

THE EFFECTIVENESS OF BACTERIOPHAGE IN REDUCING THE NUMBER OF MICROORGANISMS IN CHICKEN MEAT

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**STUDY PROGRAM OF VETERINARY SCIENCES
SCHOOL OF VETERINARY MEDICINE AND
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BOGOR
2026**



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ABSTRACT

DINISHAA PASAMURLI. THE EFFECTIVENESS OF BACTERIOPHAGE IN REDUCING THE NUMBER OF MICROORGANISMS IN CHICKEN MEAT. Supervised by ETIH SUDARNIKA and HAVAN YUSUF.

Microbial contamination in chicken meat is a major food safety concern. One potential method for controlling microbial growth is the use of bacteriophages as biological agents. This study aimed to determine the effectiveness of different bacteriophage concentrations and storage durations in reducing microbial counts in chicken meat. Six treatment groups were evaluated, consisting of a positive control, negative control, and bacteriophage treatments at concentrations of 1:1 (spraying), 1:10, 1:100, and 1:1000 (dipping). Samples were stored under refrigerated conditions for 0, 24, and 48 hours. Microbial counts were determined using the Total Plate Count (TPC) method and analyzed using the Kruskal–Wallis test. No significant differences were observed among treatment groups at 0 hours. Significant differences were detected after 24 hours, with the 1:10 dipping treatment showing the lowest microbial count and the greatest antibacterial effectiveness. In contrast, the 1:100 and 1:1000 treatments exhibited higher microbial counts, indicating lower bacteriophage efficacy at reduced concentrations. Although microbial counts increased at 48 hours, bacteriophage-treated samples remained lower than the positive control. These findings demonstrate that bacteriophages can effectively delay microbial growth in chicken meat, with the 1:10 dipping treatment providing the best reduction during the first 24 hours of refrigerated storage.

Keywords: Bacteriophage, chicken meat, food safety, microbial reduction, Total Plate Count (TPC)

ABSTRAK

DINISHAA PASAMURLI. Efektivitas Bakteriofag dalam Mengurangi Jumlah Mikroorganisme pada Daging Ayam. Dibimbing oleh ETIH SUDARNIKA dan HAVAN YUSUF.

Kontaminasi mikroba pada daging ayam merupakan salah satu masalah utama dalam keamanan pangan. Salah satu metode yang berpotensi untuk mengendalikan pertumbuhan mikroba adalah penggunaan bakteriofag sebagai agen biologis. Penelitian ini bertujuan untuk menentukan efektivitas berbagai konsentrasi bakteriofag dan lama penyimpanan dalam menurunkan jumlah mikroba pada daging ayam. Enam kelompok perlakuan digunakan, yaitu kontrol positif, kontrol negatif, serta perlakuan bakteriofag dengan konsentrasi 1:1 (*spraying*), 1:10, 1:100, dan 1:1000 (*dipping*). Sampel disimpan pada kondisi refrigerasi selama 0, 24, dan 48 jam. Jumlah mikroba ditentukan menggunakan metode *Total Plate Count* (TPC) dan dianalisis menggunakan uji Kruskal–Wallis. Hasil penelitian menunjukkan bahwa tidak terdapat perbedaan signifikan antar kelompok perlakuan pada 0 jam. Perbedaan signifikan mulai terlihat setelah 24 jam penyimpanan, dengan perlakuan



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perendaman bakteriofag konsentrasi 1:10 menghasilkan jumlah mikroba terendah dan efektivitas antibakteri tertinggi. Sebaliknya, perlakuan konsentrasi 1:100 dan 1:1000 menunjukkan jumlah mikroba yang lebih tinggi. Meskipun jumlah mikroba meningkat pada 48 jam, seluruh kelompok yang diberi bakteriofag tetap memiliki jumlah mikroba lebih rendah dibandingkan kontrol positif. Hasil penelitian menunjukkan bahwa bakteriofag berpotensi digunakan sebagai strategi pengendalian biologis untuk meningkatkan keamanan daging ayam, dengan perlakuan perendaman konsentrasi 1:10 memberikan hasil terbaik selama 24 jam pertama penyimpanan refrigerasi.

Kata kunci: Bakteriofag, daging ayam, jumlah mikroba, keamanan pangan, *Total Plate Count (TPC)*



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THE EFFECTIVENESS OF BACTERIOPHAGE IN REDUCING THE NUMBER OF MICROORGANISMS IN CHICKEN MEAT

DINISHAA PASAMURLI

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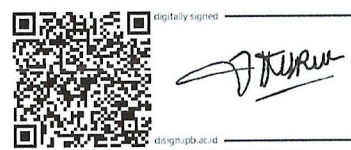


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The author recognizes that this thesis is not without its shortcomings, and welcomes any feedback or suggestions that might strengthen future work in this area. It is hoped that this study offers a meaningful, if modest, contribution to the field.

Bogor, July 2026

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