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دراسة عن ميكروب المكور المنقودى الذهبى فى

اللحم المفرى

سوسن رشدى ، فؤاد صديق ، محمود زيدان \*

تناول البحث دراسة مدى تواجد ميكروب المكور المنقودى الذهبى فى عينات عشوائية  
جمعت من أسواق الجيزة .

Milk salt & Baird Parker

واستعمل الباحثون نوعين من المنابت

للمقارنة بينها فى عزل البثرات المسببة للتسمم الغذائى بعد إجراء التجارب المؤكدة

Thermostabel nuclease, coagulase

لذلك .

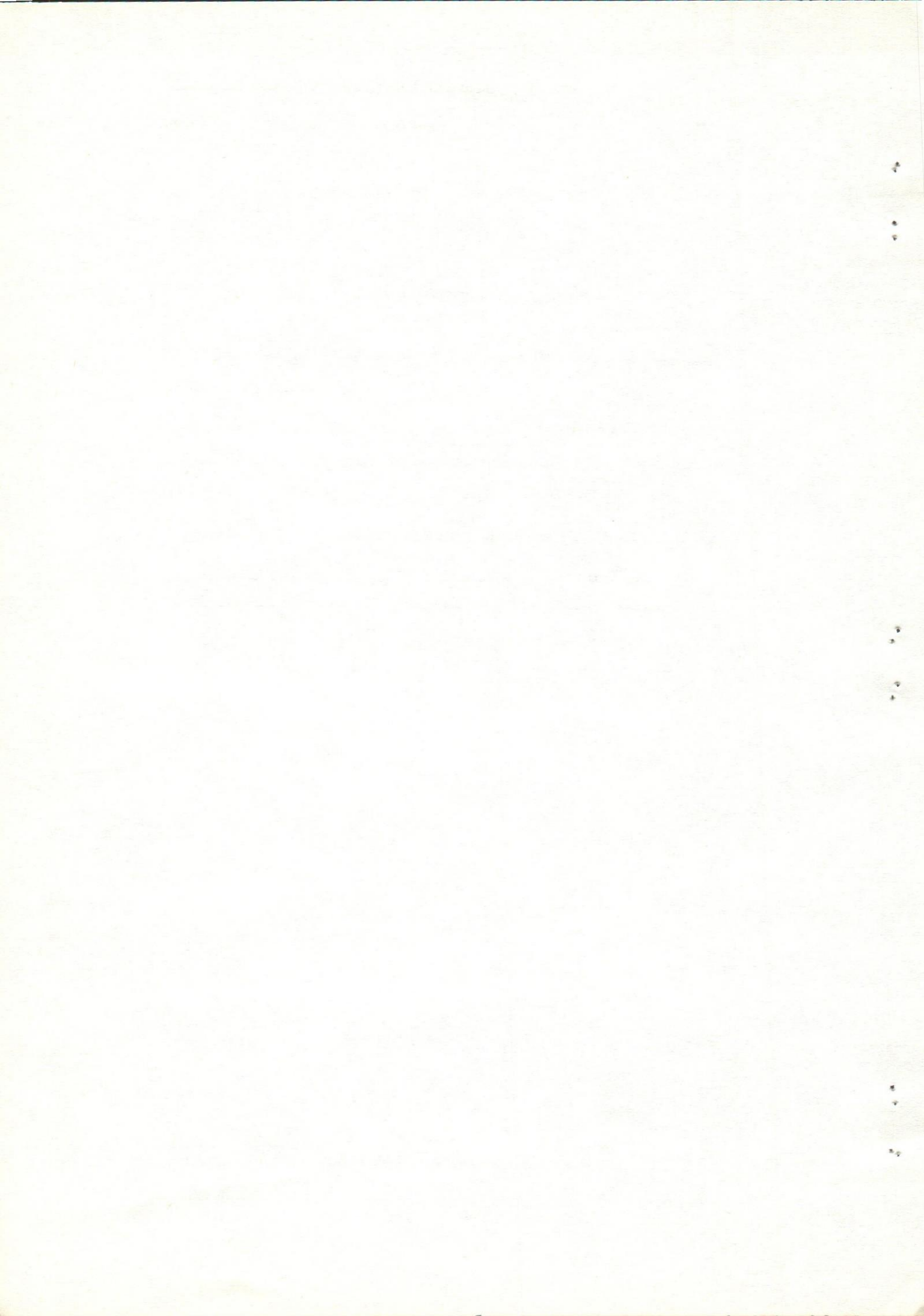
ودلت النتائج على أن درجة التلبد  $37^{\circ}\text{C}$  يجب أن تغرز باختبار لتقرير سمية الميكروب

هذا وقد تواجد الميكروب فى جميع العينات بمتوسط عددى  $12 \times 10^3$  - الى  $84 \times 10^6$

وقد ناقش الباحثون النتائج وما يرون اتخاذه من اجراءات صحية لحماية المستهلك .

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## STAPH. YLOCOCCUS AUREUS IN MARKET MINCED MEAT (With One Table)

By

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### SUMMARY

Fifteen random samples of minced meat were collected from different districts in Giza. Each sample was bacteriologically examined to detect and indentify enterotoxigenic Staph. aureus.

Higher presumptive counts could be obtained on Milk Salt medium, but Baird Parker medium proved to be more selective and sensitive for isolation of enterotoxigenic Staph. aureus.

Staph. showing a degree  $\leq$  "2" coagulase reaction should be confirmed by thermoun-  
-lease test before being considered enterotoxigenic.

Suggested measures to safe-guard minced meat consumers were discussed.

### INTRODUCTION

Bacterial food poisoning is among the ailments from which man still suffers. Staphylococcus food intoxication is most commonly occurring allover the world, as the organism is wide spread in nature and hence the rate of direct or indirect food contamination is high (WARING 1952; CASMAN *et al.* 1967; and THATCHER and CLARK 1978).

Although food poisoning is not a reportable disease and most cases go unrecognised; yet staphylococcal intoxication outbreaks occur frequently specially in developing countries where food hygiene is still under-way. Many foods have been implicated in staphylococcus food poisoning. (DONNELLY *et al.* 1963; SINELL, 1971; BRYAN, 1972; DEMPESTER and CODY, 1973; EL BASSIONY, 1977; NISKANEN 1977 and MULLER, 1978).

Minced meat is a most popular food article in our country.

As the product is subjected to contamination with Staph. aureus from different sources during its preparation, handling or storage; thus it may at times be increminated in cases of food poisoning outbreaks.

This work was planned to take the form of a comparative assey in which the incidence and count of Staph. aureus, in amounts liable to induce food poisoning was determined as well as to study the efficiency of Baird Parker and Milk Salt media for detection of enterotoxigenic Staph. aureus as confirmed by coagulase and thermos-  
-table nuclease tests. (ANCELOTTI, 1969; LUQUET, 1970; HANS *et al.* 1974; AHMED, 1980 and EZZAT 1980).

### MATERIAL and METHODS

Fifteen random samples of minced meat, collected from Giza markets, were transferred to the laboratory with minimum of delay. These samples were bacteriologically examined according to the technique recommended by THATCHER and CLARK (1978).

#### Preparation of samples:

10 g. of each sample were homogenised with 90 ml. of 0.1% peptone in blender for 2 minutes at high speed. Decimal dilutions of the homogenate were prepared.

#### Presumptive count:

0.1 ml. of selected dilutions was seeded, in duplicate, on two predried surfaces of Baird-Parker and Milk Salt Agar plates. Suspected colonies were counted, on both media, after 24 and 48 hours incubation at 37°C.

The average presumptive count/gm. minced meat was calculated and recorded.

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Confirmed Count:

Five suspected colonies, from each media, were inoculated into 5 ml. of Brain Heart Infusion broth and incubated at 37°C for 18 hours (over night), before being examined as follows:

- 1- Microscopical examination.
- 2- Coagulase test:

The extent of reaction was determined by using rabbit coagulase plasma after 20 hours at room temperature

- 3- Thermostable nuclease test:

The remainder of the BHI culture was placed in a boiling water bath for 15 minutes. Wells in Toluidin Blue-DNA agar were filled with the heated culture, then incubated in a moist chamber at 37°C for 4 hours before being examined.

## RESULTS

Results obtained were recorded in table (1).

Average count of Staph. aureus recovered on both media.

Sample No.	Staphylococci count/g. minced meat.			
	Presumptive		Confirmed	
	B.P.	M.S.	B.P.	M.S.
1	97x10 <sup>3</sup>	14x10 <sup>4</sup>	19x10 <sup>3</sup>	----
2	29x10 <sup>3</sup>	36x10 <sup>3</sup>	48x10 <sup>2</sup>	----
3	61x10 <sup>3</sup>	61x10 <sup>3</sup>	12x10 <sup>3</sup>	----
4	29x10 <sup>3</sup>	38x10 <sup>3</sup>	58x10 <sup>2</sup>	----
5	32x10 <sup>3</sup>	38x10 <sup>3</sup>	28x10 <sup>2</sup>	----
6	38x10 <sup>3</sup>	44x10 <sup>3</sup>	22x10 <sup>3</sup>	11x10 <sup>3</sup>
7	25x10 <sup>3</sup>	24x10 <sup>3</sup>	5x10 <sup>3</sup>	----
8	12x10 <sup>4</sup>	16x10 <sup>4</sup>	24x10 <sup>3</sup>	----
9	37x10 <sup>3</sup>	58x10 <sup>3</sup>	14x10 <sup>3</sup>	11x10 <sup>3</sup>
10	48x10 <sup>3</sup>	84x10 <sup>4</sup>	19x10 <sup>3</sup>	----
11	25x10 <sup>3</sup>	41x10 <sup>3</sup>	10x10 <sup>3</sup>	82x10 <sup>2</sup>
12	60x10 <sup>3</sup>	62x10 <sup>4</sup>	12x10 <sup>3</sup>	----
13	34x10 <sup>3</sup>	55x10 <sup>3</sup>	13x10 <sup>3</sup>	11x10 <sup>3</sup>
14	24x10 <sup>3</sup>	37x10 <sup>4</sup>	96x10 <sup>2</sup>	----
15	12x10 <sup>3</sup>	22x10 <sup>4</sup>	72x10 <sup>2</sup>	----

B.P. = Baird Parker agar.

M.S. = Milk Salt agar.

## DISCUSSION

It is evident from the results achieved that coagulase positive staphylococci could be isolated from all samples of minced meat examined. Their number ranged from 12x10<sup>3</sup> to 12x10<sup>4</sup>/g. on Baird Parker medium. Comparatively higher counts were obtained on Milk salt agar. Such counts were considered presumptive.

Organisms proving to be coagulase positive were confirmed by thermostable nuclease test. From the results obtained it is evident that all colonies recovered from Baird Parker medium showed a positive thermostable nuclease reaction, while only 26.7% of those recovered from Milk Salt medium reacted positively. Therefore, Baird Parker medium proved to be more specific and sensitive than Milk Salt medium. Similar findings were reported by AHMED (1980) and EZZAT (1980).

It was also noticed that a degree  $\leq 2^+$  coagulase reaction showed negative reaction to thermostable

## STAPHYLOCOCCUS AUREUS, MINCED MEAT

nuclease test.

As no single property is an absolutely reliable index of enterotoxigenicity of *Staph. aureus*; and from the results achieved it seems essential that a degree  $\leq$  "2<sup>+</sup>" coagulase reaction should be supported by a positive thermoneuclease test before being considered enterotoxigenic. A finding that substantiates what has been reported by LUQUET (1970); HANS *et al.* (1974), AHMAD (1980) and EZZAT (1980).

The exceptional high incidence of enterotoxigenic *Staph. aureus* in market minced meat is attributed to sanitary neglected measures during preparation and handling of the product. Moreover, contaminated ingredients and additives added to already present contaminants.

In contrast to other enterotoxins performed in food stuffs, staphylococcal enterotoxin is thermostable and thus can withstand frying or even boiling of contaminated minced meat (WARING, 1952 and BERGDOLL, 1967, 1972). To safe-guard minced meat consumers from staph. food poisoning, efforts should be made to prevent its contamination during its preparation, rapid refrigeration of the product, control of human carriers in critical points in processing, distribution circuits and kitchens as well as maintenance of hygiene standards during processing and handling of the product.

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