# Incidence of coagulase positive *Staphylococcus aureus* in poultry and related human

**Heba, Badr*, Mona, I. H. El-Enbaawy** and Soad, A. Nasef***
*National Laboratory For veterinary Quality control on poultry production, Dokki-Giza; ** Bacteriology department in Veterinary Medicine, Cairo University.

**Abstract**
A total of 296 samples were examined bacteriologically for detection of ***Staphylococcus aureus*****,** 59 samples were positive for coagulase positive ***S.aureus***, with a total prevalence of 19.9 %. The prevalence among diseased chickens was 16.7 %. While, 18.8% of broiler farms, 26.7 % of layer farms, 12 % of Giza abattoirs and19.7 % of imported frozen chickens were positive. The high percentage of coagulase positive ***S.aureus*** in diseased chickens was isolated from joint (35.7 %) while, no positive results were obtained from abscesses and eggs samples. We could conclude that ***S. aureus*** organism was widely distributed in human related to these poultry which illustrated in this isolated strains from hand swabs in broiler farms with 14.8% (4/27), layer farms with 43.8% (8/23), 25% (2/8) from Giza abattoirs.

***Key words:*** *S.aureus, coagulase positive, Giza abattoirs.*

## Introduction

***Staphylococcus aureus*** has been tested in meat and poultry products to assess microbiological safety, sanitation conditions during processing and storage quality of products **(Tompkin, 1983).** ***S. aureus*** is an important cause of disease in poultry. It can be involved in a wide range of clinical conditions such as septicemia, bone and joint infections, abscesses and dermatitis **(Jordan and pattison, 1996).** Proximal femoral degeneration (PFD), mediated mainly by ***S.aureus***, is the most common cause of lameness in broiler**,** such disease compromises animal welfare and causes economic loss through death, reduced productivity on the farm, and carcass condemnations at the processing plant **(McNamee *et al.*, 1998)**. A national survey in the US estimated that leg problems cost the broiler industry between 80 and 120 million dollars annually **(Morris, 1993)**.

***Staphylococcus aureus*** is often found closely associated with the human body and may be also found in many parts of his environment (dust, water, air, faeces and on clothes or utensils) **(Bremer *et al.*, 2004)**.

In human pathogen, the disease associated with ***S.aureus*** varies in the severity from superficial, skin infection to the more life – threatening, systemic illnesses **(White *et al.*, 2003)**.

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

Poultry meat is a common vehicle of food borne illness, ***S.aureus*** usually being one of the causes of outbreaks involving large number of peoples **(Georgnaras and Von Holy, 2001)**.

The goal of the present study was to perform a screening survey as well as phenotypic characterization of ***S. aureus*** isolated from diseased and apparently healthy chickens as well as the related workers.

## Materials and Methods

### Samples:

From different Governorates (Giza, Cairo, El-Dakahlia, El-Behara, El-Sharkia, Alexandria, El-Menia, Demiate, Esmalia, El-Gharbia, El-Kaliobia) and Giza abattoirs, a total of 296 different samples from diseased and apparently healthy chickens and their related human samples were collected to be examined. Those were 144 pooled samples (48 drag swabs or cloacal swabs, 46 tracheal swabs, 50 worker hand swabs) from different farms of apparently healthy chickens broiler and layer, 66 samples

from different organs (joint, liver, lung, abscess, ovary and egg) of diseased chickens, 61 samples (skin and muscle) from imported frozen chickens and 25 pooled samples (skin, lung, liver and worker hand swabs) from Giza abattoirs.

**Methods:**

All samples used were collected under aseptic conditions and safety precautions. **(Lee, 2003; Kitai *et al.*, 2005** and **Middleton *et al.*, 2005)**

**Isolation and identification of *Staphylococcus aureus* was done according to (Sneath *et al.*, 1986).**

- Pre-enriched in buffered peptone water and then incubated at 37˚C for 24 hrs under aerobic conditions. Then inoculated on to blood agar, and then incubated for 24 hrs at 37˚C. Colonies were examined for morphological characteristic appearance of ***Staphylococcus spp.*** **(Swayne *et al.*, 1998)**.
- To differentiate ***S.aureus*** from other ***Staphylococcus spp.*** Also inoculated on selective medium; mannitol salt agar (MSA) which was incubated at 37˚C for 24 hrs and Baird Parker's agar (BP) medium which was incubated at 37˚C for 24-48 hrs.

Typical or suspected colonies were picked and plated on the TSA medium.

**Biochemical tests and characteristic features for identification of *S.aureus* from other species of *Staphylococci* (Sneath *et al.*, 1986):**

Colony diameter <5 mm, Colony pigment (carotenoid) with Aerobic growth, Slide catalase test (+ve), Oxidase test (-ve), Mannitol fermentation(+ve), Tellurite reduction (+ve), Haemolysis (+ve) and most strains of ***S.aureus*** were β-haemolytic, Slide and tube Coagulase test (+ve) and Acetoin production (VP) (+ve) .

**Results**

**1- Total Prevalence of coagulase positive *S.aureus* from chickens and related human under test.**

**Table (1)** clarified that, out of 296 samples collected from different types of chickens with related human samples, 19.9 % of the samples were coagulase positive ***S.aureus*** (59/296), Coagulase positive ***S.aureus*** revealed from 16.7 % (11/66) of diseased chickens, 18.8% (13/69) of broiler farms, 26.7 % (20/75) of layer farms, 12 % (3/25) of Giza abattoirs and 19.7 % (12/61) of imported frozen chickens.

**2- Prevalence of coagulase positive *Staphylococcus aureus* in different organs of diseased chickens.**

As shown in **Table (2)** the isolated coagulase positive ***S.aureus*** was from Joints, Livers, Lungs and Ovaries. The result revealed that on examination of 66 samples collected from diseased chickens' samples from different Governorates in Egypt, coagulase positive ***S.aureus*** was isolated in prevalence of 16.7 % (11/66). 35.7 % (5/14) was from joints, while, it was 23.5% (4/17) from Livers, 25 % (1/4) from Lungs and 20 % (1/5) from Ovaries.

**3-Prevalence of coagulase positive *Staphylococcus aureus* from broiler farms in different swabs samples.**

Regarding examination of 69 samples collected from chickens of broiler farms (apparently healthy) from different Governorates for

**Table (1).** Total Prevalence of coagulase positive *S.aureus* from chickens and related human under test.

| Sources | No. of examined samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| Diseased chickens | 66 | 11 | 16.7 |
| Broiler farms | 69 | 13 | 18.8 |
| Layer farms | 75 | 20 | 26.7 |
| Giza abattoirs | 25 | 3 | 12 |
| Imported frozen chickens | 61 | 12 | 19.7 |
| Total | 296 | 59 | 19.9 |

***S.aureus***, as shown in **Table (3)**. The overall isolated coagulase positive ***S.aureus*** was 13 with the percentage of 18.8 % which was related to drag swabs 22.7 % (5/22), tracheal swabs 20% (4/20) and hand swabs of workers 14.8 % (4/27).

**4-Prevalence of coagulase positive *Staphylococcus aureus* from layer farms in different swabs samples.**

On examination of 75 samples collected from layer farms in different Governorates, it was found that, 20 samples were positive for coagulase positive ***S.aureus*** with percentage of 26.7 % which, resulted from 19.2 % (5/26) of drag swabs, 27 % (7/26) of tracheal swabs and 34.8 % (8/23) of hand swabs of workers as Shown in **Table (4).**

**5-Prevalence of coagulase positive *Staphylococcus aureus* from Giza abattoirs.**

**Table (5)** illustrated that out of 25 samples colloected from Giza abattoirs 3 samples were coagulase positive ***S.aureus*** with the percentage of 12%. The isolated percent from hand swabs of the workers was 25 % (2/8) and 16.7 % (1/6) from chicken lung samples, while, no positive results were observed from skin and liver samples of chickens.

**6-Prevalence of coagulase positive *Staphylococcus aureus* from imported frozen chickens**.

As shown in **Table (6),** out of 61 samples collected from imported frozen chickens 12 (19.7 %) were coagulase positive ***S.aureus*** representative to 16.1 % (5/31) from skin samples and 23.3 % (7/30) from muscle samples.

**Table (2)**. Prevalence of coagulase positive *Staphylococcus aureus* in different organs of diseased chickens.

| Organs | Number of examined samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| **Joints** | **14** | **5** | **35.7** |
| **Livers** | **17** | **4** | **23.5** |
| **Lungs** | **4** | **1** | **25** |
| **Abscesses** | **5** | **0** | **0** |
| **Ovaries** | **5** | **1** | **20** |
| **Eggs** | **21** | **0** | **0** |
| **Total** | **66** | **11** | **16.7** |

**Table (3).** Prevalence of coagulase positive *Staphylococcus aureus* from broiler farms in different swabs samples.

| Type of Samples | Number of examined Samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| **Drag swabs** | 22 | 5 | 22.7 |
| **Tracheal swabs** | 20 | 4 | 20 |
| **Hand swabs** | 27 | 4 | 14.8 |
| **Total** | **69** | **13** | **18.8** |

**Table (4).** Prevalence of coagulase positive *Staphylococcus aureus* from layer farms in different swabs samples.

| Type of samples | Number of examined samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| Drag swabs | 26 | 5 | 19.2 |
| Tracheal swabs | 26 | 7 | 27 |
| Hand swabs | 23 | 8 | 34.8 |
| Total | 75 | 20 | 26.7 |

**Table (5).** Prevalence of coagulase positive *Staphylococcus aureus* from Giza abattoirs.

| Type of samples | Numbers of samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| Skin | 5 | 0 | 0 |
| Lung | 6 | 1 | 16.7 |
| Liver | 6 | 0 | 0 |
| Hand swabs | 8 | 2 | 25 |
| Total | 25 | 3 | 12 |

**Table (6).** Prevalence of coagulase positive *Staphylococcus aureus* from imported frozen chickens.

| Type of samples | Number of pooled samples | Coagulase positive *S.aureus* | |
|---|---|---|---|
| | | No. | % |
| Skin | 31 | 5 | 16.1 |
| Muscle | 30 | 7 | 23.3 |
| Total | 61 | 12 | 19.7 |

## Discussion

***S. aureus*** infection has become an increasingly grave problem in industrialized poultry farming **(Bergmann *et al.*, 1980).** The present study tries to illustrate the problem of ***S.aureus*** in poultry and correlated human dealing with them.

***S. aureus*** expresses many potential **virulence factors**: (1) Surface proteins that promote colonization of host tissues. (2) Invasions that promote bacterial spread in tissues (**leukocidin, kinases, hyaluronidase**). (3) Surface factors that inhibit phagocytic engulfment (**capsule, Protein A**). (4) Biochemical properties that enhance their survival in phagocytes (**carotenoid, catalase production**). (5) Immunological disguises (**Protein A, coagulase, clotting factor**). (6) Membrane-damaging toxins that lyse eukaryotic cell membranes (**hemolysins, leukotoxin, leukocidin**). (7) Exotxins that damage host tissues or otherwise provoke symptoms of disease (**SEA-G, TSST, ET**). (8) Inherited and acquired **resistance to antimicrobial agents**. **(Toder, 2005).**

In our results out of 296 samples collected from different types of chickens with related human samples, 19.9 % of the samples were coagulase positive ***S.aureus*** (59/296), Coagulase positive ***S.aureus*** revealed from 16.7 % (11/66) of diseased chickens, apparently healthy chickens 18.8% (13/69) of broiler farms and 26.7 % (20/75) of layer farms, 12 % (3/25) of Giza abattoirs and 19.7 % (12/61) of imported frozen chickens. Similar to us, **Elghaffar *et al.* (2004)** who examined 48 samples from infected chickens 17 cases were positive for bacterial infection (14 for ***S. aureus*** with an incidence of 29.2%. while in apparently healthy chickens were supported by **Harry (1967)** who isolated ***S.aureus*** from the skin and nasopharynx of 49 % samples out of 276 birds. On the other hand **Lee (2003)** collected samples from meat, faeces, feet, joint and trachea of chickens, and isolated ***S.aureus*** from each sample in the percentage of 9/69 (13%), 2/35 (5.7%), 4/36 (11.1%), 33/119 (27.7%) and 5/37 (13.5%), respectively. Recently, **Moustafa (2005)** isolated 2 ***S.aureus*** out of 150 bacterial isolates which were isolated from the sinous and the upper respiratory tract of broilers in Assuit farms.

In present work the isolated coagulase positive ***S.aureus*** was from Joints, Livers, Lungs and Ovaries, revealed that on examination of 66 samples collected from diseased chickens' samples in Egypt, with prevalence of 16.7 % (11/66). The high percent 35.7 % (5/14) was from joints, while, it was 23.5% (4/17) from Livers, 25 % (1/4) from Lungs and 20 % (1/5) from Ovaries. That as **Lua *et al.* (1994)** col-

lected samples from chickens type broiler breeder in four outbreaks of swollen head syndrome (SHS) in Taiwan. ***S.aureus*** was isolated from lung, liver, spleen and kidney of affected chickens. **Nairn (1973)** mentioned that ***S.aureus*** was the most commonly isolated from the joints, tendon sheaths and bones of infected chickens and turkeys.

In contrary to the negative results of isolation **of *S.aureus*** from abscesses and eggs, **Sabreen (2001)** collected a total of 225 random eggs in Assiut Governorate (Egypt), included commercial hens' eggs of both native breeds, poultry farms and ducks' eggs. The eggs were examined for the presence of some pathogenic bacteria; ***S. aureus*** was existed in 26.7, 26.7 and 20% of egg shells of hens of both native breeds and poultry farms and ducks, respectively. However, only two samples (13.3%) of commercial hens' egg contents of the native breeds were positive for ***S. aureus***. While, **Mohamed (2006)** isolated ***S. aureus*** from chicken musculoskeletal abscess in a percent of 8%.

Regarding examination of 69 and 75 samples collected from broiler and layer farms (apparently healthy) for isolated coagulase positive ***S.aureus*** was 13 and 20 with the percentage of 18.8 % and 26.7 %, respectively. Revealed from 22.7 % (5/22), 20% (4/20) and 14.8 % (4/27) in broiler farms. While, layer farm is 19.2 % (5/26), 27 % (7/26) 34.8 % (8/23), resulted from drag swabs, tracheal swabs and hand swabs of workers, respectively. Nearly to our results were those obtained by **Cotter and Taylor (1987)** who found 25 % recovery of coagulase positive ***S.aureus*** from 294 rectal swabs obtained from healthy hens in laying period**.** Similarly, microbial analysis of poultry faeces was carried out by **Adegunloye (2006)**, in two different poultry farms in Akure using standard method ***S.aureus*** were isolated.

It is interesting to note that coagulase positive ***S.aureus*** was isolated from the workers ′hand swabs of broiler and layer farms, that comes parallel with **Chambers (2001)** who concluded that humans were a natural reservoir for ***S.aureus***, and asymptomatic colonization was far more common than infection. Colonization of the nasopharynx, perineum, or skin, particularly if the cutaneous barrier had been disrupted or damaged, might occur shortly after birth and might recur anytime there after.

Our results illustrated that out of 25 samples collected from **Giza abattoirs** 3 samples were coagulase positive ***S.aureus*** with the percentage of 12%. The isolated percent from hand swabs of the workers was 25 % (2/8) and 16.7 % (1/6) from chicken lung samples, while, no positive results were observed from skin and liver samples of chickens. On the other hand out of 61 samples collected from **imported frozen chickens** 12 (19.7 %) were coagulase positive ***S.aureus*** representative to 16.1 % (5/31) from skin samples and 23.3 % (7/30) from muscle samples.

Similar to us, samples were taken from slaughtered bird for which ***S. aureus*** was isolated from the lung tissue .The most frequently occurring species were *S. epidermidis* (23.7%) and ***S. aureus*** in a percent of 15.4%. While, 57% of the swabs taken from the gloves and the hands and 42% from the aprons of the personnel were ***S. aureus*** positive **(Raus and Love, 1983).** Also, Microbiological analysis is performed on 66 samples of fresh, retail-cut chicken meat (21 samples of chicken breasts without skin- "fillet", and 19 samples of chicken breasts with skin) and frozen ground chicken meat (26 samples). ***S.aureus*** 30.3 % is distributed in chicken breasts without skin- "fillet" 46.15 %, chicken breasts with skin 28.75 % and 10.53 % from frozen ground chickens **(Kozačinski *et al*., 2006).**

However ***S. aureus*** was found in 86.6% of swab samples obtained from infected workers, in 40% of swabs from hands of workers who handle bruised birds, and in 38.7% of bruised tissues, and was absent in all samples obtained from hands of workers who did not handle bruised birds **(Roskey and Hamdy**, **1972)**. These results indicated that poultry bruises are a source of Staphylococcal infection encountered among poultry workers. On reverse**,** poultry meat has been frequently associated with food borne illness in which initial contamination is traceable to food handlers by ***S.aureus***

**(Halpin- Dohnalek and Marth, 1989).**

Many studies like **(Hentschel *et al.*, 1979; Lukasova *et al*., 1986; Bertolatti *et al*., 2003 and Tsola *et al*., 2008)** have been related to poultry slaughter houses modernization and updating of food safety management systems and microbiological quality and safety of products.

Contrary to the results of skin **Kawano *et al*. (1996)** attempted to isolate ***S.aureus*** strains from the nares and skin of 130 chickens. ***S.aureus*** strains were isolated from 103 (79.2%) of the 130 chickens. In Japan, **Kitai *et al.* (2005)** examined a total of 444 samples of raw chicken meat (thighs, breasts, wings, livers, gizzards, hearts and ovaries) that retailed at 145 different supermarkets. ***S. aureus*** was isolated from 292 (65.8%) of samples. In Saudi Arabia to evaluate the hygiene and safety quality of frozen chickens from Al-Hassa supermarkets. Results revealed that the number of *Enterobacteriaceae* and ***S. aureus*** on the imported frozen chickens is significantly lower than that of the locally produced one **(Zeitoun and Al-Eid, 2003)**

Contamination of poultry carcasses with ***S.aureus*** has many sources. It is shown that the increase in contamination is due to a strain of ***S. aureus*** which is indigenous to the processing plant. Plucking and evisceration appeared to be the main stages at which contamination of carcases with ***S. aureus*** occur **(Notermans *et al.*, 1982)**.

From the all discussed results we could concluded that ***S. aureus*** organisms were widely distributed in all poultry sectors and human related to these poultry. It might produce different diseased cases in poultry which may lead to contamination of the final products.

## References

**Adegunloye, D.V. (2006).** Microorganisms associated with poultry faeces. J. Food, Agri. Environ., 4(1). 41-42.

**Bergmann, V.; Kohler, B. and Vogel, K. (1980).** ***Staphylococcus aureus*** infection in chickens in industrialized poultry units. 1. Manifestations of ***Staphylococcus aureus*** infection in chickens. Arch. Exp. Vet. Med., 34(6).891-903.

**Bertolatti, D.; O'Brien, F. G. and Grubb, W. B. (2003).** Characterization of drug-resistant ***Staphylococcus aureus*** isolated from poultry processing plants in Western Australia. Int. J. Environ. Health Res., 13(1).43-54.

**Bremer, P.J.; Fletcher, G.C. and Osbame, C. (2004).** ***Staphylococcus aureus***, Newzealand Institute for Crop and Food Research Limited, 1-6. Sited in, www.crop.Cri.nz/home/research/marine/pathogens/staphylococcus.pdf-

**Chambers, H. F. (2001).** The changing epidemiology of Staphylococcus aureus. CDC, Emer. Infec. Dis., 7(2). 1-10.

**Cotter, P. F. and Taylor, R. L. (1987).** ***Staph.aureus*** carriage in commercial layers. Poultry Sci., 66(1). 86.

**Elghaffar, S. K. A.; Abd-Elgwad, A. M.; Hebat-All and Mohamed, A. (2004).** Etiological and morphological studies on infectious leg weakness in commercial broiler flocks. Assiut Vet. Med. J., 50(100). 188-202.

**Georgnaras, I. and Von Holy, A. (2001).** Antimicrobial susceptibilities of isolates of ***Staphylococcus aureus,*** Listeria species and Salmonella serotypes associated with poultry processing. Int. J. Food Microbiol., 70(1/2). 29-35.

**Halpin-dohnalek, M. I. and Marth, E. H. (1989).** ***Staphylococcus aureus***: production of extracellular compounds and behavior in foods. J. Food Prot., 52:267-282.

**Harry, E. G. (1967).** The characteristics of ***Staphylococcus aureus*** isolated from cases of ***Staphylococcosis*** in poultry. Res. Vet. Sci., 8:479-489.

**Hentschel, S.; Kusch, D. and Sinell, H. J. (1979).** ***Staphylococcus aureus*** in poultry biochemical characteristics, antibiotic resistance and phage pattern (author's transl). Zentralbl Bakteriol [B], 168(5-6).546-561.

**Isigidi, B. K.; Mathieu, A.; Devriese, L. A.; Godard, C. and Van Hoof, J. (1992).** Enterotoxin production in different ***Staphylococcus aureus*** biotypes isolated from food and meat plants. J. Appl. Bacteriol., 72:16-20.

**Jordan, F. T. W and Pattison, M. (1996).** Poultry diseases, 4th ED. Saunders, London, 66-69.

**Kawano, J.; Shimizu, A.; Saitoh, Y.; Yagi, M.; Saito, T. and Okamoto, R. (1996).** Isolation of methicillin resistant coagulase negative ***Staphylococci*** from chickens. J. Clin. Microbiol., 34(9). 2072-2077.

**Kitai, S.; Shimizu, A.; Kawano, J.; Sato, E.; Nakano, C.; Uji, T. and Kitagawa, H. (2005).** Characterization of methicillin-resistant ***Staphylococcus aureus*** isolated from retail raw chicken meat in Japan. J. Vet. Med. Sci., 67(1). 107-110.

**Kozačinski, L.; Hadžiosmanovič, M. and Zdolec, N. (2006).** Microbiological quality of poultry meat on the Croatian market, Veterinarski Arhiv, 76 (4). 305-313.

**Lee, J. H. (2003).** Methicillin (Oxacillin)-resistant ***Staphylococcus aureus*** strains isolated from major food animals and their potential transmission to humans. Appl. Environ. Microbiol., 69(11).6489-6494.

**Lua, Y. S.; Shien, Y. S.; Tsai , H. J.; Tseng, C. S. ; Lee, S. H. and Lina, D. F. (1994).** Swollen head syndrome in Taiwan-isolation of an avian pneumovirus and serological survey. Avian Pathol., 23(1).169 – 174.

**Lukasova, J.; Mickova, V. and Pchalek, J. (1986).** Characteristics of ***Staphylococcus aureus*** strains, isolated from slaughtered poultry. Zentralbl Mikrobiol., 141(3).163-168.

**McNamee, P.T.; McCullagh, J.J.; Thorp, B. H.; Ball, H.J.; Graham, D.; McCullough, S.J.; McConaghy, D. And Smyth, J. A. (1998).** Study of leg weakness in two commercial broiler flocks. Vet. Rec., 143(5).131-135.

**Middleton, J. R.; Fales, W. H.; Luby, C. D.; Landsay Oaks, J.;Susan Sanchez; Kinyon, J. M.; Wu, C. C.; Maddox, C. W. and Hartmann, F. (2005).** Surveillance of Staphylococcus aureus in veterinary teaching hospitals. J. Clin. Microbiol., 43(6). 2916-2919.

**Mohamed, E. A. E. (2006).** Characterization of ***Staphylococcus aureus*** isolated from different sources with special reference to protein A. Thesis for the Master degree in Vet. Sci., Cairo university.

**Morris, M. P. (1993).** National survey of leg problems. Broiler Industry, 93(5). 20– 24.

**Moustafa, F. A. M. (2005).** Some studies on bacterial causes associated with cases of swollen head syndrome in chickens. Assiut Vet. Med. J., 51(104). 193-211.

**Nairn, M. E. (1973).** Bacterial osteomylitis and synovitis of the turkey. Avian Dis., 17:504-517.

**Notermans, S.; Dufrenne, J. and van Leeuwen W. J. (1982).** Contamination of broiler chickens by ***Staphylococcus aureus*** during processing; incidence and origin. J. APPl. Microbiol., 52 (2). 275-280.

**Raus, J. and Love, D. N. (1983).** Characterization of coagulase-positive *Staphylococcus intermedius* and ***Staphylococcus aureus*** isolated from veterinary clinical specimens. J. Clin. Microbiol., 18:789-792.

**Roskey, C. T. and. Hamdy, M. K. (1972).** Bruised Poultry Tissue as a Possible Source of Staphylococcal Infection**.** Appl. Environ. Microbiol., 23(4). 683-687**.**

**Sabreen, M.S. (2001).** Search for some pathogenic bacteria in commercial hens and ducks' eggs sold in Assiut Governorate. Assiut Vet. Med. J., 45(89). 91-103.

**Sneath, P. H. A.; Mair, N. S.; Elisabeth Sharpe, M.; Holt, J.G.; Murray, R. G. E.; Chairman; Brenner, D.J.; Bryant, M.P.; Krieg, N.R.; Moulder, J.W.; Pfennig, N.and Staley, J. T.(1986).** Section 12 gram-positive cocci, Bergey's Manual of Systemic Bacteriology, Vol. 2, Williams and Wilkins.USA.

**Swayne, D.E; Charman; Glisson, J. R; Jackwood, M.W; Pearson, J. E and Reed, W.M. (1998).** ***Staphylococcosis***, A laboratory manual for the Isolation and identification of avian pathogens, fourth edition. Am. Assoc. Avian Pathol.

**Toder, K (2005).** ***Staphylococcus***: toder's online textbook of bacteriology. Sited in, www.textbookofbacteriology.net/staph.htm1.

**Tompkin, R. B. (1983).** Indicator organisms in meat and poultry products. Food technol.,

37:107-110.

**Tsola, E.; Drosinos, E. H. and Zoiopoulos, P. (2008).** Impact of poultry slaughter house modernization of food safety management systems on the microbiological quality and safety of products. Food Control, 19: 423–431.

**White, D. G.; Ayers, S.; Maurer, J. J.; Thayer, S. G. and Hofacre, C. (2003).** Anti-microbial susceptibilities of ***Staphylococcus aureus*** isolated from commercial broilers in Northeastern Georgia. Avian Dis., 47(1). 203 -210.

**Zeitoun, A. A. and Al-Eid, S. M. (2003).** The safety and quality of frozen poultry at Al-Hassa supermarkets. Sitted in, www.Kfu.edu.sa/Main/res/3014-Pdf.

## معدل وجود الميكروب العنقودى الذهبى فى الدواجن والعاملين المخالطين لها

***هـبـــه بـــدر محمـود و **منى ابراهيم حسن الانبعاوى و* سعاد عبد العزيز عبد الونيس ناصف**

*المعمل القومي للرقابة – معهد بحوث صحة الحيوان –وزارة الزراعة – الدقي – الجيزة، ** استاذ دكتور بوحدة البكتريولوجى-كلية الطب البيطرى-جامعة القاهرة.

**الملخص العربى**

من الفحص البكتيرى لعدد 296 عينة تم عزل 59 عينة للميكروب العنقودى الذهبى بنسبة 19.9% وهذا من عينات دجاج مريض بنسبة 16.7% بينما 18.8%و 26.7% و12% و19.7% من مزارع الدجاج التسمين ومزارع الدجاج البياض ومجازر بالجيزة والدجاج المستورد المجمد، بالتوالى. وكانت اعلى نسبة للميكروب العنقودى الذهبى من الدجاج المريض المعزولة من المفاصل بنسبة 35.7%. ووجد ان جميع عينات البيض والدجاج المصاب بالصديد سلبى للميكروب العنقودى الذهبى. ووجد من ذلك ان الميكروب العنقودى الذهبى منتشر فى العاملين والمخالطين بالدجاج الموضحة من المعزولات الناتجة من مسحات الايدى من مزارع التسمين بنسبة 14.8 % (4/27), ومن مزارع البياض بنسبة 43.8% (8/23) و 25% (2/8) من مجازر بالجيزة.