INCIDENCE OF SALMONELLA IN RETAILED POULTRY CARCASSES AND ITS PRODUCTS ON THE SHARKIA MARKETS

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ABSTRACT

A total of 150 poultry meat product samples (50 each of Kofta, Luncheon and minced meat) and 400 freshly slaughtered poultry Parts (50 each of Breast, Cloaca, Wings, Neck, Liver, Gizzard, Thigh and Skin), were randomly collected from Sharkia supermarkets and examined bacteriologically for salmonella and enteric bacteria. The results declared that, salmonella Could not be isolated in the present study. The incidence of enterobacteriacaea were 42, 40 and 62% in the examined kofta, Luncheon and minced meat respectively Meanwhile such microorganisms were detected in the examined breast, coloaca, gizzard , liver , neck, skin, thigh and wings with a rates of 22,40,26,36,32,44,28 and 32% consequently Citrobcter freundii, E.Coli, Enterobacter spp., Klebstella, proteus vulgaris, Proteus merabilis, shigella flexneri, Shigella Sonnie and pseudomonas spp.were isolated and identified from the examined samples

The public health significance of isolated bacteria as well as suggestions for improving poultry processing and meat quality were discussed.

INTRODUCTION

The overgrowth of poultry production to meet the increasing demands of the consumers had necessitated the establishment of a hygienic poultry processing plants capable of providing the safe and high quality products.

Poultry and poultry products are a common vehicle of food borne illness. Microbial risks associated with raw poultry product include salmonella species and other Enterobacteriacaea. **(Bryan and Doyle, 1995)**.

Salmonellae and Campylobacters are by far the most important pathogens associated with poultry products, **(Schmidt, 1998)**.

Pseudomonas organisms were the predominant bacteria on poultry meat at the onset of

its refrigeration spoilage, especially pseudomonas fragi and pseudomonas lundensis **(Rollier 1998)**.

Therefore, the present work was designed to study the role of retailed poultry carcasses and poultry products in transmission of salmonellosis and Enterobacteriacae to consumers at Sharkia markets.

MATERIALS AND METHODS

I. collection of samples :

A total of 150 frozen chicken products consists of chicken kofta, chicken luncheon and minced meat (50 of each product) and 400 samples of chicken parts (50 samples of each) includes Breast, cloaca, wings, Neck, liver, gizzards, thigh and skin were collected from different supermarkets in Sharkia Governorate.

II. Preparation of samples :

The sample were aseptically transferred to the laboratory with a minimum of delay. Frozen sample were allowed to thaw at room temperature and were immediately subjected to bacteriological examinations.

III. Isolation and identification of salmonella species :

For salmonella isolation, twenty-five grams of each sample were cut into pieces and placed in sterile polyethylene bag to which 225 ml of buffered peptone water were added aseptically then incubated at 37°C for 15 hours **(Edel and Kampelmacher 1973)**. 0.1 ml of the pre-enrichment culture was transferred to 10 ml of both Rappaport vassiliadis enrichment broth **(Rappaport et al., 1956 & Harvey and Price, 1981)** and selenite - F- broth **(Harvey and price, 1981)** The tubes were then incubated at 43°C for 18 24 hours. Modified Brilliant green agar (MBG) and MacConkey agar (MA) plates were inoculated from enrichment broth and incubated at 37°C for 24 hours. Suspected colonies were picked up and isolated in pure cultures. The isolates were further identified morphologically and biochemically according to **(koneman et al., 1994 and Quinn et al., 1994)** The isolates that produced biochemical reactions simulating salmonella were subjected to serological identification as described by **Edward and Ewing (1972) and kauffman (1972)**.

IV : Isolation and identification of other Enterobacteriaceae :

Isolation and identification of other Enterobacteriacea were carried out according to Cruickshank **et al., (1975)**, and **Holt et al. (1996)**

RESULTS AND DISCUSSION

The delivered results in tables (1 & 2) revealed that salmonella organisms could not be detected in the examined chicken samples. These findings agreed with the results obtained by **Refaie and Nashed (1995)** who failed to isolate salmonella from 40 minced meat and 20 luncheon samples as well as with the results obtained by **Amal and Seham (1998)** who failed to isolate salmonella organisms from a hundred random samples of meat and chicken products including 40 samples of luncheon, 30 minced meat samples and 30 frozen chicken quarters.

The results obtained also disagreed with those reported by **Safwat et al., (1985)** who isolated salmonella in a ratio of 9.05% in chicken meats and with the results obtained from **Shahata (2000)** who isolated 21 isolates of salmonella microorganisms from three hundred samples of frozen poultry products including chicken breasts, chicken bread, chicken nuggets, chicken breasts, chicken balls and chicken minced meat. The failure to isolate salmonella from raw broiler chicken parts was also disagreed with **Yan (2000)** who detected salmonella spp-in a percentage of 25.9% out of 27 raw broiler samples.

This failure to isolate salmonella species from all examined samples may be due to the presence of high number of contaminants of other enterobacterial species esepecially proteus which overgrowed on the expanse of salmonella microorganism so decreased or even eleminated the propability for salmonella isolation. Regarding to table (1), it was noticed that there were a higher percentages of contaminated Enterobacteria in the minced meat (62%) than that isolated from the other examined chicken products (40% from kofta and 42% from luncheon) and this may be due to the presence of some food additives and preservatives in these products which may affect the microbial load on these products. From tables (1) and (2) it was noticed that the isolation percentage of Enterobacterial species was higher in case of chicken products species than that from chicken parts and these may be due to unhygienic measures during the processing and production as well as neglected hygienic supervision of the tools, workers, preservation and other production stages which is more prolonged in case of chicken products than chicken parts.

Also there was a wide range of Enterobacterial microorganisms isolated from both chicken products and parts including citrobacter spp, E. coli, Enterobacter spp., Klebsiella spp , Proteus spp., Shigella spp. And also Gram -negative microorganisms (Pseudomonas spp.). These results

agreed with **turtura (1991)** who investigated the microbial contamination of poultry samples from slaughter house and found that 34% of the samples were contaminated by Coliform bacteria at a level higher than 10 c.f.u./ml and out of 369 strain isolated 259 were coliforms and were identified as citrobacter freund II (66) . E. coli (65). Enterobacter agglomerans (63) and the less frequent strains were of the generea klebsiella (42), serratia (21), proteus (3), shigila sonnei (2) and a group of 42 other gram negative microorganisms 16 were belonged to pseudomonas spp. And salmonella were not found. The results were also agreed with that obtained by **Pattnall et al., (1997)** who investigated the microflora contaminating chicken carcasses at local slaughter house and the bacterial isolates were included proteus, pseudomonas, klebsiella and E. coli.

From public health of view, most of the isolated microorganisms in this study constitute public health hazard to the consumer as they have been increminating in cases of gastrointestinal food poisoning and bacterial dysentery, fever and vomition **Akhtar et al., (1982) , Rufus, (1988)** therefore , these results declared the importance of application of hazard analysis critical control point system (HACCP) which control the technological line of production at all points from the farm to table including production, transportation, slaughter, processing, storage, retail and food preparation to eliminate or even decrease the microbial loads in both chicken products and parts

Also **Ivan, (2000)** found that the cooling of carcasses in 4% citric acid or in 4% tartaric acid reduces the count of microorganisms 190 times compared to the control carcasses. So we recommend Such applications to introduce poultry products and parts of high sanitary and hygienic standard for consumption. It could be concluded that salmonella species could not be detected in the present study while other enterobacteriacaca were found at different ratios. Antemortem conditions aren't as important as the postmortem condition in delaying or preventing spoilage.

Results and discussion

Table (1) Incidence of isolation of salmonella and other Enterobacteriaceae from examined chicken produets (no = 50 of each)

Chicken product	Chicken kofta		Chicken luncheon		Chicken minced meat	
	No. +ve samples	%	No. +ve samples	%	No. +ve samples	%
Solmonella spp.	0	0	0	0	0	0
Other spp.						
Citrobacter fruendii	5	10	6	12%	7	14
E. coli	4	8	3	6%	4	8
Enterobacter spp.	3	6	2	4%	2	4
Klebsiella spp.	2	4	1	2%	3	6
Shigella flexneri	1	2	3	6%	3	6
Shigella sonnei	2	4	0	0%	1	2
Proteurs vulgaris	4	8	3	6%	5	10
Proteus merabilis	0	0	2	4%	3	6
Pseudomonas spp	0	6	0	0%	1	2
No. of isolates	20	40%	21	42%	31	62%

No. = tbe number of examined samples
% = percentage of positive samples

Table (2) : Incidence of isolation of salmonella and other Enterobacteriaceae from chicken parts.(No. = 50)

Chicken parts / Isolated Microorgonisms	Breast		Cloaca		Gizzard		Liver		Neck		Skin		Thigh		Wings	
	P	%	P	%	P	%	P	%	P	%	P	%	P	%	P	%
Salmonella ssp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other spp																
Citrobacter freundii	3	6	4	8	3	6	4	8	5	10	6	12	2	4	4	8
E. coli	0	0	3	6	1	2	3	6	2	4	2	4	1	2	2	4
Enterobacter spp.	2	4	3	6	1	2	0	0	1	2	2	4	3	6	1	2
Klebsiella spp.	0	0	1	2	0	0	0	0	0	0	1	2	1	2	0	0
Proteur vulgaris	3	6	5	10	4	8	3	6	3	6	4	8	3	6	4	8
Proteus mirabilis	2	4	1	2	2	4	4	8	2	4	3	6	1	2	1	2
Shigella flexneri	1	2	2	4	2	4	3	6	2	4	1	2	2	4	2	4
Shigella sonnei	0	0	0	0	0	0	0	0	1	2	2	4	1	2	0	2
Pseudomonas spp	0	0	1	2	0	0	1	2	0	0	1	2	0	0		0
No. of isolates	11	22	20	40	13	26	18	36	16	32	22	44	14	28	16	32

N.B
the total number for each chicken parts were 50 sample
P = the number of positive samples
% = the percentage of positive samples

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الملخص العربى

مدى تواجد ميكروبات السالمونيلا فى لحوم الدواجن وأجزائها المباعة بأسواق الشرقية

المشتركون فى البحث

إبراهيم محمد إسماعيل الشوربجى جيهان مصطفى بدر

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أجريت هذه الدراسة على مائة وخمسون عينة من مصنعات الدجاج (٥٠ عينة من كل كفتة الدجاج ، واللانشون واللحم المفروم) و ٤٠٠ عينة من أجزاء الدجاج المذبوح طازجاً (٥٠ عينة من كل الصدور ، فتحة المجمع ، الأجنحة ، العنق ، الأكباد ، القوانص ، الأفخاذ ، الجلد) تم جمعها من الأسواق المختلفة بالشرقية ونقلت للمعمل لفحصها بكتريولوجيا لكل السالمونيلا والميكروبات المعوية ولم نتمكن فى هذه الدراسة من عزل ميكروبات السالمونيلا بينما تم عزل الميكروبات المعوية فى منتجات الدجاج بنسب ٤٢، ٤٠، ٦٢٪ فى كل من الكفتة واللانشون واللحم المفروم وكانت نسبة المعزولات فى أجزاء الدجاج المختلفة ٢٢، ٤٠، ٢٦، ٣٦، ٣٢، ٤٤، ٢٨، ٣٢٪ على التوالى فى كل من)الصدور ، فتحة المجمع، القوانص ، الأكباد ، والرقبة ، والجلد ، الأفخاذ الأجنحة) على التوالى.

هذا وقد تم عزل وتصنيف عترات من البكتريا المعوية بنسب مختلفة من منتجات الدجاج وأجزائه المختلفة ومنها (الستيروباكتر فروندای ، الايكولای ، الأنتيروباكتر ، الكليبسيلا ، البووتيس فلجاريس ، البروتيس ميربيليس الشيجيلا فليكسنيرى ، الشيجيلا سونای وأنواع السيدونوناس) هذا وقد تمت مناقشة الأهمية الصحية للميكروبات المعزولة والإجراءات الواجب اتخاذها للحصول على منتج صحى سليم.