



Isolation of *Salmonella* from Chicken Cleaning Machines in Al-Najaff and Al-Hilla Provinces

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Abstract:

Chicken meat and its derivatives are among the foodstuffs considered by environmental health authorities to present the highest risks to the public.

A total of 50 samples were collected from different chicken cleaning machines, and tested for the present of *Salmonella*.

Environmental was carried out in Kauffman's tetrathionate broth and isolation on *Salmonella* – *Shigella* agar, Brilliant – green agar and (15) isolates were classified as *Salmonella* and this isolation pattern of contamination suggests a problem in transfer of *Salmonella* from chicken meat to the public.

Aim of the study:

- 1- The aim of this study to investigate the distribution of *Salmonella* through the chicken cleaning machines in Al-Najaff and Al-Hilla provinces during July 2011.
- 2- Study of antibiotics resistance of all isolates.

Introduction:

Chicken meats are among the most concern to public health, owning the associated risks of bacterial food-poisoning (1,2).

Bacterial transfer events are considered to be an important cause of transmission of food – borne diseases.

Traditionally, most studies on bacterial transfer have been presented in medical publication due to important role that in hospital (3).

Salmonella is one of the microorganisms most frequently associated with out breaks of illness spread by food. Chicken in general and other factors

(foods, hands, stainless steel surfaces, air fluids, cleaning machines, etc.) are the commonest source of food poisoning by *Salmonella* (4).

Although many other pathogens have received considerable attention, *Salmonella* remain among the leading sources of food – borne illness throughout much of the world (5).

In the 10 -15 years, a great increase in human food – borne infection caused by *Salmonella*, including *S. enterica* sub spp. *Enterica* *sevovar* *enteriditis* has been noted worldwide (6).

Chicken cleaning machines are considered one of the important pathway to transfer infection with *Salmonella* from site to another one (3).

Materials and methods:

Samples collection:

50 samples were collected from different area in Al- Najuff and Hilla provinces during July 2011.

Samples were collected in sterilized swabs, then samples inoculated on enrichment culture media (Kauffman's tetrathionate broth), and incubated aerobically at 37°C for 24 hrs.

Each specimen inoculated then on the S-S agar, Brilliant green agar and XLD agar plates. All plates were incubated at 37°C for 24-48 hrs. Then, biochemical test done to confirm the diagnosis (7).

Disk diffusion test was performed by using a pure culture of previously identified bacterial isolate. The most effective antibiotic for each bacterial isolate was determined as recommended by CLSI(2007).

Results and discussion:

In this study, 50 samples were collected from chicken cleaning machines, these samples were subjected for culturing on selective media to isolate *Salmonella*.

From 50 samples, only (5) (10 %) isolate from Al-Najaff and (10) (20 %)from Al-Hilla were found to be related to *Salmonella*.

These results agreement with the results by (3) who have showed that the *Salmonella* spp. Can be isolated from cleaning machines in rate reach to (40%).

(5) also reported that *Salmonella* spp. was isolate from chicken treated with clean machines in rate of (35%).

Contamination of chicken cleaning machines surfaces during chicken preparation due to *Salmonella* is one of the main causes of food borne out breaks (8).

Salmonella adhered to those surface of these machines are not easily removed by normal cleaning procedures. Therefore, they can be sources of contamination for other foods and objects (9).

(10; 11) who have pointed that *Salmonella* spp.is the one of the important type of bacteria that can affect human heath cross.

Also, this results obtained in this study are identical with those obtained by (12) who have succeed to isolate *Salmonella* spp. from different sources of kitchen equipments including chicken cleaning machines.

Results showed that contamination level varied from day to another, chicken preparation, chicken handling, cleaning machines by detergents, these points could lead to the introduction and spread of *Salmonella* contamination between chicken meat and cleaning machines, and if not subsequently removed could present an infection risk and facilities their spread (13).

Increasing antibiotic resistance in *Salmonella* spp . In a major therapeutic concern for physician in developing countries where typhoid and paratyphoid fever endemic.

The antibiotic profile of all isolates were investigation ,there were no differences of antibiotic susceptibility most of them showed multidrug resistance.

It has found that *Salmonella* spp . are resistance to Nalidixic acid (93.3%) and Ciprofloxacin (73.3%) and resistant (100%) to Ampicillin and Tetracycline, to Cefotaxime (33.3%) , Kanamycin (53.3%) , Trimethoprim(66.6%) and



Chloramphenicol(73.3%) these result where show in table(2) The isolates have shown resistance to B-Lactam group.

The resistance to Ampicillin and Cefotaxime(33.3%) are attributed to their production of B-Lactamase enzymes that breakdown the beta-lactam ring and render it inactive, this is mediated by extra-chromosomal piece of DNA (plasmid) or by decreasing membrane permeability to words the antimicrobial agents these results agreement with result mentioned by(14).

Chloramphenicol, Ampicillin and Trimethoprim have been widely used as the primary drugs for the treatment of enteric fever showed resistance (15) .

The resistance of Ciprofloxacin may be associated with point mutation in gyrA gene. Analysis of Quinolone resistance (Nalidixic acid ,Ciprofloxacin) determining region of gyrA in *Salmonella* isolates.

There are two novel patterns of Quinolone ,resistance depending on point mutation (16).Ciprofloxacin was bactericidal drug ,they affected against G-ve and G+ ve bacteria and the resistance to Fluoroquinolones was through chromosomal mutation or alternation affecting the ability to fluoroquinolone to penetrate to bacterial cell wall.(17) The multidrug resistance patterns in salmonella SPP.was transferred by a conjugative plasmid of about 50 kb .This plasmid harbored six genes responsible about resistance to Ampicillin, Chloramphenicol, Trimethoprim, Streptomycin,Tetracycline and Gentamycin.

Table (1) : colonial appearance and characteristics

Organism	Medium	Appearance
<i>Salmonella</i>	-MacConkey agar	*Non- lactose fermented
	-Xylose –Lysine – Deoxycholate agar	*Red with black center

Table (2):Antibiotic profile of *Salmonella* isolates

No .of isolates	Ampicillin	Ccefotaxime	Nalidixic acid	Ciprofloxacin	Trimethoprim	Tetracyclin	Chloramphicol
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	+	-	-	+	-	-
5	-	+	-	+	-	-	+
6	-	+	+	-	-	-	-
7	-	-	-	+	+	-	+
8	-	+	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	+	-	-	-	-	-
11	-	+	-	-	+	-	-
12	-	+	-	+	-	-	-
13	-	+	-	-	+	-	-
14	-	+	-	-	-	-	+
15	-	+	-	+	-	-	+
Resistance%	100%	33.3%	93.3%	73.3%	66.6%	100%	73.3%

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عزل السالمونيلا من الدجاج آلات تنظيف في مدينتي النجف و الحلة

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الخلاصة:

تعتبر لحوم الدجاج ومشتقاتها من بين اهم المنتجات التي لها صلة وثيقه بصحة الانسان وهي تعتبر مصدر خطورة فيما لو تلوثت مكائن التنظيف وخاصة بالبكتريا الممرضة.

تم جمع 50 عينة من مكائن تنظيف الدجاج في محافظتي النجف وبابل خلال شهر تموز لعام 2011، واختبرت العينات باحتوائها على بكتريا السالمونيلا.

بعد زراعه العينات على وسط الاغناء وتشخيصها بالأوساط الزرعية الخاصة تم الحصول على (15) عزلة نسبة (30 %)، (10 %) منها في محافظة النجف (20 %) منها في محافظة بابل .