

# THE INDIAN VETERINARY JOURNAL

SINCE - 1924

**Journal of the  
INDIAN VETERINARY ASSOCIATION**  
ESTD - 1922 Regd. No. Sl. No. 96/1967 (CHENNAI)



No. 11, Pasumpon Muthuramalinga Thevar Salai (Chamiers Road),  
Nandanam, Chennai - 600 035, Tamil Nadu, India  
Tel. : +91 44 2435 1006  
Email : [ivj83@yahoo.com](mailto:ivj83@yahoo.com)  
ONLINE : [www.ivj.org.in](http://www.ivj.org.in)

**THE INDIAN VETERINARY JOURNAL**  
(Official Organ of the Indian Veterinary Association)

**EDITORIAL COMMITTEE**

**Dr A.V. KRISHNAN, Chief Editor**

B.V.Sc., M.V.Sc (Path.)

Retd. Additional Director of A.H., TN

**Dr S. SUKUMAR, Managing Editor**

B.V.Sc., M.V.Sc (Vet. Micro), Ph.D. (Biotech)

Retd. Professor of Biotechnology, TANUVAS, TN

**Dr V. Titus George, Editor**

B.V.Sc., M.V.Sc., Ph.D. (Patho)

Retd. Prof. of Pathology, TANUVAS

**Dr I. Ponnu Pandian, Editor**

B.V.Sc., PGDAEM

**Dr K. Venukopalan, Editor**

B.V.Sc., M.V.Sc., Ph.D. (Poul.)

Retd. Prof. of Poultry Science, TANUVAS

**EDITORIAL BOARD**

**CHAIRMAN**

**Dr. Chirantan Kadian**

B.V.Sc & A.H.

**President, Indian Veterinary Association**

**MEMBERS**

**Prof. Dr C. Balachandran**

M.V.Sc, Ph.D., PGDAJ, PGDEVP, DICVP

FAO Fellow, FIAVP, FNAVS, FASAW

Vice-Chancellor

Tamilnadu Veterinary and Animal Sciences University  
Madhavaram Milk Colony, Chennai - 600 051.

**Dr. P.K. Panwar**

BVSc & AH, MVSc,

Department of Animal Husbandry  
Uttar Pradesh

**Dr. Subhash Chander Ahlawat**

BVSc & AH.

Department of Animal Husbandry  
Haryana

**MANAGING COMMITTEE OF  
INDIAN VETERINARY ASSOCIATION**

**President :**

Dr. Chirantan Kadian

**Secretary General :**

Dr. R.S. Patel

**Treasurer :**

Dr. I. Ponnu Pandian

**Joint Secretary :**

Dr. M.K. Srikanth

**Vice Presidents :**

Dr. L. Chandrasekaran, HQ, Tamilnadu

Dr. Arun Sirkeck, Himachal Pradesh

Dr. S.G. Yalagod, Karnataka

Dr. Ilang, Nagaland

Dr. Ramji Lal Meena, Rajasthan

Dr. Sudhir Kumar, Uttar Pradesh

**Zonal Secretaries :**

Dr. Amit Nain, Punjab

Dr. R. Vasantha Rayalu, Andhra Pradesh

Dr. Bhuban Ch. Sarmah, Assam

Dr. Umesh Balaji Sontakke, Maharashtra

Dr. Pankaj Kumar, Jharkhand

**Managing Editor, IVJ :**

Dr. S. Sukumar, Tamil Nadu

# THE INDIAN VETERINARY JOURNAL

(Official organ of the Indian Veterinary Association)

Vol. 96

November 2019

No. 11

## CONTENTS

### GENERAL ARTICLES :

<b>Seasonal Variations on the Frequency of Normal Motile and Static Ejaculates and their Discard Rate in Murrah Buffalo Bulls</b> Kanchan	... 09
<b>Performance of Bali Cattle (<i>Bos Sondaicus</i>) Breeding Stock in Maliku District, Pulang Pisau Regency, Central Kalimantan</b> Maria Haryulin Astuti	... 12
<b>Enriching Cow Milk with Selenium through the Use of Selenoorganic Preparations</b> Yuriy Nikolayevich Prytkov and Anna Aleksandrovna Kistina	... 15
<b>Immunological and Morphological Indicators of Nonspecific Resistance in Laying Hens that Received the Vilomix Feed Additive</b> Arman Sabyrzhanov, Orazali Mullakaev, Ildar Zalyalov, Evgeny Kirillov, Kaissar Kushaliyev and Abzal Kereyev	... 19
<b>Identification and Morphological Characteristic of Ornamental Fish in Wongsorejo Beach, Banyuwangi, East Java, Indonesia</b> Mohammad Faizal Ulkhaq, Annur Ahadi Abdillah, Daruti Dinda Nindarwi, Hapsari Kenconoajati, Darmawan Setia Budi, Suciyono and Muhammad Browijoyo Santanumurti	... 24
<b>Antibiotic Resistance to <i>Staphylococcus aureus</i> and Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) Isolated from Dairy Farms in Surabaya, Indonesia</b> Wiwiek Tyasningsih, Mustofa Helmi Effendi, Budiarto Budiarto and Indra Raja Syahputra	... 27
<b>Detection of <i>Salmonella</i> on Chicken Meat Using Immunomagnetic Separation and Conventional Methods from Traditional Market in Surabaya, East Java, Indonesia</b> Dhandy Koesoemo Wardhana, Muhammad Thohawi Elziyad Purnama, Ooi Hong Kean and Wiwiek Tyasningsih	... 31
<b>Reconstruction of Circular Skin Defect with Single Pedicle Advancement Flap in a Dog</b> M. Madeena Begum and V. Bhuvaneshwari	... 33
<b>Efficiency of W Chromosome- Based Gender Determination in Japanese Quails</b> Tamadhur H. Hussein, Mohammed Baqur S. Al-Shuhaib and Tahreer M. Al-Thuwaini	... 36
<b>Carcass Quality of Broiler Supplemented with <i>Spirulina</i>, Kelor Leaves (<i>Moringa olifera</i>), and Probiotic</b> Herinda Pertiwi, Romziah Sidik, Emy Koestanty Sabdoningrum and Tri Bhawono Dadi	... 39
<b>Diagnosis of Single and Twin Pregnancy, and Early Embryo Mortality Through Progesterone Level Test on Local Does</b> Wurlina, Imam Mustofa, Mas'ud Hariadi, Erma Safitri and Dewa Ketut Meles	... 42

<b>Prevalence Study on Gastrointestinal Motility Disorders in Cattle Brought to Teaching Veterinary Hospital at Namakkal, Tamil Nadu</b>	...	45
B.Sudhakara Reddy, G.Vijayakumar, S.Sivaraman, G.A.Balasubramaniam and S.Kathirvel		
<b>Functional Specialization of Forelimb Muscles of Sloth Bear (<i>Melursus ursinus</i>)</b>	...	47
V.R. Annie, Shruti., K.V. Jamuna., S.A. Arun., R.V. Prasad and V. Girishkumar		
<b>Characterization and Identification of <i>Aeromonas salmonicida</i> subsp. <i>salmonicida</i> Isolated from Fresh Water Fish <i>Clarias batrachus</i></b>	...	50
Windi Andhini, Sudarno, Rahayu Kusdarwati and Rozi		
<b>Improvement of Pregnancy Rate in Bali Cows with the Combination of Equine Chorionic Gonadotropine (eCG) from Local Pregnant Mare with PGF2<math>\alpha</math></b>	...	52
Herry A. Hermadi, R.T.S. Adikara, Sunaryo H. Warsito and Erma Safitri		
<b>Micro Anatomical Studies on the Moderator Band of Spotted Deer (<i>Axis axis</i>)</b>	...	55
O.R.Sathyamoorthy, S.Ushakumary and M.Thangapandian		
<b>Nano Spray Inhaler Ashitaba Leaf Extract (<i>Angelica keiskei</i>) on Malondialdehyde, Catalase Enzyme Activity and Lung Tissue Damage in Mice Exposed to Cigarette Smoke</b>	...	58
Akhmad Afifudin Al-Anshori, Diah Ayu Retanti, Indah Trilestari, Lilik Maslachah and Hani Plumeriastuti		
<b>Nematodosis Infection on <i>Monopterus albus</i> (Sybranchiformes: Sybranchidae) from Traditional Market in Banyuwangi, Indonesia</b>	...	62
Dana Icha Bakti, Gunanti Mahasri, Muhammad Amin Alamsjah, Annur Ahadi Abdillah and Mohammad Faizal Ulkhaq		
 <b>CLINICAL AND FIELD ARTICLES :</b>		
<b>Management of Penile Prolapse in Indian Tent Turtle (<i>Pangshura tentoriacircumdata</i>, Gray, 1834)</b>	...	65
Animesh Talukdar, Gowri Mallapur, Syed Ainul Hussain and Parag Nigam		
<b>Treatment of Generalised Demodicosis in a Dog Using a Single Oral Dose of Afoxolaner</b>	...	66
P. Chansiripornchai and N. Chansiripornchai		
<b>Intralipids for the Management of Ivermectin Toxicity in a Dog</b>	...	68
M.Shiju Simon, A Methai, N. Pazhanivel and K. Krishnakumar		
<b>Surgical Intervention for Perineal Cystocoele in a Cow</b>	...	70
R.Thangadurai and M.Vijayakumar		
<b>Cutaneous Haemangiosarcoma in a Pigeon and its Surgical Treatment</b>	...	72
R. Uma Rani and N. Pazhanivel		
<b>Successful Management of Multiple Infections in a Doe</b>	...	74
P.Abinaya, D.Selvi, A.Abiramy, P.Vijayalakshmi, K.Rajkumar, N.Devadevi and S.Sivaprakash		
<b>Clinical Laboratory Study of Dairy Cattle Infected by Blood Parasites</b>	...	75
Wijaya Agus, Muchammad Yunus and Maylina Leni		
<b>Author and Subject Index</b>		<b>78 &amp; 79</b>

## Antibiotic Resistance to *Staphylococcus aureus* and Methicillin Resistant *Staphylococcus aureus* (MRSA) Isolated from Dairy Farms in Surabaya, Indonesia

Wiwiek Tyasningsih, Mustofa Helmi Effendi<sup>1</sup>, Budiarto Budiarto and Indra Raja Syahputra

Department of Veterinary Public Health, Faculty of Veterinary Medicine, Airlangga University, Indonesia 60115.

(Received : May, 2019 177/19 Accepted : June, 2019)

### Abstract

Raw milk samples (80) were obtained from four dairy farms. Bacterial identification was based on the growth in Mannitol Salt Agar, Gram staining, catalase, and coagulase tests. 14 (17.5%) out of 80 milk samples were positive for *Staphylococcus aureus*. Antibiotic sensitivity test using Cefoxitin, Penicillin, Amphotericin, Oxacillin and Tetracycline showed resistance 14(100%), 14(100%), 12(85,7%), 9(64,3%) and 0(0%) to the antibiotics in that order, 9 isolates were positive for MRSA. It was concluded that the raw milk can be a potential reservoir for MRSA strains which is a threat to public health.

**Key words:** *Staphylococcus aureus*, Antibiotic Sensitivity, Milk, Indonesia

Milk is a good medium for the growth and development of *S. aureus*. Contamination can occur, during milking or processing. The main reservoir of *S. aureus* is in infected quarters (Akineden *et al.*, 2001) which causes (Salasia *et al.*, 2004) subclinical or chronic mastitis in dairy cows leading to considerable losses to the dairy industry (Katsuda *et al.*, 2005).

*S. aureus* infection in humans, especially Methicillin Resistant *S. aureus* (MRSA) is difficult to treat since they are known to be resistant to various antibiotics (Hata *et al.*, 2010). Staphylococcal infections occur due to postoperative injuries, infection during hemodialysis, (Fournier *et al.*, 2008).

In Surabaya, Methicillin Resistant *S. aureus* (MRSA) was isolated from raw milk from four dairy farms. Based on its antibiotic sensitivity test it was decided to assess the distribution of MRSA strains.

### Materials and Methods

Twenty milk samples were taken, each from Kaliwaron, Wonocolo, Pogot and Bendul Merisi Farms during the morning milking time.

10 ml of milk samples in test tubes collected from different farms were used for isolation of *S. aureus* by streaking on the MSA isolation media were incubated 37°C for 24 hrs. The appearances of Yellow coloured colonies were subjected to Gram staining (Effendi *et al.* 2018).

The presence of MSA was assessed by Catalase test by addition of 3% hydrogen peroxide on the yellow coloured colonies. The appearance of gas bubbles revealed the presence of *S. aureus* (Fig 1). The catalase test was performed by inoculating the yellowish colonies in nutrient broth, incubated at 37°C for 24 hrs followed by addition of 1 ml rabbit plasma and evenly mixed and incubated for 24 hrs. The clotting of plasma confirms the presence of *S. aureus* (Effendi *et al.* 2019).

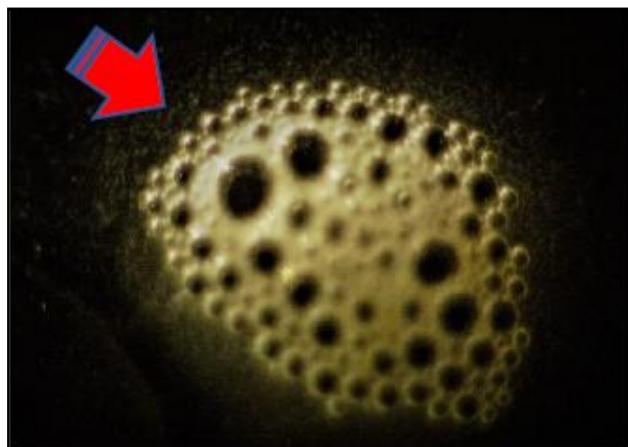
The antibiotic sensitivity test for *S. aureus* was carried out as per Kirby-Bauer method using Cefoxitin, Penicillin, Amphotericin, Oxacillin and Tetracycline (Fig 2) (CLSI, 2017).

### Results and Discussion

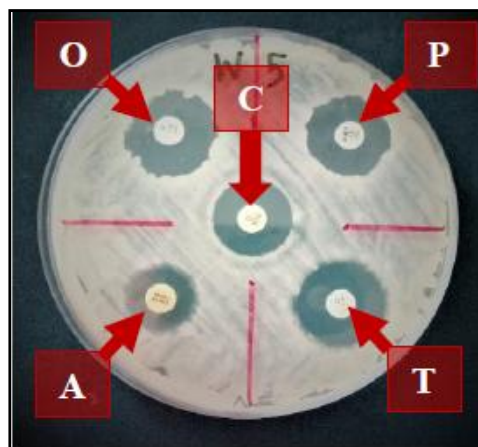
The results of isolation and identification on 80 samples of raw milk from 4 dairy farms in Surabaya revealed at 14 (17.5%) positive samples of *Staphylococcus aureus* (Table I).

Fourteen positive samples for *Staphylococcus aureus* were subjected to antibiotic sensitivity test using five antibiotics and the results are presented in Table II.

<sup>1</sup>Corresponding author : Email : mheffendi@yahoo.com



**Fig 1.** Catalase test on *Staphylococcus aureus* shows positive bubbles



**Fig 2.** Inhibition zone on antibiotic sensitivity test of isolate code W2. Information : C = Cefoxitin 30 µg; P = Penicillin 10 µg; A = Amphicillin 10 µg; O = Oxacillin 10 µg; T = Tetracyclin 30 µg

**Table I.** Presence of *Staphylococcus aureus* from milk samples in Surabaya, Indonesia.

Location of farm	Sample size	(+) MSA media	(+) Gram staining	(+) Catalase	(+) Coagulase
Kaliwaron (K)	20	5	5	5	2
Pogot (P)	20	5	5	5	4
Wonocolo (W)	20	6	6	4	2
Bendul Merisi (B)	20	7	7	6	6
<b>Total</b>	<b>80</b>	<b>23</b>	<b>23</b>	<b>20</b>	<b>14 (17.5%)</b>

The prevalence of *S. aureus* in 14 samples (17.5%) indicate necessity for clean milk production practices to reduce the contamination of *S. aureus*. The prevalence of *S. aureus* in this study is comparable with that of Ayano *et al.*, (2013) who reported a prevalence of 13.8%. The lower prevalence of 6.6% and 10.8% was reported in India (Kumar and Prasad, 2010) and Brazil (Fagundes *et al.*, 2010), respectively.

While a higher prevalence of 40%, and 100% respectively has been reported in Morocco (Bendahou *et al.*, 2008), and South Africa (Ateba *et al.*, 2010). The prevalence observed may be due to the presence of subclinical infection and negligence of hygienic practices such as improper milking procedures, milk handling techniques, and improper storage which increases *S. aureus* in milk.

The level of bacterial resistance to antibiotics according to the assessment standards of antibiotic inhibitory zone based on Clinical

Laboratory Standards Institute (CLSI) are grouped into three categories, namely sensitive, intermediate, and resistant (CLSI, *loc. cit.*)

Penicillin, Amphicillin, Cefoxitin and Oxacillin are antibiotics belonging to the class of  $\beta$ -lactam antibiotics.  $\beta$ -lactam antibiotics are antibiotics that are often used in the treatment of mastitis cases in dairy cows. The beta-lactam group has the ability to inhibit bacterial growth by influencing bacterial cell wall synthesis. This antibiotic has activity in *S. aureus* through the interaction of three heavy molecules and one mild molecule in penicillin binding proteins. The mechanism of action of antibiotics  $\beta$ -lactam begins with penicillin binding protein (PBPs) in bacteria (Quinn *et al.*, 2002). The function of penicillin binding protein is to have an effect on the synthesis of peptidoglycan cell walls and cell growth.  $\beta$ -lactam antibiotics bind and inhibit penicillin binding protein (PBPs), which is an enzyme for the synthesis of Peptidoglycan

**Table II.** Measurement of inhibition zone on antibiotic sensitivity test of *Staphylococcus aureus*.

No	Isolates Code	Diameter of inhibition zone of antibiotics in mm				
		Cefoxitin	Penicillin	Amphicillin	Tetracyclin	Oxacillin
		30 µg	10 µg	10 µg	30 µg	10 µg
1.	B1	15 (R)	26 (R)	27 (R)	22 (S)	21 (R)
2.	B2	16 (R)	26 (R)	20 (R)	22 (S)	15 (R)
3.	B3	20 (R)	24 (R)	19 (R)	23 (S)	16 (R)
4.	B4	20 (R)	22 (R)	19 (R)	15 (I)	22 (S)
5.	B5	18 (R)	20 (R)	19 (R)	20 (S)	27 (S)
6.	B6	20 (R)	25 (R)	29 (S)	17 (I)	15 (R)
7.	K1	18 (R)	19 (R)	15 (R)	18 (I)	27 (S)
8.	K2	20 (R)	26 (R)	22 (R)	23 (S)	25 (S)
9.	P1	21 (R)	20 (R)	18 (R)	17 (I)	24 (S)
10.	P2	20 (R)	17 (R)	14 (R)	23 (S)	19 (R)
11.	P3	20 (R)	24 (R)	21 (R)	23 (S)	21 (R)
12.	P3	17 (R)	25 (R)	29 (S)	17 (I)	14 (R)
13.	W1	18 (R)	22 (R)	18 (R)	23 (S)	11 (R)
14.	W2	19 (R)	20 (R)	18 (R)	16 (I)	21 (R)

Information: R: Resistant I: Intermediate S: Sensitive

(Effendi, 2009). The resistance to  $\beta$ -lactam can be caused by *S. aureus* being able to produce  $\beta$ -lactamase which can break up the  $\beta$ -lactam ring or the expression of PBP 2a which has a low affinity for oxacillin and other  $\beta$ -lactams.

Sensitivity on Cefoxitin antibiotics was observed in fourteen isolates which were 100% resistant to Cefoxitin. Cefoxitin is used as a test antibiotic to detect the resistance properties of antibiotic substances Cefoxitin and methicillin to *S. aureus* (Datta *et al.*, 2011). Isolates which showed resistance to Cefoxitin and Penicillin was also used in this study as a marker of *Staphylococcus aureus* in milk. The isolates from several dairy farms in the Surabaya were resistant to beta-lactam antibiotics.

The resistance of *Staphylococcus aureus* to  $\beta$ -lactam antibiotics is a problem that is quite common in several places, which is becoming more prevalent if treatment with  $\beta$ -lactam antibiotics is not based on dosage and appropriate use (Effendi, *loc. cit.*). The development of bacterial resistance to antibiotics is influenced by the intensity of antibiotic exposure in an area, and uncontrolled use of antibiotics tends

to increase the resistance of germs that were originally sensitive (Shryock and Richwine, 2010).

Based on the study that tetracyclin antibiotics can still be used in cases of infection by *Staphylococcus aureus* because they still have sensitivity to several *S. aureus* isolates. Tetracyclin has a broad spectrum activity against gram-positive and gram-negative bacteria by inhibiting protein synthesis (Velhner and Milanov, 2015).

Resistance to antibiotics caused by bacteria can be divided into three, among others, innate resistance (primary), acquired resistance (secondary), and episomal resistance. Innate (primary) resistance due to the presence of antibiotic decomposing enzymes in bacteria so that naturally these bacteria can break down antibiotics, resistance can be obtained (secondary) due to mutations in bacteria that occur quickly and can also occur for a long time and episomal resistance where bacteria have a factor R on plasmids that can be transmitted to other bacteria that have species links through conjugate or transduction cell contact (Jagielski

*et al.*, 2014). The study showed that Cefoxitin and penicillin were ineffective for the treatment of *S. aureus* infection. While for Oxacillin also showed that 5 samples that were still sensitive in samples code B4, B5, K1, K2 and P1. Samples code B6 and P4 were samples still sensitive against ampicillin. Samples that are still sensitive to  $\beta$ -lactam show that  $\beta$ -lactamase is still capable of hydrolyzing the  $\beta$ -lactam ring (Elsayed *et al.*, 2015). Tetracyclin can effectively be used in the treatment of *S. aureus* infections. In this study, there were 6 intermediate isolates against tetracyclin which were thought to be resistant. However, there were still 8 sensitive isolates.

We found that cefoxitin discs, as recommended by Jain *et al.*, 2008, is a good method for detecting MRSA by combining oxacillin discs so as to confirm MRSA presence. It is always recommended to combine the two methods, one with high sensitivity and the other with high specificity. According to the present results, 9 (64.28%) included MRSA. It is concluded that the disc diffusion (DD) test on oxacillin is more specific but less sensitive than the cefoxitin DD test. This finding is important to confirm the existence of MRSA and advice the government to take steps to control MRSA sourced from raw milk.

### Summary

MRSA is a bacterium that is resistant to antibiotic treatment. The presence of MRSA in raw milk in Surabaya requires proper combination of antibiotics based on antibiotic sensitivity test and the government intervention on the treatment schedule with required antibiotics.

### Acknowledgement

This study was supported in part with the PENELITIAN UNGGULAN FAKULTAS Funds from Airlangga University, Indonesia.

### References

Ateba, C.N., Mbewe, M., Moneoang, M.S., and Bezuidenhout C.C. (2010) Antibiotic resistance *Staphylococcus aureus* isolated from milk in Mafikeng Area, North West province, South Africa. *S Afr J Sci*, 106 (11-12): 243-248.

Ayano, A.A., Hiriko, F., Simyalew, A.M., and Yohannes A. (2013) Prevalence of subclinical mastitis in lactating cows in

selected commercial dairy farms of Holeta district. *J Vet Med Anim Health*, 3: 67-72.

Bendahou, A., Lebbadi, M., Ennane, L., Essadqui, F.Z., and Abid M. (2008) Characterization of *Staphylococcus* species isolated from raw milk and milk products (Iben and jben) in North Morocco. *J Infect Dev Ctries*, 2:218-225.

CLSI. (2017) M100 Performance Standards for Antimicrobial. 27th ed. Clinical and Laboratory Standards Institute, USA.

Datta, P., Gulati, N., Nidhi Singla, N., Vasdeva, H.R., Bala, K., Chander, J., and Gupta, V. (2011) Evaluation of various methods for the detection of methicillin-resistant *Staphylococcus aureus* strains and susceptibility patterns. *J. of Med. Microbiol.*, 60: 1613-1616.

Effendi, M.H. (2009) Peta Resistensi Antibiotika *Staphylococcus aureus* dari kasus Mastitis Sapi Perah di Beberapa Daerah Peternakan. *Media Kedokteran Hewan*. 24 (3) : 159-164.

Effendi, M.H., Hisyam, M.A.M., Hastutiek, P., and Tyasning-sih, W. (2019) Detection of coagulase gene in *Staphylococcus aureus* from several dairy farms in East Java, Indonesia, by polymerase chain reaction, *Vet. World*, 12(1): 68-71.

Effendi, M.H., Oktavianto, A and Hastutiek, P. (2018) Tetracycline Resistance Gene In *Streptococcus Agalactiae* Isolated From Bovine Subclinical Mastitis In Surabaya, Indonesia. *Philipp. J. Vet. Med.*, 55(SI): 115-120.

Elsayed, M.S., El-Bagoury, A.M. and Dawoud, M.A. (2015) Phenotypic and genotypic detection of virulence factors of *Staphylococcus aureus* isolated from clinical and subclinical mastitis in cattle and water buffaloes from different farms of Sadat city in Egypt. *Vet. World*, 8(9): 1051-1058.

Fagundes, H, Barchesi, L., Filho, A.N., Ferreira, L.M., and Oliveira, C.A. (2010) Occurrence of *Staphylococcus aureus* in raw milk produced in dairy farms in São Paulo state, *Braz J Microbiol*, 2:376-380.

Fournier, C., Kuhnert, P., Frey, J., Miserez, R., Kirchhofer, M., Kaufmann, T., Steiner, A. and Graber, H.U. (2008) Bovine *Staphylococcus aureus*: Association of virulence genes, genotypes, and clinical outcome. *Res. Vet. Sci.*, 85(3): 439-448.

Hata, E., Katsuda, K., Kobayashi, H., Uchida, I., Tanaka, K. and Eguchi, M. (2010) Genetic variation among *Staphylococcus aureus* strains from bovine milk and their relevance to methicillin-resistant isolates from humans. *J. Clin. Microbiol.*, 48(6): 2130-2139.

Jagielski, T., Puacz, E., Lisowski, A., Siedlecki, P., Dudziak, W., Mi dzobrodzki, J. and Krukowski, H. (2014) Short communication: Antimicrobial susceptibility profiling and genotyping *Staphylococcus aureus* isolates from bovine mastitis in Poland. *J. Dairy Sci.*, 97(10): 6122-6128.

Katsuda, K., Hata, E., Kobayashi, H., Kohmoto, M., Kawashima, K., Tsunemitsu, H. and Eguchi, M. (2005) Molecular typing of *Staphylococcus aureus* isolated from bovine mastitic milk on the basis of toxin genes and coagulase gene polymorphisms. *Vet. Microbiol.*, 105(3-4): 301-305.

Kumar, R., and Prasad, A. (2010) Detection of *E. coli* and



*Staphylococcus* in milk and milk products in and around Pantnagar. *Vet World*, **3**(11): 495-496.

Quinn, P.J., Markey, B.K. Carter, M.E., Donley, W.J. and Leonard, F.C. (2002) *Veterinary Microbiology and Microbial Disease*. Blackwell Publishing. Great Britain. Pp 43-46

Salasia, S.I.O., Khusnan, Z., Lämmler, C. and Zschöck, M. (2004) Comparative studies on pheno-and genotypic properties of *Staphylococcus aureus* isolated from bovine subclinical mastitis in central Java in Indonesia and Hesse in Germany. *J. Vet. Sci.*, **5**(2): 103-109

Salasia, S.I.O., Tato, S., Sugiyono, N., Ariyanti, D. and Pra-

bawati, F. (2011) Genotypic characterization of *Staphylococcus aureus* isolated from bovines, humans, and food in Indonesia. *J. Vet. Sci.*, **12**(4): 353-361.

Shryock, T.R., and Richwine, A. (2010) The interface between veterinary and human antibiotic use. *Ann N Y Acad Sci*, **1213**: 92-105.

Velhner, M. and Milanov, D. (2015) Resistance to tetracycline in *Escherichia coli* and *Staphylococcus aureus*: brief overview on mechanisms of resistance and epidemiology. *Archives of Vet.Med.*, **8**(1): 27-36.

Indian Vet. J., November 2019, 96 (11) : 31 - 33

## Detection of *Salmonella* on Chicken Meat Using Immunomagnetic Separation and Conventional Methods from Traditional Market in Surabaya, East Java, Indonesia

Dhandy Koesoemo Wardhana<sup>1</sup>, Muhammad Thohawi Elziyad Purnama, Ooi Hong Kean and Wiwiek Tyasningsih

Department of Veterinary Public Health, Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya, Indonesia, 60115.

(Received : April, 2019 151/19 Accepted : July, 2019)

### Abstract

The purpose of this study was to compare the detection of *Salmonella* in chicken meat from traditional market Surabaya using immunomagnetic separation and conventional methods. Total of 12 samples each from chicken meat were isolated from five traditional market in Surabaya. There are Keputran, Wonokromo, Gubeng, Wiyung and Pabean. Each sample was tested by immunomagnetic separation and conventional methods. The results showed that the immunomagnetic separation methods positive for *Salmonella* (35%), higher than the conventional methods (18,3%).

**Key words:** Chicken meat, *Salmonella*, conventional methods, immunomagnetic separation

*Salmonella* is still among the most frequently reported zoonotic agents causing food-borne infections worldwide (Parry and

Threlafall, 2008). Poultry are one of the most important reservoirs of *Salmonellae* that can be transmitted to humans through the food-chain (Anumolu and Lakkikeni, 2014, Saravanan *et al.*, 2015). Chicken which is permitted for consumed must be free of *Salmonella* (Gorman *et al.*, 2002). The purpose of this study was to compare the detection of *Salmonella* in chicken meats from traditional market Surabaya, using conventional and immunomagnetic separation methods.

### Materials and Methods

Total of 60 samples of chicken meat were taken at 5 traditional market in Surabaya, which are Keputran, Wonokromo, Gubeng, Wiyung, and Pabean. The carcass samples obtained were 12 samples for each traditional market. 25 mg chicken meat samples isolated by immunomagnetic separation and conventional methods. Immunomagnetic separation methods used Dynabeads<sup>®</sup> anti-Salmonella (Thermo Fisher

<sup>1</sup>Corresponding author : Email: dhandy.koesoemo.wardhana@fkh.unair.ac.id