيس القسم : أ.د/ توفيق البسيوني

الحالة الصحية للزبادي في مدينة أسيوط

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تم فحص ٤٠ عينة من الزبادي المنتج محليا في مدينة أسيوط لفحصها بكتريولوجيا
لتحديد الحالة الصحية لانتاجيتها •

وقد أثبتت النتائج أن متوسط عدد الميكروبات القولونية والكروية المعويصة ،
والفطريات والخمائر هو 4×10^4 ، 3×10^4 ، 6×10^3 على التوالي بالإضافة الى
عزل عدد كبير من الميكروبات الممرضة وغير الممرضة •

وانتهى البحث الى أن وجود هذه الميكروبات بأعداد كبيرة دليل على الإهمال في
الاشتراطات الصحية الواجب توافرها أثناء تصنيع وتداول هذا المنتج •

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**SANITARY CONDITION OF COMMERCIALY AVAILABLE YOGHURT
IN ASSIUT CITY**
(With 2 Tables)

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SUMMARY

Fourty yoghurt samples were analysed for coliform, psychrotrophic, enterococcus and yeast and mold counts. The average values were 4×10^4 , 2×10^4 , 3×10^4 , and 6×10^3 , respectively. E. coli were present in 62.5% and anaerobes in 35% of yoghurts examined. Finally, the public health importance of the isolated organisms as well as recommended measures for proper yoghurt making was discussed.

INTRODUCTION

The great popularity of yoghurt is due to its refresing and thirst-quenching in hot weather. It is also considered more digestible than ordinary milk and particularly recommended for sick and convalescent people.

Microorganisms gain entry into yoghurt during various stages of manufacture and storage. Although its preparation is based on the development of acidity in amounts sufficient to inhibit putrefaction, a number of organisms are known to tolerate the high acidity and produce undesirable changes in the product.

The enumeration and viability results of different pathogens in yoghurt have been noted elsewhere (WAHBY and ROUSHDY, 1955; MOURSY, 1969; DINCHEVA, 1973; ARNOTT, *et al.* 1974; VARABIOFF, 1983 and GARCIA and FERNANDEZ, 1984).

MOURSY (1969) detected coliforms in 65% of yoghurt samples examined at variable titres ranging from 10^1 - 10^3 . E. coli could be detected from 55% of the examined samples. More recently, ARNOTT, *et al.* (1974) described the testing of 125 yoghurt samples and found that staphylococci, coliforms and enterococci were present in 27.6%, 15.8% of samples, respectively.

The keeping quality of yoghurt, therefore, depends upon the number and types of microflora present in it. The present study was undertaken to provide information on the number and types of microorganisms, claimed to be indices of pollution nad significant from the public health point of view, occuring in yoghurt available in Assiut City markets.

MATERIAL and METHODS

40 random samples of yoghurt were obtained from retail outlets in Assiut City. The samples were transferred to the laboratory without delay and examined as soon as possible after their

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arrival. Each sample, in its container as ready for sale, was thoroughly mixed by sterile stirrer before being subjected to the following analysis:

- 1- Determination of titratable acidity percentage (A.O.A.C., 1975).
- 2- Enumeration of coliforms and isolation of *E. coli* (MERCURI and COX, 1979).
- 3- Detection of anaerobes (CRUICKSHANK, et al. 1969).
- 5- Enumeration of psychrotrophs (A.P.H.A., 1978).
- 5- Enumeration of enterococci (ISHENBERG, et al. 1970).
- 6- yeast and MOLD count (HARIGAN and MARGARET, 1976).

RESULTS

The obtained results from the examined samples are recorded in Tables 1 & 2.

DISCUSSION

The results recorded in Tables 1 & 2 revealed that the maximum titratable acidity percent of examined yoghurt samples was 1.55% and the minimum was 0.26%, with an average of 1.097%. The highest frequency distribution (75.5) lied within the range of 0.56-1.15%. Nearly similar findings were reported by AL-ASHMAWY (1970) and DAWOOD (1975), while higher results were obtained by AHMED and EL-BASSIONY (1979).

The results summarized in Table 1 show that the great majority of the yoghurt samples (75%) were contaminated with coliform organisms to various extents varying from 3×10^3 to 5×10^5 /g with an average of 4×10^4 /g. These results were surprising when one considers that the data of DAVIS, et al. (1971) and GOEL, et al. (1971) indicated that yoghurt was not a good medium for coliforms. DAVIS, et al. (1971) found no coliforms in the samples he analysed whereas GOEL, et al. (1971) found that the numbers of coliforms introduced by inoculation decreased rapidly and where almost extinct after 4 days.

Levels of enterococci shown in Table 1 revealed that 60% of yoghurt tested had enterococci ranging from 2×10^1 to 9×10^7 with an average of 3×10^4 /g. Our results are higher than those reported by ARNOTT, et al. (1974).

The relatively high incidence of coliforms and enterococci is disturbing because it is considered to be indicative of unsanitary processing conditions. The high incidence of these organisms has also been reported by AHMED and EL-BASSIONY (1979).

Regarding isolation of *E. coli* and anaerobes, it is evident from Table 1 that 25(62.5) out of 40 yoghurt samples proved to contain *E. coli*, while anaerobes were present in 35% of examined samples. As both animal and man carry these organisms in their intestinal tracts, therefore, their presence in yoghurt is indicative of faecal pollution.

Psychrotrophs at levels ranging from 10^2 - 10^3 /g were found in 97.5% of yoghurts examined (Table 2). These organisms may produce proteolytic or lipolytic enzymes leading to decrease the keeping quality of the product. Furthermore, individual members of these bacteria have been implicated as a causal agents of food poisoning (HOBBS, 1975).

The yeast and mold analysis (Table 1) show that the maximum, minimum and average values were 5×10^4 , 3×10^2 and 6×10^3 /g, respectively. The presence of yeasts and molds in yoghurt also

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is indicative of poor sanitary practices in manufacturing or packaging. Moreover, many of these organisms are mycotoxin producers and constitute a public health hazard as the consumer does not always purchase yoghurt on the same day it was prepared. The appearance of yoghurts containing sugar, fruits and flavorings may improve yoghurt as a medium for growth of yeasts and molds. For these reasons fruits and flavorings added to yoghurt must be subjected to a rigorous quality control program as well as control of cultures and sanitation during processing.

The overall picture of yoghurt quality in Assiut City as measured by microbiological evaluation appears to indicate a need for emphasis on quality control during manufacture and storage.

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Table (1)
Statistical analytical results of microbiological analysis of examined yoghurt samples

Test	No. of exam. samples	No. of +ve samples	%	Min.	Count/g.		Average
						Max.	
TA	--	--	--	0.26 ₁	1.55 ₅		1.097 ₄
CC	40	30	75.0	3x10 ¹	5x10 ⁵		4x10 ⁴
E. coli	40	25	62.5	--	--		--
Anaerobes	40	14	35.0	--	--		--
PC	--	--	--	2x10 ² ₁	7x10 ⁴ ₅		2x10 ⁴ ₄
EC	40	24	60.0	2x10 ¹	9x10 ⁵ ₄		3x10 ⁴
YMC	--	--	--	3x10 ²	5x10 ⁴		6x10 ³

TA : Titratable acidity percentage
CC : Coliform count
PC : Psychrotrophic count

EC : Enterococcus count
YMC : Yeasts and Molds count

Table (2)
The highest frequency distribution of titratable acidity percentage, bacterial and yeast and mold counts in examined yoghurt samples

Test	Interval	%
Titratable acidity %	0.56 - 1.15	75.5
Coliforms count	10 ² - 10 ³	60.0
Psychrotrophic count	10 ² - 10 ³	97.5
Enterococcus count	10 ¹ - 10 ²	83.84
Yeasts and Molds count	10 ² - 10 ³	97.5

