PREFACE

The focus of the veterinary and life science researcher has shifted substantially since the realizing that the research in animal and life science has a big part of human prosperity life. Following general social trends and specific structural changes in agricultural production, zoonosis disease, several technology application on animal have risen. More and more the question has arises as to the whether curative medical treatment of individual animals makes economic sense. Increasingly veterinarians and other reasearcher in animal and life science are expected to provide preventive management, not only in regard to animal health, but also to ensure the production of high quality food and the appropiatness of the management system of animal and life things.

This publication reports papers presented at the International Seminar of The advanced Technology of Veterinary and Life Science, organized by and held at the Faculty of Veterinary Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia on March 12, 2011. Three sessions of 66 papers were held at the conference: plenary session featuring keynote speakers and invited papers, oral presentation papers and poster presentation session. This proceeding features 60 theme of three filed reasearchs, basic, preclinical and clinical sciences.

We particullary I acknowledge with sincere gratitude the invaluables contribution the authors who submitted the manuscripts and the member of scientific committee, who suggested the topics and authors to be included and edited the manuscripts. I wish to thank my fellow Organizing Committee to their
2. Pare Extract (Momordica charantia L) as an Antioxidant Potency For Reducing Blood Glucose Level on Pre-Diabetic Rat (Spague dawley) Model Stability of Sardine Fish Oil and Hydrolyzed Blood Protected to Increase Productivity Erni Sulistia-wati, R.P. Agus Lelana, and Tri Wahyu Pangestiningsih

3. Acute Toxicity Of Cashew Nuts Shell Extract (Anacardium occidentale L) in Albin Rat: A Preliminary Study Harlita, Nur Handayani, NS., Sagi, M., Astuti, P.

Topic 3 : Basic Science
Sub Topic: Applied Science

1. Mesenchimal stem cell: Potensial Drug For Regeneratif Medicine Yudha Heru Fibrianto

2. Concentration of Estradiol in Nilem (Osteocilus hasselti C.V.) under Photoperiods Manipulation Prayogo, N.A., G.E. Wijayanti, Murwantoko san P.Astuti


Topic 4 : Basic Science
Sub Topic: Basic Anatomy

1. Comparison Distribution of Various Lectins on The Stomach of the Java Fruit Bat (Rosettus sp.) and The Java Insect Bat (Myosit sp.) Ariana and Teguh Budipitojo

2. Immunohistochemical Study of The Ghrelin In The Stomach of Java Porcupine (Hystrix Javanica) Teguh Budipitojo, Motoki Sasaki, Ariana, Soehartini Jatman, and Nobuo Kitamura

3. Lectin histochemistry for Sialic Acid Receptor Detection in Rat Olfactory Property Indicate An Alternative Transmission Route of Avian Influenza Virus Woro D. Wendo, Dwi Liliek Kusindarta, M. Untoro, and Ditya Bayu Pangesta

4. Morphometrical Data of The Canines Dens in Male and Female Longtailed Macaque as the Guidance for The Manipulation and Treatments Hery Wijayanto, Tri Wahyu Pangestiningsih, Dwi Liliek Kusindarta, l Nengah Budiarsa and Aflian Galuh

Topic 5 : Preclinical Science
Sub Topic: Microbiology

1. The Effectiveness of Disinfectan Treatment to Reduce Egg’s Bacterial Count Widagdo Sri Nugroho, Khrisdiana Putri, Damar Dwi Haryanto dan Marsudi

2. Surface Character of Coagulase Negative Staphylococcus From Dairy Milk: Surface Protein, Hydrophobicity And Hemaglutination Agnesia Endang Tri Hastuti Wahyuni


4. Role of An Adhesin of Chlamydia pneumonia on the Inhibition Of Infected Cells Sri Murwani

5. Isolation and Identification of Dermatophytes From Cats In Yogyakarta Yanuartono, Soedarmanto I., Surya Amanu, G. Sakan, and A. Anita
THE EFFECTIVENESS OF DISINFECTION TREATMENTS TO REDUCE TOTAL EGG’S BACTERIA

Widagdo Sri Nugroho,1* Khrisdiana Putri,1 Damar Dwi Haryanto2, Marsudi2

1. Department of Veterinary Public Health, Faculty of Veterinary Medicine Universitas Gadjah Mada, Jl. Fauna No. 2 Karangmalang, Yogyakarta 55281 Indonesia.
2. Undergraduate Student of Faculty of Veterinary Medicine Universitas Gadjah Mada, Jl. Fauna No. 2 Karangmalang, Yogyakarta 55281 Indonesia.

Abstract

When the egg was laid in the nest, the environment contaminated the shell and influenced to the egg hygiene and threatens the consumer safety. Egg consumers in household need more information to keep the eggs correctly and safely for their health base on the scientific research. The aim of this study was to investigate the impact of disinfection against total egg’s bacteria when the eggs were stored in room temperature. The eggs were distributed into one control group (without cleaning treatment) and four disinfectant treatment groups i.e. gas fumigation 2x strength, potassium permanganate solution 0.5%, acetic acid 1.25%, detergent solution 0.5%) and every group consist 33 eggs. After disinfection, all groups were stored in room temperature (±26°C) then total bacterial were counted at 2 hours, 2 days, 4 days, 6 days, 8 days, 10 days, 12 days, 14 days, 16 days, 18 days, and 20 days after stored. Egg-shell swab and egg’s liquid (mixed of albumin and yolk) from three eggs of each group were taken in every observation period. All samples were serial diluted in sterile ringer solution (Oxoid) and plating with Plate Count Agar (Oxoid) then incubated at 37°C for 24 hours. Data was analyzed using General Linear Model Multivariate and post-hoc test using LSD (SPSS ver. 17). Gas fumigation, acetic acid 1.25%, and detergent solution 0.5% treatments inhibited bacteria growth less than \(10^5\) CFU/ml (SNI 01-3926-2008) in shell egg for 4 days storage, while potassium permanganate 0.5% and detergent solution 0.5% effectively inhibited bacteria growth less than \(10^5\) CFU/ml (SNI 01-3926-2008) in egg-liquid until 4 days storage too. After 4 days storage, all treatment and control groups showed the bacterial amount more than \(10^5\) CFU/ml both in egg shell and liquid. Potassium permanganate solution 0.5% and detergent solution 0.5% effectively inhibited bacteria growth less than \(10^5\) CFU/ml (SNI 01-3926-2008) in eggs until 4 days.

Key words: egg, disinfectant, room temperature

Acknowledgment

Our grateful is address to PT. Wanara Satwa Loka for their kindness to providing the crania specimens, and Laboratory of Anatomy of Veterinary Medicine, Gadjah Mada University for providing the research facilities.

References

Crook. 1972. Sexual selection, dimorphism, and social organization in the primates, Sexual selection and the descent of man


Introduction

When the eggs were laid in the nest, the environment could contaminate the egg shell and it influenced to egg hygiene and for consumers safety. Egg consumers in household level need more information to keep the eggs correctly and safely for their health base on the scientific research. The aim of this study was to investigate the impact of disinfection against total egg's bacteria when the eggs were stored in room temperature.

Material and method

The eggs were distributed into one control group (without cleaning treatment) and four disinfectant treatment groups i.e. gas fumigation 2x strength, potassium permanganate (KMNO₄) solution 0.5%, acetic acid 1.25%, detergent solution 0.5%) and every group consist 33 eggs. After disinfected, all groups were stored in room temperature (±26°C) then total bacterial were counted at 2 hours, 2 days, 4 days, 6 days, 8 days, 10 days, 12 days, 14 days, 16 days, 18 days, and 20 days after stored. Swab of egg-shell and egg’s liquid (albumin and yolk were mixed) from three eggs of each treatment unit were taken in every observation period. All samples were serial diluted in sterile ringer solution (Oxoid) and plating with Plate Count Agar (Oxoid) then incubated at 37°C for 24 hours. Data was analyzed by general linear model multivariate and post-hoc test using LSD (SPSS ver. 17).

Results

There were significant differences on total bacterial counted between disinfection treatment and control groups at 2 hours, day 2nd until 12th, and 18th after treatment and storage. All groups treatments and control showed the average of bacteria growth less than 10⁵ CFU/ml (SNI 01-3926-2008) only the first 4 days storage. The average amount of bacterial at egg shell in gas fumigation treatment was 8.7 X 10⁴ CFU/ml, KMNO₄ solution 0.5% was 1.6 X 10⁵ CFU/ml, acetic acid 1.25% was 2.3 X 10⁴ CFU/ml, detergent solution 0.5% was 3.7 X 10⁴ CFU/ml; and a control group was 1.5 X 10⁵ CFU/ml. While the average of bacterial amount of egg content in gas fumigation treatment was 1.0 X 10⁴ CFU/ml, KMNO₄ solution 0.5% was 4.1 X 10⁴ CFU/ml, acetic acid 1.25% was 2.2 X 10⁴ CFU/ml, detergent solution 0.5% was 7.2 X 10⁴ CFU/ml; and a control group was 2.3 X 10⁴ CFU/ml. The average of total bacteria from all groups at the egg shell (7.2 X10⁴ CFU/ml) lower than egg content (1.1 X 10⁵ CFU/ml) until 4th day. The similarity result showed if the eggs stored in refrigerator temperature (±4°C), but the average of total bacteria of egg’s content 5.3 X 10⁴ CFU/ml lower than it stored in room temperature (Nugroho et al., 2010). After 4 days storage, bacteria growth fast and reached more than 10⁵ CFU/ml and increased up to 10⁷ CFU/ml in 16 days storage and then decreased until 20 days storage but still higher than SNI.

The presence of bacteria in egg could be found in egg shell or in liquid (albumin and yolk). The bacteria came from the hens and from the environment. The egg liquid could be contaminated bacteria vertically from illness hens or from contaminated bacteria which penetrate the egg pores. Dawson et al. (2001) reported that conventional litter floor environments typically contaminated egg more than cage system. Eggs from deep litter floor production system were contaminated bacteria 15 times greater than those from battery production. Bacterial counts on shell surfaces from the eggs of broiler breeder hens housed in partial slat pens revealed that the eggs laid in litter material (1.75 x 10⁹ CFU/mL).
were significantly dirtier than eggs laid in the nest (6.96 x 10^4 CFU/ml) or on the slats (3.87 x 10^5 CFU/ml) (Sander et al. 2003).

In the adequate heat and moisture, within 15 minutes after egg is laid, this number will have increased to between 1.5 x 10^5 CFU and 3.0 x 10^6 CFU in another hour. 2. x 10^6 CFU and 3.0 x 10^6 CFU will be present. Suction and shell penetration bacteria are greatest immediately after oviposition of all eggs laid by flock 15% will have bacteria shell penetration in 15 minutes, 21% in 30 minutes, 25 in 60 minutes, but only 33% in 24 hours (North and Bell, 1990). The ability of spoilage bacteria to penetrate the egg shell pores could happen in 5 minutes (Sauter and Peterseon cited ICMSF, 2005).

Those statements supported the results in this study which in 2 hours after stored in room temperature, the total bacteria contamination in egg shell from all groups were more than 10^3 CFU/ml. North and Bell (1990) explained that shell quality is more important to shell penetration rather than time, in poor quality 34% bacteria in shell will penetrate into the inside of egg in 30 minutes. Effect of bacteria in the egg liquid showed by the number of bacteria higher than egg shell. Understandable, because albumen and yolk (egg’s liquid) are the best media for bacteria growth.

### Table 1 Average of total bacteria in eggs after disinfection treatment and stored in room temperature (log/ml)

<table>
<thead>
<tr>
<th>Fumigation</th>
<th>KMNO4</th>
<th>Acetic acid</th>
<th>Detergent</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>shell</td>
<td>content</td>
<td>shell</td>
<td>content</td>
<td>shell</td>
</tr>
<tr>
<td>3.07^a</td>
<td>3.93</td>
<td>3.7</td>
<td>3.81</td>
<td>4.36^a</td>
</tr>
<tr>
<td>2.46</td>
<td>4.05^ab</td>
<td>3.87^ab</td>
<td>3.55^d</td>
<td>3.85^e</td>
</tr>
<tr>
<td>4.94</td>
<td>5.02^a</td>
<td>5.22^ab</td>
<td>4.61^ahi</td>
<td>4.37^shl</td>
</tr>
<tr>
<td>9.01^w</td>
<td>9.05^w</td>
<td>9.85^w</td>
<td>8.89^wil</td>
<td>9.66^1</td>
</tr>
<tr>
<td>13.34^o</td>
<td>13.27^a</td>
<td>13.60</td>
<td>13.80^w</td>
<td>13.13^k</td>
</tr>
<tr>
<td>16.03^op</td>
<td>17.02^op</td>
<td>16.18^sew</td>
<td>16.66^w</td>
<td>16.33^mek</td>
</tr>
<tr>
<td>15.66</td>
<td>15.26^w</td>
<td>15.73</td>
<td>15.87^w</td>
<td>15.57</td>
</tr>
<tr>
<td>9.91</td>
<td>15.79</td>
<td>9.53</td>
<td>15.57</td>
<td>15.09</td>
</tr>
<tr>
<td>7.22</td>
<td>7.68</td>
<td>3.57</td>
<td>11.43</td>
<td>7.45</td>
</tr>
<tr>
<td>11.11</td>
<td>11.37</td>
<td>11.16</td>
<td>11.54^w</td>
<td>10.81^we</td>
</tr>
<tr>
<td>11.62</td>
<td>7.48</td>
<td>11.63</td>
<td>7.76</td>
<td>11.36</td>
</tr>
</tbody>
</table>

The superscript alphabet in the same raw showed the significant deference between groups (P<0.05)
According those data, potassium permanganate 0.5% and detergent solution 0.5% effectively inhibited bacteria growth less than $10^5$ CFU/ml (SNI 01-3926-2008) in eggs until 4 days.

Acknowledgement

Thanks for Faculty of Veterinary Medicine Universitas Gadjah Mada which founded this study by Hibah Fakultas Kedokteran Hewan UGM, contract no. 2550/A.011.122/KP/2009, 26 June 2009.

References


