

A Bacteriological study on *Salmonella* in ducks

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Abstract

From different places located at Giza governorate. A total of 200 samples of ducks and, 60 samples of their environment. The duck samples were collected from liver, spleen, intestine and faeces. Samples of environment were litter and water for detection of *Salmonella*. The incidence of *Salmonella* isolated from ducks and environmental samples were 13% and 10% respectively. Isolated *Salmonella* serovars in ducks and their environments were *Salmonella* Paratyphi (A), *Salmonella* Paratyphi (C), *Salmonella* Typhimurium, *Salmonella* Enteritidis, *Salmonella* Anatum and *Salmonella* Pona. The antibiotics which were more effective on isolated *Salmonella* serovars were ciprofloxacin and neomycin.

Key words:

Salmonella, ducks, antibiogram, serology.

Introduction

Salmonella is one of the most important micro-organisms that cause diseases in man and animals it is implicated in outbreaks of food borne infectious disease around the world (Abou-Zeed, *et al.*, 2000). *Salmonella* has a wide host range including human, animals and birds (Douce, *et al.*, 1991).

Salmonella remains a major cause of morbidity and even mortality through the globe. The extensive serotyping scheme and more modern methods of differentiating organism have permitted a far more detailed analysis of these organism than is possible with many others (Jayanetra *et al.*, 1990 ; Lam *et al.*, 2002 and Puglisi *et al.*, 2011).

Salmonella infections are probably the most frequently bacterial disease affecting ducks (Hoszowski and Wasil, 2005; Mituniewicz, *et al.*, 2007; Bin, *et al.*, 2008 and Mondai, *et al.*, 2008).

Salmonella is still considered a common cause of hazards, its economic importance related to the variable mortality they may provide (0 - 80% or over), loss in body weight increased feed conversion ratio and decreased productiv-

ity (El-Sawy, 1976 and El-Sawy, 1979). Heavy economic losses occur due to infection with salmonellosis and it leads to morbidity, mortality, reduced egg and meat production in ducks (Kumar and Kaushi, 1988)

In Egypt, many investigators isolated several serovars of *Salmonellae* and reported an incidence of (0.7 to 29.9%) in ducks. The apparently healthy ducks distribute the organism in the environment which is very harmful for human specially children (Abd El-Hamid, 1983 and Safwat, E.E.A. *et al.*, 1986).

Ducks play an important role in poultry industry and they are considered a great source for meat and eggs. They play a role in transmission of zoonotic bacteria to human beings to other animals. Heavy economic losses occur due to infection with salmonellosis and it leads to morbidity, mortality, reduced eggs and meat production in ducks (Kumar and Kaushi, 1988). In spite of dangerous effect of the ducks were live and remain to dissemination the organism in the environment between people, other birds, animals houses, canals and lands. The present study aimed to investigate the prevalence of *salmonella* in ducks and their

environment. As well as to typify the isolates and to determine its Antibigram pattern.

Material and methods

1- Collection of samples.

A total of 200 samples from different apparently healthy and diseased ducks (50 samples each of liver, spleen, intestine and faeces of ducks). Also 60 samples from the environment of the ducks (30 samples of litters and 30 samples from water for ducks). The samples were collected under aseptic condition and kept on an ice box and transferred to the laboratory as soon as possible.

2- Preparation of samples.

According to ISO, 6579 (2002), 25 gram of each sample provided with 225 ml of sterile buffer peptone water to provide 1/10 dilution for original dilution and incubate at $37^{\circ}\text{C} \pm 1$ for $18\text{hrs} \pm 2$. Then 0.1 ml of original dilution added to 9 ml of Rappaport Vassiliadis broth then incubated at 41.5°C for 24 hr, one ml of the pre-enrichment culture were also transferred to tube containing 10 ml of Tetrathionate broth and then incubated at 37°C for 24 hr. From the enrichment culture A loopful from selective broth as streaked on Xylose Lysine Deoxycholate plates, and Salmonella Shigella agar (S.S.) plates then incubated at 37°C for 24 hr. The plates having characteristic colonies of Salmonella were selected. A purified suspected Salmonella isolates were examined using Gram's stain according to

Cruichshank, *et al.*, (1975).

3- Biochemical identification.

Suspected isolated colonies were biochemically identified according to Carter (1986) and Quinn *et al.*, (1984).

4- Serological identification.

The purified identified Salmonella were typed serologically according to Kauffmann White Scheme (Kauffmann 1973) by slide agglutination test using polyvalent O Salmonellae antiserum Colonies which showed positive results were similarity tested using monovalent corresponding O and H Salmonellae antisera (DENKA. SEIKEN) Tokyo. Japan.

5- Antibigram.

It was done according to Finegold and Martin (1982) using Muller Hinton agar (Oxoid) and commercial antibiotics discs (Oxoid) including for determination of susceptibility of the isolated Salmonella. Antibiotics were adopted using the disc diffusion technique, the discs that used for Salmonella were Ampicillin, Amoxicillin, Gentamicin, Neomycin, Erythromycin, Oxytetracycline, Ciprofloxacin, Streptomycin, Erythromycin, Chloramphenicol, Nalidixic acid and Furazolidine.

Results

Out of 200 samples of ducks, 26 samples were positive for Salmonella with a percentage of 13% (Table 1).

Table (1). The prevalence of Salmonella in ducks samples.

No.	Sample types	No. of Samples	No. of <i>Salmonella</i> isolates	Percentage
1	Liver samples	50	7	14%
2	Spleen samples	50	5	10%
3	Intestine samples	50	8	16%
4	Faeces samples	50	6	12%
	Total	200	26	13 %

The prevalence of Salmonella isolates in duck environment, showed that 4 isolates were positive for Salmonella in litter samples (13.3 %) and 2 isolates were recovered from water samples (6.6 %).

Table (2). The prevalence of *Salmonella* in duck environment

No.	Duck environment types	No. of samples	No. of <i>Salmonella</i> isolates	Percentage
1	Litter Samples	30	4	13.3%
2	Water Samples	30	2	6.6%
	Total	60	6	10

A total of 32 *Salmonella* isolates represented by 6 serovars; *S. Paratyphi* (A), *S. Paratyphi* (C), *S. Typhimurum*, *S. Enteritidis*, *S. Anatum* and *S. Pona*.

Table (3). Incidence of *Salmonella* serotype in examined samples.

No.	<i>Salmonella</i> Serovars	Liver samples		Spleen samples		Intestine samples		Faeces Samples		Litter Samples		Water Samples	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	<i>S. Paratyphi</i> (A)	1	3.1%	1	3.1%	1	3.1%	2	6.2 %	1	3.1 %	-	-
2	<i>S. Paratyphi</i> (C)	1	3.1%	-	-	-	-	1	3.1 %	1	3.1%	-	-
3	<i>S. Typhimurim</i>	3	9.3%	2	6.2 %	3	9.3%	1	3.1 %	1	3.1 %	1	3.1 %
4	<i>S. Enteritidis</i>	1	3.1%	2	6.2 %	2	6.2%	1	3.1%	1	3.1%	1	3.1 %
5	<i>S. Anatum</i>	1	3.1 %	-	-	1	3.1%	1	3.1%	-	-	-	-
6	<i>S. Pona</i>	1	3.1%	-	-	-	-	1	3.1%	-	-	-	-

Table (4). Showed that the *Salmonella* Serovars were sensitive – moderate sensitive or resistant for therapeutic agent we are found that Ciprofloxacin is more effective of *Salmonella* serovars.

No.	S.Srotypes Therapiotec Agents	S.Paratyph (A)			S. Paratyphi (C)			S.Typhimurim			S. Enteritidis			S.Anatum			S.Pona		
		S	M	R	S	M	R	S	M	R	S	M	R	S	M	R	S	M	R
1	Ampicillin	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R
2	Amoxicillin	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R
3	Erythronycin	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R
4	Gentamycin	-	M	-	-	M	-	S	-	-	S	-	-	S	-	-	S	-	-
5	Chobromphicol	S	-	-	S	-	-	S	-	-	-	M	-	-	M	-	S	-	-
6	Streptomycin	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R
7	Nalidixic acid	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-
8	Cipro Floxacin	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-
9	Tetracycline	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R
10	Neomycin	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-	S	-	-
11	Furazolidone	-	M	-	-	M	-	S	-	-	-	M	-	-	M	-	-	M	-
12	Flumoquine	-	M	-	-	M	-	-	M	-	-	M	-	-	M	-	-	M	-

S = Sensitive. M = Moderate S. R = Resistance .

Discussion

Salmonella incidence has been increased as a major public health hazard (Rose *et al.*, 1991) and the contaminated ducks and their droppings with Salmonella are considered as source for human salmonellosis in outbreaks in many countries (Gost, 1993, Humphery 1999 and Gost, 2001).

Results tabulated in Table (1) and Table (2) indicated isolation of 8 *Salmonella* from Ducks samples and their environment this Results agree with the reported by (Bin *et al.*, 2008, Osman *et al.*, 2010, Hoszowoki and Wasil 2005 and lam *et al.*, 2002)

The isolated Salmonella serotypes from ducks and their environments samples in present data are similar isolates of Salmonella serotypes where reported by (Shehata, 1980, El-Taher, 1977, Orjiet *et al.*, 2005 and Mitchell and Ridgewell, 1971).

The percentage of Salmonella serovars isolates in this presented data are in agree with (Bisgard, 1981 and Tsai and Hsion, 2005). These results are nearly in similar to with that obtained Lam *et al.*, (2008) who reported that the prevalence of Salmonella infection was (10%) in one day old duckling. Moreover Mondai *et al.*, (2008) performed a study on 65 cloacal samples were collected from ducks of different regions. Out of 65 samples 9 were found positive (13.07%). This results higher than that reported by Ibrahim, *et al.*, (2013) who stated that total occurrence of Salmonella spp. In 50 cloacal samples of ducks was 6% and Rampersad, *et al.*, (2008) stated that five samples out of 110 fecal samples from Muscovy ducks were found positive for Salmonella by bacterial culture. Further more these findings are lower than those detected by Muller, (1965) who detected Salmonella in 16% of duck feces. And Shamoon (1998) who isolated Salmonella from digestive tract of ducks breed in open house and it was 10 out of 60 birds (16.6%).

In Egypt, many investigators isolated serovars species of *Salmonellae* and reported an incidence ranged from (0.7% to 29.9% in ducks) (Abd El-hamid, 1983; Safwat *et al.*, 1986).

This results are in agreement agree with the results in these studies.

The point of interest in our study is the isolates of salmonella partyphi (A) which cause food poisoning in human consume.

Since one of the main purpose of such investigation it to find out the most suitable method for control the AntibioGram was carried out against Salmonella isolates, the results showed that Salmonella was sensitive to Neomycin, CirpoFloxacin, Nalidixic acid, but moderate sensitive to Gentamycin, chloraphincol and Furazolidone, moreover mean while resistance of Salmonella to Ampicillin, Amoxicillin and Erthromycin were recorded. These findings are supported by (Tour Frade, 1984 and Coghnan, 1996).

Regardless of the different sensitivity patterns of Salmonella, the AntibioGram is still the valid method for the drug of choice to control Salmonella infection. (Abd El-Hamid *et al.*, 1983, Helfrman, 1991, Hegazi. 2002, Rahman *et al.*, 1999 and Alali *et al.*, 2010).

Ducks play an important role in poultry industry and are considered a great source for meat and eggs, also it plays role in transmission of Salmonella to human being (Zoonotic disease). Heavy Economic losses occurs due to infection with Salmonellosis which lead to morbidity and mortality, also reduced in egg and meat production industry (Kumer and Kaushi, 1988). Also its responsible for severe economic losses to the poultry industry in many The present study revealed that the common isolated serotypes were S.Paratyphi (A) S.Paratyphi (C), S.Typhimurium, S.Enteritides, S.Anatum and S.Pona. The obtained results differ with Sinko *et al.*, (1988) who isolate S.Typhimurium, S.Anatum S.Meleagridis, S.Enteritidis, S.Infantis, and S.Virchow (61%, 22%, 4%, 1%, 1%, 1%) respectively. While Milakovic-Novak and Selec, (1990) isolated S.Typhimurium and S.Agona from ducks and they were the most predominant serovars. Also Ibrahim, *et al.*, (2013) detect S.Typhimurium and S.SaintPaul in ducks.

In different Parts of the world (Desai *et al.*, 2005) the isolated Salmonella serovars were

causing severe diseases in ducks itself which caused death. *Salmonella* Anatum with reported by **Williams (1978)**, also *Salmonella* Typhimurium causing arthritis in Ducks was reported by **Bisgard (1981)**. Moreover, the isolated *Salmonella* Paratyphi (A) in this presented data which is pathogenic for human and animal. This was also reported by (**Orgi et al., 2005**).

References

- Abd. El-Hamid, H.S. (1983)**. Further studies on salmonellosis in poultry. Ph.D.. Thesis. Faculty of Vet. Med. Alex. Univ.
- Abou-Zeed, Y.M.; Hariharan, H.; Poppe, C. and Kibengo F.S.B. (2000)**. Characterization of *Salmonella* isolates from broiler chickens and humans sources on prince Edward island. *Comparative Immunology Microbiology and Infectious Diseases*, 23;253-266.
- Agtragulnonth, A. and Pan-Urai, R. (1990)**. *Salmonella* Krefeld in Thailand J. Epidemiology, infection and drug resistance. *Southeast Asian Journal of tropical median and Public Health*, 21 : 3, 354-360
- Alali, W.Q.; Thakar, S.; Berghaus, R.D.; Martin, M.P. and Gebreyes, W.A. (2010)**. Prevalence and distribution of *Salmonella* in organic and conventional broiler poultry farms foodborne pathog. *Dis. 7*(11);1363-1371. epub.2010 jul 9.
- Bijoux, J.; Boding, G.i.; Tripoli, A.; Caries, M. am, N. D.i Anh, N.P. and Burger, I. (2002)**. Preliminary survey of the *Salmonella* infection in ducks in can the proven ce, Vietnam. *Khan hoc ky that the Y (Veterinary Science and technique)*. 9. 1,6.
- Bin, Y.; Chan, A.C.I SHu, M.w.1 xuan. S.D.I Hua, Z.Z.; Ehun, N.Y., Ding, C. and Yen, S.C. (2008)**. Application of an in direct immuno fluorescent staining method for detection of *Salmonella* Enteritidis in paraffin slices and antigen location in infected duck tissue *World journal of gastro entomology*. 14:5,776-781:32ref.
- Bisgaard, M. (1981)**. Arthritis in ducks . J, Aetiologiical and Public health aspect. *Avian Dis. 10* (1) ;11-21.
- Carter, G.R. (1986)**. *Essentials of Veterinary Bacteriology and Virology*. 3^{ed}. Lea, febiger, Philadelphia, U.S.A
- Cruickshank, R; Duguid, J.P.; Marmion, B.P. and Swaim, R.H.A. (1975)**. *Medical Microbiology, the practical of medical Microbiology*. 12ed., Churchill livngstone, Edinburgh.
- Coghian, A. (1996)**. *Animals Antibiotics treated hospital epidemics* .New scientist, 151;7.
- Desai, A.R.; Shan, D.H.; Sharing, S.; Lee, M.J; Y.H; Chv, M.R. Park, i.H.; ED S.K.; lee. I.H. and Choe, J.S. (2005)**. An allelspelic PCR assay for the rapid and sno type Spelas detection of *Salmonella pullrum* *Avian Discuses* 49 (4) 558-561.
- Douse, G, Amine I. and Strphen, i. (1991)**. Invasion of HEP2 cells by strain of *Salmonella Typhimurium* of different virulence in relation to gastro-entritiis. *J. Med. Microiol.* (35)257-349.
- EL-Sawy. E. (1976)**. Student on Salmonellosis in dukes M. V. Sc. Thesis. Vet. Med., Cairo Univ. Egypt.
- El. Sawy. E. (1979)**. Student on Salmonellosis in ducks in Egypt wilt special reference to the role of different phage type in controlling the disease- Ph. D. Thesis Fac. Vet. Med. Cairo. Univ.
- El-Taher, A. (1977)**. Studies on paratyphoid infection in ducks in Zagazig province Ph., D. Thesis. Fac. Vet. Med., Zagazig Univ. Egypt.
- Finegold, S.M. and Marten E.T. (1982)**. *Diagnostic Microbiology*. 6 Ed. The C.V. Mosby Company, St. Lous, Toronto, London.
- Gast, R.K. (1993)**. Dection of *Salmonella* Entritidis in experimentally infected laying hens by culturing pools of egg contents *Poult. Sci.*, 72;267-274.
- Gast, R.K. (2001)**. The past present and the future of *Salmonella* control in poultry .XII Iernational Congress of the World Veterinary Poultry Association, Cairo, Egypt. 17-21 September.

- Heffernan, H.M. (1991).** Antibiotic resistance among *Salmonella* from human and other sources in New Zealand. *Epidemiol. Infect.*, 106 (1)17-23.
- Hegazy, A.E.H.M. (2002).** Epidemiological studies on salmonellosis in chicken with special reference to *Salmonella* Enteritidis., Ph. D. Thesis Fac. Vet. Med. Alex. Univ. Egypt. 61: 660-663.
- Hoszowski, A. and Wasil, D. (2005).** *Salmonella* prevalence and resisting to antibiotics in Poland. *Med. weterynaryjna*. 61: 660-663. 10 rel.
- Humphery, T.I. (1999).** Important and relevant attributes of the *Salmonella* organism, *Vet. Sci. Zootenic int.*, May 48-51. *Indian Journal of Poultry Science* 23: 104-106.
- ISO 6579 (2002).** Microbiology of food and animal feeding stuffs horizontal methods for the detection of *Salmonella* species 4Ed. International Organization for Standardization. Jay nectar, P, Voracity, M. I Pilantanapak, A., Panbangred, W. I b
- Jayanetra, P., Vorachit, M., Pilantanapak, A, Panbangred, W., Bangtragulmonth, A and Pan-urai, R. (1990).** *Salmonella* krefeld in Thailand. *J. Epidemiology, infection and drug resistance. southwest Asian J. of Tropical Medicine and public Health.* 21;3,354-360.
- Kauffmann, F. (1973).** Serological diagnosis of *Salmonella* species Kauffmann White Scheme, Copenhagen. Denmark.
- Kulanich B, Gehring R, Webb A,I, Craig-mill AI and Riviere, JE. (2005).** Effect of formulation and route of administration on tissue residues and withdrawal times. *Journal. A. M. Vet. Med. Assoc.*, 227; 1547-1577.
- Kumer, A. and Kaushi, R.k. (1988).** Investigation of fowl typhoid in Haryana state
- Kauffmann, F. (1973).** Serological diagnosis of *Salmonella* species Kauffmann White Scheme Copenhagen. Denmark.
- Lam, N.D., Anh, N.P., Brugere-Picux, J., Bodin, G., Ttipodi, A. and Carter M. (2002).** preliminary survey of *Salmonella* infection in ducks in Can tTho Vitnam . Khoa Hoe Ky Thuat Thu Y. (Veterinary Sciences and Techniques). 9;1, 6-12.
- Ibrahim, M.A.; Emeah, H.H.; Nahed H. Ghoneim, and Abdel Halim, M.A. (2013).** Sero epidemiological Studies on Poultry Salmonellosis and its Public Health Importance *J. Worlds Poult. Res.* 3(1);18-23, 2013
- Milakovic-Novak, L. and Selec, A. (1990).** *Salmonella* in poultry egg , meat products and some feeds. *Veterinarski arhiv.* 60;1,1-8.19 ref.
- Mituniewicz. T.I Semen Ski, i.I Iwaneczuk Czemik, K.i Witkowska. D.i Wojcik, a.I kleinsmidt, K. and Sobezak, I. (2007).** *Salmonella* bacteria occurrence on poultry farms in warmia and Imazury province between 2001-2005. *Medycyna Wetnaryjna.* 63 :9, 1081-1083.4ref
- Mitchell, R.T. and Ridgwell, T. (1971).** The frequency of *Salmonella* in ducks *J. Med. Microbiol.* (4) 359-361.
- Mondai, T., khan M.S.R; Alam, M as;, M.P. [Purerleyastha. M. and Siddigue.: (2008).** Isolation, identification and characterization of *Salmonella* from duck. *Band lab Journal Veterinary Medicine* 6: 1, 7-12 8 ref.
- Muller, G. (1965).** *Salmonella* in bird feces. *Nature*, 207 ;1315.
- Orji, M.U., Onuigbo, H.C. and Mbata, T.I. (2005).** Isolation of *Salmonella* from poultry droppings and other environmental sources in Awka Nigeria *Int. J .Infect. Dis.* 9 (2);86-89.;
- Osman, K.M., Yousf, A.M., Aly, M.M. and Radwan, M.I. (2010).** *Salmonella* spp. Infection in 10 day-old chicks, ducklings, and turkey poults a public. *Foodborne Pathog. Dis.* 7(4) 383-390 Health risk.
- Puglisi, N.1.; Cerebella, E.1.; Pizza, C.1.; Pupil, A. and Camaro, A. (2011).** Validation of semi nested PCR approach for *Salmonella* enteric sub sp. Enterica serovar gallinarum . *J. microbial-Methods.*
- Puglisi, N.1.; Cerebella, E.1.; Pizza, C.1.; Pupil, A. and Camaro, A. (2011).** Validation of semi nested PCR approach for *Salmonella* enteric sub sp. Enterica serovar gallinarum. *J. microbial-Methods* (1) 22-27.

- Epub 2011 Jan 21.
- Quinn, P.J., Carter, M.E. Markey, B.K. and Carter, G.R. (1994).** Clinical Veterinary Microbiology. Mosby, Yearbook Europe Limited.
- Rahman, H., Mukit, A., Goswami, S. and Kabit Roy. (1999).** Outbreak of Salmonellosis in ducklings in Assam. Indian J. Comparative Microbiology, Immunology and Infectious Diseases 20;1, 26-28. 9 ref.
- Rampersad, J.; Johnson, J.; Brown, G. Samlal, M. and Ammons, D. (2008).** Comparison of polymerase chain reaction and bacterial culture for Salmonella detection in the Muscovy duck in Trinidad and Tobago. Revista Panamericana de Salud Publica, Pan American J. of Public Health.23;4,264-267.15ref.
- Rose, B.E.; Liabers, C.M. and Bennett B. (1991).** Evaluation of a colorimetric DNA hybridization test for detection of Salmonella in meat and poultry products. J. Food Prot., 54; 127-130.
- Safwat, E.E.A; Wahba, S.I.; Metwally. N. and Reyaie, M. (1986).** incidence of Salmonella and other gram negative organisms in Balady ducks and in fertile eggs.
- Shahata, M.M. (1980).** Some studies on paratyphoid infection in poultry in upper Egypt. Ph. D. Thesis. Fat. Vet. Med., Assuit Univ.
- Shamoon, G.N.; Ali, T.S. and Al-Atar, M.Y. (1998).** Isolation of Salmonella from local ducks. Iraqi J. of Vet. Sci.11-2,75-68.
- Simko, S. (1988).** Salmonellae in ducks and geese on farms with latent infections and in centers of Salmonellosis. Immunoprophylaxis.1-2,92-101.15ref..
- Tauxe, R. (1991).** Salmonella a part modern pathogen J. Food Prot., 54 (7): 563-568.
- Tourfrod, A. (1984).** Linking drugs to the dinner table antibiotics on the farm may be played a role in human disease time, 124,84.
- Tsai, H.J. and Hsiang, P.H. (2005).** The prevalence and antimicrobial susceptibilities of Salmonella in ducks in Taiwan. J. Vet. Med. Sci.67(1) 7-12.
- Williams, J.E. (1978).** Paratyphoid infection of poultry Iowa State Univ. Press. Ames.

دراسة عن السالمونيلا في البط

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وحدة السيرولوجى – معهد بحوث صحة الحيوان بالدقى

الملخص العربى

تم عزل ميكروب السالمونيلا من البط والبيئة المحيطة به فى أماكن مختلفة من محافظة الجيزة . حيث تم فحص عدد (٢٠٠) عينة من البط ممثلة فى اجزاء من (الكبد – الطحال – الامعاء – الاخراج والفضلات) بينما كانت عينات البيئة المحيطة بالبط التى تم فحصها عدد (٦٠) عينة ممثلة فى (الفرشة - مياه الشرب) كانت نسبة عزل السالمونيلا فى عينات البط هى (١٣ %) بينما كانت نسبة العزل للسالمونيلا (١٠ %) فى البيئة المحيطة به . تم عزل الميكروب باستخدام الطرق التشخيصية المختلفة من العزل البكتيريولوجى والفحص البيوكيميائى والاختبارات السيرولوجية لتعريف الميكروب المعزول مع دراسة حساسية هذه المعزولات للمضادات الحيوية المختلفة وكانت العتلات المعزولة من عينات البط والبيئة المحيطة به هى: سالمونيلا باراتيفى (A) - سالمونيلا باراتيفى (C) - سالمونيلا تيفيوميوريم - سالمونيلا انترتيدس - سالمونيلا اناتم - سالمونيلا بونا .

وجد من دراسة حساسية الميكروبات المعزولة للسالمونيلا انها اكثر حساسية للسيروفلوكلوكساسين والنيومايسين.