

KUALITAS FISIKO-KIMIA, MIKROBIOLOGIS, DAN AKTIVITAS ANTIBAKTERI PATOGEN SUSU SAPI TERFERMENTASI INOKULUM KOMBUCHA TEH HITAM DAN TEH HIJAU

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INTISARI

Penelitian ini bertujuan untuk mengetahui kualitas fisiko-kimia, mikrobiologis, dan aktivitas antibakteri susu sapi terfermentasi dengan inokulum kombucha teh hitam, inokulum kombucha teh hijau, serta kultur bakteri *Streptococcus thermophilus* dan *Lactobacillus bulgaricus* (STLB). Desain penelitian ini menggunakan analisis rancangan acak lengkap pola searah (*oneway ANOVA*) untuk hasil uji kualitas fisiko-kimia dan mikrobiologis. Jika terdapat perbedaan dilanjutkan dengan *Duncan's Multiple Range Test* (DMRT). Parameter yang diuji yaitu kualitas fisiko-kimia, mikrobiologis, serta aktivitas antibakteri susu sapi terfermentasi terhadap *Escherichia coli* dan *Staphylococcus aureus*. Pengujian aktivitas antibakteri dilakukan dengan metode difusi cakram. Uji kemampuan antibakteri yang dilakukan berupa uji aktivitas antibakteri (kontrol), uji aktivitas antibakteri setelah penambahan enzim proteolitik serta pengaturan pada kondisi sampel pH 11. Hasil analisis statistik menunjukkan bahwa penggunaan inokulum kombucha teh hitam dan teh hijau berbeda nyata ($p < 0,05$) dengan penggunaan inokulum STLB terhadap kualitas fisiko-kimia dan aktivitas antibakteri produk. Penggunaan inokulum kombucha teh hitam, teh hijau, dan STLB tidak menghasilkan perbedaan nyata ($p > 0,05$) pada kualitas mikrobiologis (total BAL, total BAA dan total yeast). Rerata diameter zona hambat yang dihasilkan produk susu fermentasi dengan inokulum kombucha teh hitam, teh hijau, dan STLB pada bakteri *E. coli* dan *S. aureus* adalah sebesar 2,40mm, 2,51mm, dan 1,08mm. Rerata diameter zona hambat yang dihasilkan produk susu fermentasi terhadap bakteri *E. coli* adalah sebesar 2,37mm lebih besar dibandingkan zona hambat pada *S. aureus* yang sebesar 1,63mm. Aktivitas antibakteri pada produk susu fermentasi disebabkan oleh bakteriosin.

Kata kunci: Susu sapi fermentasi, kombucha, teh hitam, teh hijau, aktivitas antibakteri.

PHYSICOCHEMICAL AND MICROBIOLOGICAL QUALITY, AND ANTIBACTERIAL ACTIVITY OF FERMENTED COW'S MILK USING BLACK TEA AND GREEN TEA KOMBUCHA INOCULUMS

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ABSTRACT

The aim of this study was to compare the physicochemical and microbiological quality, and antibacterial activity of milk fermented by using inoculum from black tea kombucha, green tea kombucha, also *Streptococcus thermophilus* and *Lactobacillus bulgaricus* (STLB) cultures. The design of experiment was using completely randomized design (CRD; one-way ANOVA) for physicochemical and microbiological qualities data. Data with significant differences was further analyzed using Duncan's Multiple Range Test (DMRT). The parameters measured were physicochemical and microbiological qualities, and antibacterial activity of the product. Antibacterial activity was tested using the disc diffusion method for *Escherichia coli* dan *Staphylococcus aureus* bacteria. Confirmation test of the antibacterial activity was done using proteolytic enzyme, and variation of pH on pH 11. The statistical analysis revealed that the use of different inoculum significantly influenced the physicochemical quality and antibacterial activity ($p < 0.05$) of the fermented milk product. The application of kombucha inoculums and STLB cultures of fermented milk product had no significant effect ($p > 0.05$) on microbiological quality (total LAB, total AAB, and total yeast). The inhibition zone diameter made from fermented milk by using black tea kombucha inoculum, green tea kombucha inoculum, and STLB cultures against *E. coli* and *S. aureus* bacteria were 2,40 mm, 2,51 mm, and 1,08 mm. The inhibition zone diameter against *E. coli* bacteria (2,37mm) were bigger from the inhibition zone diameter against *S. aureus* bacteria (1,63mm). Antibacterial activity of fermented milk product in this study caused by bacteriocin activity.

Key words: fermented cow's milk, kombucha, black tea, green tea, antibacterial activity