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BACTERIOLOGICAL EVALUATION OF CHICKEN LUNCHEON IN ASSIUT CITY

(With 4 Tables)

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التقييم البكتريولوجى للاتشون الفراخ فى مدينة أسيوط

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تـم جمـع عدد ٣٠ عينة من لانشون الفراخ من محلات مختلفة فى مدينة أسيوط تحت الظروف الملائمـة والاشـتراطات الصحية اللازمة لوصول هذه العينات إلى المعمل فى حالة جيدة تسمح بالقـيام بـالفحص الظاهـرى والبكتريولوجى عليها. وباستخدام الطرق الحسية المختلفة للفحص الظاهـرى وجـد أن هـذا المنـتج مقـبول مـن حيث الفحص الظاهرى. أما بالنسبة للفحص البكتريولوجى أوضحت النتائج أن متوسط العدد الكلى للميكروبات الهوائية والميكروبات المعوية وكذلك المكور العنقودى الذهبى هو ١٤×١٠^{٤} ، $٨,٨\times١٠^{٤}$ ، $١٣,٧\times١٠^{٣}$ فى الجرام الواحد على الـتوالى. وقد أمكن عزل الميكروبات الآتية: عدد ١٨(٢٥,٧%) عترة انتيروباكتر كلواكى، ٢١ (٣٠%) عـترة سيتروباكتر فروندياى، ١٦ (٢٢,٨%) كلبسيله رئوية وأخيرا عدد ١٥(٢١,٤%) عترة بروتياس فالجارس وكذلك تم عزل ٢(٦,٦%) عترة سالمونيله تم تصنيفها إلى ١ (٣,٣%) سـالمونيله تيفـيه فأريـة ، ١ (٣,٣%) سـالمونيله تيفيه وقد تمت مناقشة الأهمية الصحية لهذه الميكروبات ومدى خطورتها على الصحة العامة.

SUMMARY

Thirty samples of chicken luncheon were collected from different shops and supermarkets in Assiut City. The samples were examined for their organoleptic and bacteriological quality. All the examined samples were accepted organoleptically and found to be contaminated with different types of microorganisms. The mean values of total aerobic plate count, *Enterobacteriaceae* and *Staph.aureus* counts were $14x10^4$, $8.8x10^4$ and $13.7x10^3$/g of the examined chicken luncheon samples respectively. The *Enterobacteriaceae* which could be detected in the examined chicken luncheon were 18(25.7%) *Enterobacter cloaecae* 21(30%) *Citrobacter*

freundii., 16(22.8%) *Klebsiella pneumoniae.*, and 15(21.4%) *Proteus vulgaris* . Also 2 (6.6%) strains of *Salmonella* were serotyped as *Salmonella typhimurium* 1(3.3%) and *Salmonella typhi* 1(3.3%). The hygienic importance of the isolated organisms were discussed.

Key words: *Microorganisms, chicken luncheon, poultry meat products.*

INTRODUCTION

Poultry meat products comprise a substantial portion of the human diet. Clearly, the continual growth and prosperity of the poultry industry will depend, in large measure, on its ability to supply the consumer with wholesome and safe products. However, the presence of pathogenic and/or spoilage microorganisms in poultry products remain a significant concern (Roberts, 1988 and Todd, 1989).

Total bacterial numbers and other counts have been used not only as indices of safety, but more important, as indicative of the sanitary conditions under which the food product has been prepared and the care the product has recived (Fanelli *et al.*, 1965).

Salmonella was selected as the largest pathogenic microorganism because it is one of the most common causes of food poisoning, is present at varying frequencies on all types of raw meat and poultry products, and can be easily analysed in a variety of products (Rose *et al.*, 2002). Poultry and poultry products are a common vehicle of food borne illness. Microbial risks associated with raw poultry prodcuts include *Salmonella* spp., Out breaks involving large numbers of people are usually caused by *Salmonella* (Uyttendaele, *et al.* 1999).

Staph.aureus is important in relation to poultry meat hygiene because of its ability to produce enterotoxins, which may cause food poisoning in human. Staphylococcal food poisoning is one of the major causes of foodborne illness, Jablonski and Bohach (1997). In 1989, the estimate of the incidence of food borne diarrheal disease caused by *Staph.aureus* food poisoning in the United States was 24 million or more cases per year, Doyle and Padhye (1989).

The main purpose of this study was to determine the presence of aerobic total bacterial counts, *Enterobacteriacae* and *Staph.aureus* in chicken luncheon samples collected from supermarkets at Assiut City, and to identify a relationship between total bacterial counts and above mentioned pathogens.

MATREIAL and METHODS

Collection of samples:

A total of 30 random samples of chicken luncheon were collected from different shops and supermarkets at Assiut City. All samples were aseptically packaged and transferred as quickly as possible to the laboratory for organoleptic and bacteriological examination.

I- Organoleptic examination: According to National Academy of Sciences (1985).

The sample was freed from its package to evaluate the appearance, odour and consistancy. Other defects that may be present were noted and recorded.

II- Bacteriological examination:

1- Preparation of samples:

Ten grams portions of each sample were added to 90 ml of sterile 0.1% peptone water in a sterile morter. The sample was grinned for 3 minutes. Ten fold serial dilutions from the original dilution (10^{-1}) were made and then the bacteriological analysis was performed.

2- Aerobic plate count: (APC)

Standard plate count agar was used for the aerobic plate count according to American Public Health Association (A.P.H.A., 1972).

3- *Enterobacteriaceae* count:

0.1ml of each dilution was plated on violet red bile glucose agar according to Mercuri and Cox (1979). Biochemical tests were done on the isolated colonies according to Edward and Ewing (1972).

4- *Staphylococcus aureus* count: (Baird-Parker, 1962):

Over a dry surface of Baird-Parker (B-P) agar plates (Duplicated plates were used), 0.1 ml amount from each of the prepared dilutions of samples under investigation was transferred and evenly spread using surface plating technique (Tatcher and Clark, 1975).

Coagulase test was carried out according to Cruickshank, *et al* (1975).

5- Isolation and Identification of *Salmonella* .

One gram portion of each sample was inoculated into 20 ml selenite cystine broth and incubated at 37°c for 18-24 h. After incubation a loopfull was streaked on SS agar (Difo). Suspected Salmonella colonies were further identified biochemically and serologically according to Cruickshank, *et al.* (1980).

RESULTS

Table 1: Frequency distribution of the examined chicken luncheon according to their organoleptic examination.

Type of Examined samples	Appearance		Odour		Consistancy	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
Chicken luncheon	30	-	30	-	30	-
Percentage	100		100		100	

Table 2: *Aerobic plate* count, *Enterobacteriaceae* and *Staph.aureus* counts of the examined chicken luncheon samples/g.(n=30)

Types of organisms	Minimum	Maximum	Mean
Aerobic plate count	$26x10^2$	$15x10^5$	$14x10^4$
Enterobacteriaceae count	$9x10^2$	$14x10^5$	$8.8x10^4$
Staph.aureus count	$6x10^2$	$12x10^4$	$13.7x10^3$

Table 3: *Enterobacteriacae* organisms isolated from chicken luncheon samples.

No. of examined samples	+ve samples		No. of strains isolated	Types of *Enterobacteriacae* organisms							
	No.	%		*Enterobacter Cloaecae*		*Citrobacter Freundii*		*Klebsiella Pneumoniae*		*Proteus Vlgaris*	
30	23	76.6	70	No.	%	No.	%	No.	%	No.	%
				18	25.7	21	30	16	22.8	15	21.4

Table 4: Types of *Salmonella* organisms isolated from chicken luncheon.

No. of examined samples	Positive samples		Types of *Salmonella* in chicken luncheon			
			S.typhimurium		*S.Typhi*	
30	No.	%	No.	%	No.	%
	2	6.6	1	3.3	1	3.3

DISCUSSION

Many foods microoganisms of importance in relation to poultry Products include the non Pathogenic spoilage type, as well as pathogens which are capable to cause food borne disease (Cunningham and Cox, 1987 and Bean *et al.*1990)

From the summarized results given in table (1). It is considered that all the examined chicken luncheon samples were organoleptically accepted.

The APC of the examined chicken luncheon samples varied from $26x10^2$ to $15x10^5$ with an average of $14x10^4$/g (table 2). The obtained results were nearly similar to those obtained by Mousa *et al.* (2001) and Farag (2004) Attention must be paid to sanitation and personal hygiene to minimize the contamination of broiler meat and its products (Vorster *et al.*1994)

Chordash and Insalate (1978) concluded that the *Enterobacteriaceae* are considered as spoilage agent when present in high number and may cause problems for consumer from the public health point of view.

Results achieved in table (2) declared that the *Enterobacteriacae* couuts of the chicken luncheon Samples ranged from $9x10^2$ to $14x10^5$ with a mean value of $8.8x10^4$/g .The results recorded in this work were in accordance with that reported by Farag (2004) and Cunninghan and Cox (1987).

Incidence of different *Enterobacteriaceae* isolated from the examined chicken luncheon samples were *Enterobacter cloaecae*, (25.7 %) *Citrobacter freundii*, (30%) *klebsiella pneumoniae* (22.8 %) and *Proteus vulgaris* were (21.4 %). In general, many species of *Enterobacteriaceae* have been reported to cause health hazards to consumers as well as other species may cause spoilage of meat which lead to economic loses. (Ban Wart.1981).

Food poisoning from multiplication of *Staph. aureus* in poultry meat relatively rare and generally come from the human food handler (Barnes, 1972).

It is evident from the results presented in table (2) that counts of *Staph.aureus* in chicken luncheon samples ranged from $6x10^2$ to $12x10^4$ with a mean value of $13.7 x10^3$ /g. The obtained results were realy similar to those obtained by Vorster *et al.*, (1994), Joblonski, and Bohach (1997) and Farag (2004).

Food borne illness from Staphylococcal enterotoxins remains a major problem world wide, (Bergdoll 1989). On the other hand, the *Staph.*

aureus isolated from human source may be considered the most dangerous strains of public health significance (Isigidi *et al.* 1992).

Results recorded in table (4) showed that the isolated *Salmonella* organisms could be serotyped into two organisms, one *Salmonella typhimurium* (3.3%) and the other one *Salmonella typhi* (3.3%).

Salmonella organisms were isolated from 20% of broilers meat, (Rose, 2002) and 19% from chicken carcace, (Garcia *et al.* 2003).

However, the percentage of *Salmonella* positive samples of poultry products varied from 12.8 to 79% (D' Aoust 1989).

Therefore to obtain a high quality chicken luncheon, treatment and added natural spices should be of good quality. Also hygienic procedures and measures should be adopted during processing, cooling, packaging process and storage.

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