

قسم : الصحة ومراقبة الأغذية - كلية الطب البيطرى - جامعة القاهرة .
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مدى تواجد الميكروب المنقودى الذهبى فى
الجبن الطرى

عبد العشاوى

جمعت ٢٠٠ عينة من الجبن الطرى من البائعين فى مدينة بغداد . وتم فحصها
لمعرفة نسبة تواجد الميكروب المنقودى الذهبى .

دلت النتائج على أن متوسط العد الكلى للميكروب 2888×10^5 / جم كما أتضح
أن ٥٢% من عينات الجبن الطرى تحتوى على أكثر من 10^6 / جم . ولم توجد علاقة أحصائية
بين عدد الميكروب ودرجة التركيز الايدروجينى فى العينات . وكانت عترات الميكروب المعزولة
ذات مقاومة عالية للمنسلين ، استربتومايسين ، وأمبسليلين ، وذات حساسية لكل من
جيراميسين ، تتراسيكلين ، ريفامبين وارثرومايسين .

وأظهرت عترات المستعمرات بيضاء اللون مقاومة عالية للمضادات الحيوية عن العترات الصفراء
الذهبية .

تم مناقشة الأهمية الصحية للميكروب المعزول - كما نوقشت الشروط الصحية الواجب توافرها
فى انتاج الجبن .

OCCURANCE OF COAGULASE-POSITIVE STAPHYLOCOCCI IN SOFT CHEESE

(With 5 Tables)

By

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SUMMARY

Two hundred samples of soft cheese, collected from different retailers in Baghdad City, were examined for incidence of coagulase-positive *Staph. aureus*.

The average count of coagulase-positive *Staph. aureus* per gram cheese was 28.88×10^5 . 52% of cheese samples proved to contain 10^6 /g coagulase-positive *Staphylococci*.

No correlation could be detected between pH value and the number of *Staph. aureus* in examined samples.

Isolated strains were highly resistance to Penicillin, Streptomycin and Ampicillin, while they were sensitive to Garamycin, Tetracyclin, Rifampin and Erythromycin. White colonies showed more resistance to antibiotics than golden-yellow colonies of isolated *Staph. aureus*.

The public health importance of isolated organisms as well as recommended hygienic measures for cheese making are discussed.

INTRODUCTION

The great majority of cheese produced in Iraq is the soft salted variety, which has the property of being palatable under normal storage conditions for many weeks in a brine solution. It is prepared from cow's, sheep's or goat's milk which is raw or inadequately heated. Therefore, serious problems of food poisoning outbreaks may arise among consumers. In Iraq, sporadic food poisoning cases have occurred in factories and hospitals following consumption of soft cheese, but no systematic work has been done to establish the incidence and role of enterotoxigenic *Staphylococci* in this connection. In view of the high incidence of *Staphylococcal* mastitis in cows, sheeps and goats (KAPLAN *et al.*, 1962 and ABDEL-KARIM & EL-ASHMAWY, 1979), the low standard of sanitation in the production and handling of milk and milk products, besides the environmental condition that favours the growth of existing *staphylococci* during storage, render the cheese unsafe for consumption due to performed enterotoxin.

The present investigation aimed to throw light on the incidence of coagulase-positive *Staphylococci* in soft cheese marketed in Baghdad and to study sensitivity of isolated strains to antibiotics.

MATERIAL and METHODS

Two hundred samples of soft cheese, collected from different retailers in Baghdad city, were examined for enumeration of coagulase-positive *Staph. aureus* using egg yolk salt medium. Suspected colonies were confirmed by coagulase test (AOAC, 1970). Isolates were further identified according to COWAN and STEEL (1970). Sensitivity of isolates to 9 antibiotics were determined according to BLAIR *et al.* (1970).

The pH value of each sample was determined by using Pye Potentiometer (Model 293, PYE).

RESULTS

Tables 1-5 showed the obtained results.

DISCUSSION

The results reported in table (1) reveal that the average count of coagulase-positive *Staph. aureus*/g cheese was $28.88 \times 10^5 \pm 5.19 \times 10^5$ ($3.9 \times 10^3 - 6.7 \times 10^7$). The count of golden-yellow colonies of *Staph. aureus* ranged from 10^2 to 3.7×10^7 , with a mean value of $10.8 \times 10^5 \pm 3.1 \times 10^5$. Frequency distribution of examined

samples showed that 52% of cheese samples contained coagulase-positive *Staph. aureus* $>10^6$ /g (Table 2).

Incidence fo coagulase-positive Staphylococcal count in soft cheese were reported by BIRZU *et al.* (1968); IENISTEA *et al.* (1971); GHAZVINIAN *et al.* (1975) and HELMY *et al.* (1975).

Some investigators stated that presence of coagulase-positive Staphylococci to a levels of one million per gram cheese results in production of detectable amount of toxins in cheese (CASHAN & BENNETT, 1965 and TATINI *et al.*, 1970). Therefore, most of examined samples of cheese should be looked upon with suspicious as constituting a potential health hazard.

Moreover, statistical analysis of results showed that no correlation between the pH value and Staphylococcal count in examined samples exists. This finding agrees with those reported by WALKER *et al.* (1961).

The findings reported in table (3) show that isolated golden-yellow colonies of *Staph. aureus* induced mostly beta-haemolysis, while the white colonies produced mainly alpha-haemolysis or being non-haemolytic.

It has been reported that beta-haemolysis is associated with strains of bovine origin, while that of human strains produce predominantly alpha-haemolysis (EDWARD & PIPPON, 1957; PARISI & BALDWIN, 1963 and MARHAM & MARHAM, 1966).

It worth mentioning that most of isolated white colonies reacted positively to coagulase test. A finding that substantiate what has been reported by MUTH (1971).

It is evident from the results given in tables (4&5) that isolated strains of coagulase-positive Staphylococci were highly resistance to Penicillin, Streptomycin and Ampicillin, but they were more sensitive to Garamycin, Tetracyclin, Rifampin and Erythromycin, This finding coincides with that reported by PERTICA *et al.* (1968); LUKASOVA (1969); KUSCH *et al.* (1972) and DEVOYOD & MILLET (1974). Isolated white colonies of Staphylococci showed increased resistance to antibiotics than the golden-yellow colonies.

MAYER(1975) reported that toxin production was much more frequent among the antibiotics-resistant strains.

To control Staphylococcal enterotoxin gastroenteritis, it is difficult to ensure the complete exclusion of the organism in cheese as staphylococci are ubiquitous in nature. The main efforts should be directed towards preventing the multiplication of contaminating Staphylococci, thus decreasing enterotoxin production. Milk should be cooled as soon as possible to 10°C or below until processed. Workers with sinus infections or recurrent boils or colds should be prevented from sharing in processing or handling dairy products. In conclusion, strict hygienic measures should be adopted during manufacturing, handling and storage of dairy products.

Table (1): Statistical results of staphylococcal count/g and pH value in the examined samples

	Min.	Max.	Mean±S.E.M.
pH value	5.0	6.8	6.16 ± 0.0717
Count of coagulase positive staphylococci	3.9×10^3	6.7×10^7	$28.88 \times 10^5 \pm 5.19 \times 10^5$
Count of golden-yellow colonies.	10^2	3.7×10^7	$10.80 \times 10^5 \pm 3.10 \times 10^5$

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Table (2): Frequency distribution of staphylococcal count/g in examined samples

Range	Total No. of coagulase-positive staphylococci		Golden-yellow colonies of Staph. aureus	
	No. of samples	%	No. of samples	%
$10^2 - 10^3$	-	-	5	2.63
$10^3 - 10^4$	2	1.00	38	20.00
$10^4 - 10^5$	19	9.50	69	36.32
$10^5 - 10^6$	75	37.50	57	30.00
$10^6 - 10^7$	92	46.00	15	7.90
$10^7 - 10^8$	12	6.00	6	3.15
Total	200	100.00	190	100.00

Table (3): Comparison between coagulase-positive strains of Staph. aureus isolated from cheese

	No. of isolates	Phosphatase		B-Haemolysis		Haemolysis		non-haemolytic	
		No.	%	No.	%	No.	%	No.	%
Golden-yellow colonies	156	112	71.79	50	32.05	79	50.64	27	17.31
White colonies	159	106	66.67	25	15.72	90	56.61	44	27.67
Total	315	218	69.20	75	23.81	169	53.65	71	22.54

Table (4): The incidence of the sensitive and resistant strains of Staph. aureus (golden-yellow colonies) to antibiotics

Antibiotic agent.	Disk potency	Resistant strains		Sensitive strains			
		No.	%	S	M	Total	%
Tetracyclin	5 mcg	30	19.23	117	9	126	80.77
Ampicillin	10 mcg	42	26.92	87	27	114	73.08
Rifampin	5 mcg	30	19.23	122	4	126	80.77
Dihydrostreptomycin	10 mcg	67	42.95	49	40	89	57.05
Erythromycin	15 mcg	17	10.90	127	12	139	89.10
Streptomycin	10 mcg	59	37.82	57	40	97	62.18
Garamycin	30 mcg	21	13.46	128	7	135	86.54
Ampicillin	2 mcg	62	39.74	78	16	94	60.26
Penicillin	10 mcg	58	37.18	98	-	98	62.82

S: Susceptible.

M: Moderately Susceptible.

Table (5): The incidence of the sensitive and resistant strains of Staph. aureus (white colonies) to antibiotics

Antibiotic agent	Disk potency	Resistant strains		Sensitive strains			
		No.	%	S	M	Total	%
Tetracyclin	5 mcg	34	21.38	116	9	125	78.62
Ampicillin	10 mcg	71	44.65	69	19	88	55.35
Rifampin	5 mcg	38	23.90	121	-	121	76.10
Dihydrostreptomycin	10 mcg	75	47.17	45	39	84	52.83
Erythromycin	15 mcg	57	35.85	95	7	102	64.15
Streptomycin	10 mcg	67	42.13	53	39	92	57.87
Garamycin	30 mcg	37	23.27	117	5	122	76.73
Ampicillin	2 mcg	83	52.20	76	-	76	47.80
Penicillin	10 mcg	83	52.20	70	6	76	47.80

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