ROLE OF BIOSECURITY MEASURES IN CONTROL OF SOME ZOONOTIC PATHOGENS IN POULTRY FARMS

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ABSTRACT

The biosecurity status in poultry farms can be deteeted according to the prevalence of some pathogens of biosecurity coneern such as Salmonella which serve as a model for evaluation of biosecurity status in the poultry farms. We investigated the biosecurity status in the different poultry operations (hatchery, breeder, layer and broiler). Samples were eolleeted from the hatchery, birds and the surrounding environment to evaluate some epidemiological patterns of some pathogens of biosecurity importance such as Salmonella. We found that the highest isolation rate of Salmonella was detedcted from broiler farm 16.2% and followed by layer and breeder farms as 11.5%, respectively. Most common isolated serotypes were S.kentucky, S.newport, S.kottobas, S.tallahatse, S.typhi and S.derbi as 50, 40, 22.2, 25, 20 and 6.25%, respectively. The highest isolation rate from the examined farms was at 2, 37 and 50 weeks, respeetively from broiler, layer and breeder farm. This reflect the very important role of bioseeurity application in the poultry farms to keep such microorganism of great economic and publie health importanee away.

INTRODUCTION

The poultry and egg sector in Egypt has developed dramatically since the early 1990s, fueled by economic reform and government policy shifts (**Abaza et al., 2008**). In 2001, poultry meat production, reached 646,600 tons, exceeded all other meats including beef, mutton, camel and others (**Altman, 2002**). In value terms, 26 percent of Egypt's total livestock products came from poultry meat and egg production (**Namatalla, 2006**).

Egypt's poultry sector ineludes chickens, which are subdivided into commercial (international breeds) and Balady (traditional breeds) operations. In 2002, 63 percent of Egypt's chicken meat output was produced by commercial operations, the traditional (backyard) operations, in contrast, produce 22 percent of chicken meat, 64 pereent of ducks, 34 percent of turkeys, and all geese and pigeons (**Kandy Ringer, 2008**).

Disease outbreaks cost poultry producers and related industries millions of dollars a year in lost revenue (**Zanderet al., 1997**). The principles of disease prevention and control within the poultry industry are based on flock management, bioseeurity, preventive vaccination and sanitation (**Wegener et al., 2003**).

In the present time, the various trends of poultry industries are present to potentially increase the spread of diseases. Most of these diseases are of economic and food safety concern **(Vandeplas et al., 2010)**. Salmonella is among the most important food borne pathogens that cause million cases of infections and hundreds of deaths each year in the United States **(Kang et al., 2006)**.

Salmonella have been identified as common pathogens found in broilers, layers, and breeder parent stock and in eggs from layers **(Sasipreeyajan et al., 1996 and Deng et al., 2008)** and can be serve as a model for evaluation of biosecurity status in poultry operations **(Jerngklinchan et al., 1994 and Van Hoorebeke et al., 2010)**. The main risk factors for Salmonella infection are flock size, housing system and farm with hens of different ages **(Mason, 2006)**.

At the moment, there are only a few studies available on biosecurity and management practices related to control of infections in commercial poultry farms **(Boklund et al., 2003 and Boklund et al., 2004)**.

Therefore the present study was carried out to determine some epidemiological pattern of some pathogens of bioseeurity eoncern Salmonella species in different poultry production units and also to evaluate the assoeiation between poultry farm characteristics and the isolation of pathogens of biosecurity concern in the poultry operations.

MATERIAL AND METHODS

A field study was carried out on a hatchery and three commercial poultry farms with different types of production (breeder, layers and broiler) during the rearing and the produetion period loeated in Dakhlia governorate, Egypt during the period from January 2008 till the end of April 2010 to follow up the occurrence and risk factors of some pathogens of biosecurity concern, Salmonella spp. in different stages of poultry production.

Methods:

I- Measurment of environmental parameters: ambient temperature and relative humidity were measured at each visit to the farms in different seasons, the average temperature during winter season in the breeder, layer and broiler houses was 20.7, 22 3 and 25.5°c, respectively; meanwhile in summer was 31.7, 33.4 and 32°e, respectively. The ambient temperature in autumn was ranged between 24-27.6°c in the three farms. The relative humidity recorded the highest level in winter as 64.4, 63.4 and 70.3% in the breeder, layer and broiler farms, respectively, and the lowest measure was recorded in the spring as 55.02, 54.95 and 50.1% in the three examined farms, respeetively.

II- Sample eollection: samples were collected weekly from the broiler house, twice per week from breeder and layer farms and monthly from the hatchery. Samples were collected from hatchery, birds and surrounding environment in the different poultry operations as methods adopted by **(Cruickshank et al., 1975; Ahmed, 1984; Jones et al., 1991 and Sadoma, 1997)**.

A) Hatchery sampling: samples were collected from dead in shell, fluff, meconium, egg shell fragments, hatchery interior, chick sorting area, chick box and ventilation outlets as

methods described by **(Roy et al., 2002)**.

B) Poultry farms

i. Birds sampling; cloacal swabs were collected from the birds during each visit at the morning using sterile cotton gauze pads moistened in sterile BPW(buffered peptone water) were inserted into the cloacae of healthy and diseased birds and then withdrawn to form composite samples. The swabs were immersed into bottle containing BPW under aseptic conditions and transferred to the laboratory **(Sadoma, 1997)**.

ii. Environmental sampling; Samples include (litter, feed, water, air, swabs from workers' hands and foot boots and swabs from house structure as wall, floor, fans, drinkers and feeders) were taken from the surrounding environment inside the poultry house during the rearing and production periods as methods described by (Sadoma, 1997).

II- Isolation of some pathogens of biosecurity concern (Salmonella spp.) in poultry operations

This work was done in the department of Hygiene and Zoonoses, Faculty of veterinary medicine, Mansoura University.

Isolation of Salmonella species: The collected swabs and samples from the hatchery, birds and their surrounding environment were pre-enriched in BPW (buffered peptone water) at 37°c for 24 hrs, and then 0.1 ml of pre-enriched cultured broth was inoculated into 10 ml of Rappaport-Vassiliadis (RV) broth and incubated at 41.5°c for 24 hrs. After enrichment, a loopful from the enriched cultured broth was streaked onto Xylose lysine deoxycholate agar (XLD) and incubated at 37°c for 18-24hrs. After incubation, 3-5 suspect colonies were picked up, purified by streaking onto nutrient gar plates and incubated at 37°c for 18-24hrs. The purified colonies were streaked onto nutrient agar slants and incubated at 37°c for 18-24hrs for further identification (Cruickshank et al., 1975).

III- Identification of Salmonella isolates; The pure colonies of Salmonella isolated from the birds and their surrounding environment were subjected to microscopical, biochemical and serological identification as methods described by (Cruickshank et al., 1975).

RESULTS & DISCUSSION

Egg, environment and feed contamination are the main sources of Salmonella infection in poultry. Results in table 1 shows the frequency and distribution of Salmonella spp. in the breeder farm, where Salmonellae were isolated from cloacal swabs, litter, feed, water, air, hand and foot boot swabs from workers, wall swabs, fann' swabs, cage swabs and egg shell swabs as following 28, 24, 22, 18, 6, 0, 4, 8, 0, 10 and 6%, respectively. The highest average isolation rate of Salmonella was detected at 50 weeks of age as 25.5% and the lowest was recorded at 2 weeks of age as 7.8%. Higher levels of isolated Salmonella spp. were found by (Cox et al., 1983) from feed samples; however fewer percentages were reported by (Echeverria et al., 1987). The intermittently positive sampling might be explained by a lack of sensitivity of the sampling and test method, combined with a very low infection pressure (Skov et al., 1999). Nearly similar results for Salmonella isolation from

drinker water samples were recorded as (12.5%) by **(Jafari et al., 2006)**. Similar results for isolation of Salmonella from cage swabs were found by **(Limawongpranee et al., 1999)**.

Table 2 clarifies the isolation rate of Salmonella from the layer farm at different ages as 38, 32, 20, 14, 2, 0, 2, 4, 4, 4 and 6% from cloacal swabs, litter, feed, water, air, hand and footboot swabs, fans' swabs, cage swabs and egg shell swabs, respectively. The highest average Salmonella observed in the layer farm was detected at 37 week of age and such data run with that published by **(Wiard et al., 2001 and Sulem et al., 2003)**. Similar results for Salmonella isolation were recorded by **(Cox et al., 1983 and Jafari et al., 2006)**; however fewer percentages were also indicated by **(Mohammad, 1999)**.

Results in table 3 revealed that Salmonellae were isolated from the broiler farm from the previously mentioned samples except cage and egg shell swabs not collected were as following 46, 38, 20, 22, 2, 6, 4, 4 and 4, respectively. **Morgan- Jones, (1980)** found that more water samples were positive to Salmonellae in a broiler facility, when water was provided in troughs. Salmonellae were also isolated from 21.6% of the broiler farms, and from 12.3% of the water samples examined in Canada by **(Poppe et al., 1991) and (Hoover et al., 1997; Kirk et al., 2002 and Jafari et al., 2006)** found similar results.

As shown in (table 4); the highest level of Salmonella isolation from cloacal swabs was from brioler farm 46%, followed by layer farm 38% and finally the breeder farm 28% and this can be attributed to the higher measures of biosecurity undertaken in the breeder farm than the other two farms. For litter samples the highest rate of isolation was also from broiler farm followed by the layer and breeder farms as 38, 32 and 24%, respectively. The same results for feed as 22% from broiler farm and 20% for both layer and breeder farms. For water samples Salmonellae were isolated as 18, 14 and 22% from breeder, layer and broiler farms, respectively. From air, it was isolated as 6, 2 and 2 from the three farms, repsctively. The same results were recorded for other samples except higher level of Salmonellae isolation was detected from wall swabs in the breeder farm as 8% followed by 4% from both layer and broiler farms of each.

The results shown in (table 5) revealed that Salmonellae were isolated as (6.7, 10, 13.3, 13.3, 16.7, 6.7, 6.7, 6.7 and 13.3%) from hatchery interior, ventilation outlets, chick box, chick sorting area, dead inshell, egg contents and fluff, respectively in the three hatchers under examination. Nearly similar results were recorded by **(Barbour and Nabbut, 1981; Bastaworws et al., 1997 and Roy et al., 2002)**. The presence of Salmonellae in egg contents of hatching eggs could be due to either the penetration of Salmonellae through the shell into the egg contents or to transovarian transmission **(Barbour and Nabbut, 1982)**.

Table 6 found from serotyping of 67 Salmonella isolates, 10 serovars were identified, the most common serovar isolated Salmonella kentucky 50%. The second serovar is Salmonella newport as 25 and 40% from egg content and fluff samples, respectively which

isolated from the hatchery, the next serovar is Salmonella kottobas detected at 50% from breeder and layer feed samples. Salmonella typhi serovar was identified at a frequency of 20% from broiler feed samples, Salmonella tallahatse isolated as 25% from drinker water samples in the layer farm and the last identified serovar was Salmonella debri (6.25%) which have been isolated from litter specimens in the broiler farm. Similar results revealed that the most common isolated serovar from poultry and poultry environment was S.kentucky **(USA-FSIS, 1999; Jones et al., 1991 and Roy et al., 2002)**.

(1) : Frequency and distibution of Salmonella spp. detected from different samples in the breeder farm

Age / Sample type	Breeder farm — No. of +ve samples/ no. of total samples tested for birds of indicated age (week)											
	0-2		3-7		8-20		21-35		36 onwards			
	No.	%	No.	%	No.	%	No.	%	No.	%	Total	%
1- Cloacal swabs	1/10	10	2/10	20	3/10	30	3/10	30	5/10	50	14/50	28
2- Litter	3/10	30	2/10	20	1/10	30	2/10	20	4/10	40	12/50	24
3- Feed	1/10	10	2/10	20	2/10	20	2/10	20	4/10	40	11/50	22
4- Water	2/10	20	0	0	1/10	10	3/10	30	3/10	30	9/50	18
5- Air	0	0	1/10	10	0	0	0	0	2/10	20	3/50	6
6- Hand swabs	0	0	0	0	0	0	0	0	0	0	0	0
7- Footboot swab	0	0	1/10	10	0	0	0	0	1/10	0	2/50	4
8- Wall swabs	0	0	0	0	0	0	1/10	10	3/10	0	4/50	8
9- Fans'swabs	0	0	0	0	0	0	0	0	0	0	0	0
10- Cage swabs	NA	_	NA	_	1/10	10	0	0	4/10	40	5/50	10
11- Egg shell swabs	NA	_	NA	_	1/10	10	0	0	2/10	20	3/50	6
Total	7/90	7.8	8/90	8.9	9/110	8.2	11/110	10	28/110	25.5	63/550	11.5

Table (2) : Frequency and distibution of Salmonella spp. detected from different samples in the layer fa

Age / Sample type	Layer farm: No.of +ve samples/ no.of total samples tested for birds of indicated age (week)											
	0-2		3-7		8-20		21-35		36 onwards			
	No.	%	No.	%	No.	%	No.	%	No.	%	Total	%
1- Cloacal swabs	3/10	30	1/10	20	4/10	40	3/10	30	8/10	50	19/50	38
2- Litter	2/10	20	1/10	20	2/10	20	3/10	20	8/10	40	16/50	32
3- Feed	2/10	20	1/10	20	0	0	2/10	20	4/10	40	10/50	20
4- Water	2/10	20	0	0	1/10	10	1/10	30	3/10	30	7/50	14
5- Air	0	0	0	10	0	0	0	0	1/10	20	1/50	2
6- Hand swabs	0	0	0	0	0	0	0	0	0	0	0	0
7- Footboot swab	0	0	0	10	0	0	0	0	1/10	0	1/50	2
8- Wall swabs	0	0	0	0	1/10	10	0	10	1/10	0	2/50	4
9- Fans'swabs	0	0	1/10	10	0	0	0	0	1/10	0	2/50	4
10- Cage swabs	NA	_	NA	_	0	0	0	0	2/10	40	2/50	4
11- Eggshell swabs	NA	_	NA	_	0	0	0	1/10	2/10	20	3/50	6
Total	9/90	10	4/90	4.4	8/110	7.3	10/110	9.1	31/110	27.3	61/550	11.1

le (3) : Frequency and distibution of Salmonella spp. detected from different samples in the broiler fa

Age / Sample type	Broiler farm: No.of+ve samples/ no.of total samples tested for birds of indicated age (week)											
	0-1		2-3		4-5		6-7		8-9			
	No.	%	No.	%	No.	%	No.	%	No.	%	Total	%
1- Cloacal swabs	6/10	60	8/10	80	5/10	50	2/10	20	2/10	20	23/50	46
2- Litter	6/10	60	6/10	60	3/10	30	3/10	30	1/10	10	19/50	38
3- Feed	4/10	40	3/10	30	1/10	10	1/10	10	1/10	10	10/50	20
4- Water	3/10	30	4/10	40	1/10	10	2/10	20	1/10	10	11/50	22
5- Air	0	0	0	0	0	0	0	0	1/10	10	1/50	2
6- Hand swabs	1/10	10	2/10	20	0	0	0	0	0	0	3/50	6
7- Footboot swab	1/10	10	0	0	0	0	1/10	10	0	0	2/50	4
8- Wall swabs	0	0	2/10	20	0	0	0	0	0	0	2/50	4
9- Fans'swabs	0	0	0	0	1/10	10	1/10	10	0	0	2/50	4
Total	21/90	23.3	25/90	27.8	11/90	12.2	10/90	11.1	6/90	6.7	73/450	16.2

Table (4): Comparsions of Salmonella spp. ferquency in the examined poultry farms

Farms / Sample type	Breeder farm		Layer farm		Broiler farm	
	Total	%	Total	%	Total	%
1- Cloacal swabs	14/50	28	19/50	38	23/50	46
2- Litter	12/50	24	16/50	32	19/50	38
3- Feed	11/50	22	10/50	20	10/50	20
4- Water	9/50	18	7/50	14	11/50	22
5- Air	3/50	6	1/50	2	1/50	2
6- Hand swabs	0	0	0	0	3/50	6
7- Foot boot swabs	2/50	4	1/50	2	2/50	4
8- Wall swabs	4/50	8	2/50	4	2/50	4
9- Fans' swabs	0	0	2/50	4	2/50	4
10- Cage swabs	5/50	10	2/50	4	–	–
11- Egg shell swabs	3/50	6	3/50	6	–	–

Table (5) : Frequency of Salmonella spp. detected from the hatchery

Sample type	Frequency of Salmonella isolation Total no. of +ve/total no.of samples (%)				
	1st Hatchery	2nd Hatchery	3rd Hatchery	Total	%
1- Hatchery interior	2/10	0/10	0/10	2/30	6 7
2- Ventilation outlet	1/10	1/10	1/10	3/30	10
3- Chick box	2/10	2/10	0/10	4/30	13.3
4- Chick sorting area	1/10	2/10	1/10	4/30	13.3
5- Dead inshell	2/10	1/10	2/10	5/30	16.7
6- Egg shell memebrane	1/10	0/10	1/10	2/30	6 7
7- Egg shell fragments	1/10	1/10	0/10	2/30	6 7
8- Egg contents	1/10	1/10	0/10	2/30	6.7
9- Fluff	1/10	1/10	2/10	4/30	13.3

Table (6) : Distribution and serotypes of Salmonella spp. in an integrated poultry operations.

ource	Sample type	No.of samples examined	No.of +ve samples & %	Serovars (No. of isolates)	% of +ve isolates
chery	Egg content	30	4 1 3 . 3 %	S. newport (1)	25
	Fluff	30	5 1 6 7 %	S.newport (2)	40
eder farm	Litter	50	12 24%	S.kentucky (1)	50
	Feed	50	11 22%	S.kottabas (1)	7.7
er farm	Feed	50	1 2 20%	S.kottabus (2)	22.2
	Water	50	7 14%	S.tallahatse (1)	25
iler farm	Litter	50	1 0 3 8 %	S.derbi (1)	6.25
	Feed	50	10 20%	S.typhi (1)	20

REFERENCES

Abaza, I. M.; Shehata, M. A.; Shoieb, M. S. and Hassan, I. I. (2008) : Evaluation of some natural feed additive in growing chick diets. International Journal of Poultry Science. 7 (9): 872-879.

Ahmed, Z. A. M. (1984) : Epidemiological studies on Enterobacteriaceae in poultry farms. M. V. Sc. Thesis. Fac. Vet. Med. Cairo.Univ.

Altrman, B. J. (2002) : Egypt and American Foreign Assistance, 1952-1956: Hopes Dashed. By Jon B. Alterman. (New York: Palgrave, 2002. xxiv, 200 pp., ISBN 0-312-29621-5.) Journal of American History.

Barbour, E. K. and Nabbut, N. H. (1962): Isolation of Salmonella and some other potential pathogens from two chicken breeding farms in Saudi Arabia source. Avian Diseases. 26 (2): 234-244.

Bastawrows, A. F.; Khalil, N. G.; Seddek S. R. and Aly, S. M. (1997): Bacteriological studies on Enterobacteriaceae isolated from table eggs in Assiut. Assiut Vet.Med.J.36 (72): 203-214.

Boklund A.; Mortensen S. and Houe H. (2004) : Biosecurity in 121 Danish sow herds. Acta Vet Scan Suppl.100: 5-14.

Cruickshank, R.; Duguid, J.; Marmion, B. and Swain, R. (1975) : Medical microbiolgy. Text book 12th edition.

Cox, N. A.; Bailey, T. S. and Thomson, J. E. (1983) : Salmonella and other Enterobacteriaceae found in commercial poultry feed. Poultry Science, 62: 2169-2175.

Deng, S. X.; Cheng, A. C.; Wang, M. S. and Cao, P. (2008) : Serovar-specific real-time quantitative detection of Salmonella Enteritidis in the gastrointestinal tract of ducks after oral challenge. Avian Dis. (52): 88-93.

Echeverria, P.; Toylor, D. N.; Seriwatana, J.; Leksomboon, U.; Chaicumpa, W.; Tribat, C. and Rowe, B. (1987) : Potential source of Enterotoxigenic E.coli in homes of childern with diarrhea in Thailand. Bulletin of W.H.O. 65 (2): 207-215.

Hoover N.; Kenney P.; Amick J. and Hypes W. (1997) : Preharvest sources of Salmonella in turkey production. Poultry science, 76: 1232:1238.

Jafari R.; Fazlara A. and Govahi M. (2006) : An investigation into Salmonella and fecal cliform cntamination of dinking water in broiler farms in Iran International Journal of Poultry Science. 5 (5): 491-493.

Jerngklinchan, J.; Koowatananukul, C.; Aengprom, K. and Saitanu, K.(1994) : Occurrenee of Salmonella in raw broilers and their products in Thalland. J. Food Prod. 57: 808-810.

Jones, E. T.; Axtell, R. C.; Rives, D. V.; Scheideler, S. E.; Tarver, E. R.; Walker, Jr., R. L. and Wineland. M. J. (1991) : A survey of Salmonella contamination in modern broiler production. J. Food Prod. (54):502-507.

Kandy Ringer, (2008) : Egypt's media compaign and vaccination drive help drop in Flu rates bird flu infection rates down 40 percent since early. The Communication Initiative Network where communication and media are central to social and economic development.

Kang, H.; Loui, C.; Clavijo, R. I.; Riley L. W. and Lu S. (2006) : Survival characteristics of Salmonella enterica serovar Enteritidis in chicken egg albumen. Epidemiol Infect. 134, (5): 967-976.

Limawongpranee, S.; Ayashidani H.; Katani, A.; Irota, C.; Kaneko, K. and Ogawa. (1999) : Contamination of Salmonella blockley in the environment of a poultry farm. Avian diseases.43 (2): 302-309.

Mason, J. (2006) : Salmonella enteritidis control programs in the United States Epi-

demiol Infect. 134 (5): 967-971.

Mohammad, L. N.; Samaha, H. A.; Draz, A. A. and Hagga, Y. N. (1999) : Salmonellae among birds and human beings. Alex.J.Vet. Sc. 15 (1): 147-154.

Morgan-Jones S. C. (1980) : The occurrenee of Salmonellae during the rearing of broiler birds. British Poultry Science,: 21(6): 463-470.

Namatalla, A. A. (2006) : Shortage in poultry supplies continues despite import legislation. Daily News Sept., 26.

Poppe, C., R. J. Irwin, S. Messier, G. G. Finley and J. Oggel, (1991) : The prevalence of Salmonella enteritidis and other Salmonella spp. among Canadian registered commercial broiler chicken flocks. Epidemiol. Infect., (107): 201-211.

Quinn, P. J.; Carter, M. E.; Markey, B. and Carter, R. (1994) : Clincal veterinary microbiology. Wolfe publishing, Spain.

Roy. P; Dhillon, A. S.; Lloyd H.; Lauerman, D. M.; Schaberg; Randli, D. and Johnson S. (2002): Results of Salmonella isolation from poultry produets, poultry and poultry environment. Avian diseases. (46):17-24.

Sadoma, A. M. (1997) : Salmonella in chicken in eonneetion with human infection.M.V.Sc.Thesis, Fac.Vet. Med. Tanta University.

Sasipreeyajan, J.; Jerngklinchan, J.; Kouwatanamukul, C. & Saitanu, S. (1996) : prevalence of Salmonellae in broiler, layer and breeder flocks in Thailand. Anim.Health. Prod. (8): 174-180.

Suelam, I. I. A. (2003) : Bacteriologieal problems in broiler farms and its relation with productivity. M.V.Se.Thesis. Fac.Vet.Med. Zag. Univ.

USA-FSIS. (1999) : Salmonella serotypes isolated from raw meat and poultry January 26, 1998 to January 25, 1999. Office of Public Health and Science Publication, U.S. Department of Agriculture, Food Safety and Inspection Service, Washington, DC.

Vandeplas, S.; Dubois Dauphin, R.; Beckers, Y.; Thonart, P. and Théwis, A. (2010) : Salmonella in chicken: current and developing strategies to reduce contamination at farm level. J Food Prot. 73(4): 774-85.

Van Hoorebeke, S. A.; Van Immerseel, F.; Schulz, J. C.; Hartung, J.; Harisberger, M. L.; Barco, E.; A. Ricci; E. G.; Theodoropoulos, F.; E., Kylouri; F. J.; De Vylder, B. R., Ducatelle B.; F., Haesebrouck, B.; F. Pasmans, B.; A., de Kruif A. and J. Dewulf (2010) : Determination of the within and between flock prevalence and identification of risk faetors for Salmonella infections in laying hen flocks housed systems. Preventive Veterinary Medicine (94): 94-100.

Wegener, H. C.; Hald, T.; Wong, D. L.; Madsen, M.; Koragaard, H.; Bager, F.; Gerner-Smidt, P. and Molbak, K. (2003) : Salmonella control programs in Denmark. Emerg. Infect. Dis. 9(7): 774-780.

Wiard, T.; Gockley, M.; Parrott, T.; Troyer, G. and Rehberger, T. (2001) : The effect of a biological litter treatment on Salmonella sp. prevalence in turkey breeder flock litter. AMSA, ASAS and PSA, Indianapolis, IN.

Zander, D.; Bermudes, A. J. and Mallinson, E. T. (1997) : Principles of disease prevention : Diagnosis and control. Disease of poultry : 10th ED. Edited by Calnek, B. W.; Barnes,e.w.; Beard, l.r.; McDouglad and Saif, Y.M.Iowa State University, Press, Ames. U.S.A.

الملخص العربى

دور إجراءات الأمن الحيوى فى السيطرة على بعض الميكروبات الممرضة ذات الأهمية المشتركة فى مزارع الدواجن

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قسم الصحة والأمراض المشتركة - كلية الطب البيطرى - جامعة المنصورة

قسم الصحة والأمراض المشتركة - كلية الطب البيطرى - جامعة بنى سويف

أجريت هذه الدراسة على عدد من مزارع الدواجن (أمهات، بياض، تسمين بالإضافة إلى مفرخ) وذلك لتقييم إجراءات الأمن الحيوى الموجودة فيها عن طريق تقييم بعض أوجه إنتشار وتوزيع بعض الميكروبات ذات الأهمية للأمن الحيوى مثل السالمونيلا، هذا الميكروب يستخدم كنموذج لتقييم تلك الإجراءات تم تجميع عينات من المفترخ، الطيور والبيئة المحيطة بها بغرض عزل وتصنيف ميكروب السالمونيلا، وقد وجدنا أن معدل عزل ميكروب السالمونيلا حقق أعلى نسبة له فى مزارع التسمين بنسبة 16.2% ويتبعه تلك النسبة المعزولة من مزارع البياض والأمهات 11.5% لكلا منهما، تم تصنيف الميكروبات المعزولة وعزلت كلا من سالمونيلا كنتاكى، نيوبورت، كنتوس، تلاهاتسى، تيفاى ودربى بمعدل 50%، 40، 22.2، 25، 6.25، 20 على التوالى. إن لحقيق أقل معدل عزل فى مزرعة الأمهات مقارنة بمزرعتى البياض والتسمين يعكس ضرورة تطبيق الأمن الحيوى للحفاظ على المزارع من دخول تلك الأمراض وغيرها.