

INTISARI

Edible film kitosan (CHI)-whey protein isolate (WPI) dengan penambahan ekstrak antosianin kulit rambutan (AN) sebanyak 0; 0,1; 0,3; dan 0,5 gram telah dikembangkan pada penelitian ini yang bertindak sebagai agen antimikroba dan antioksidan untuk mempertahankan kualitas daging sapi. Karakterisasi dilakukan untuk mengevaluasi sifat fisik, kimia, dan fungsional edible film. Hasil penelitian menunjukkan bahwa AN berinteraksi dengan matriks CHI-WPI menghasilkan mikrostruktur film yang seragam. Film CHI-WPI dengan penambahan 0,5 gram AN menunjukkan nilai transparansi terendah, kadar air sebesar 19,75%, kelarutan sebesar 2,80%, serta permeabilitas uap air sebesar $5,47 \times 10^{-8} \text{ H}_2\text{O.g.mm/m}^2\text{.Pa.s}$. Selain itu, film tersebut memiliki *tensile strength* terbesar yaitu 3,11 MPa yang disebabkan oleh terbentuknya ikatan hidrogen kuat antara komponen penyusun film, serta menunjukkan *elongation at break* terendah, yaitu 74,73%. Edible film pada penelitian ini menunjukkan adanya aktivitas antioksidan dengan persen penghambatan radikal bebas 88,02% dan antimikroba yang menunjukkan zona hambat pada *S.aureus* (7.00 ± 1.41) dan *E.coli* (4.25 ± 0.35). Untuk mengevaluasi efektivitas film dalam memperpanjang masa simpan daging sapi, irisan daging sapi dibungkus dengan film dan disimpan pada suhu 4-5°C selama 10 hari. Hasil penelitian menunjukkan bahwa film CHI-WPI dengan 0,5 gram AN (CHI-WPI-AN3) paling efektif dalam menekan bilangan peroksida selama penyimpanan. Namun, perubahan warna dan tekstur daging mulai terlihat setelah penyimpanan hari keempat. Penelitian ini menunjukkan potensi penggunaan edible film CHI-WPI yang diperkaya dengan ekstrak antosianin kulit rambutan sebagai kemasan aktif untuk produk pangan.

Kata kunci: Ekstrak antosianin, Edible film, Kulit rambutan, Whey protein isolate

ABSTRACT

*Chitosan (CHI)-whey protein isolate (WPI) edible films incorporated with rambutan peel anthocyanin extract (AN) at concentrations of 0, 0.1, 0.3, and 0.5 grams were developed in this study. These films function as antimicrobial and antioxidant agents to preserve the quality of beef. These films were characterized by their physical, chemical, and functional properties. The result indicated that AN interacts effectively with the CHI-WPI matrix, resulting in a uniform film microstructure. Among the tested films, the CHI-WPI film with 0.5 g of AN exhibited the lowest levels of transparency, moisture content (19.75%), solubility (2.80%), and water vapor permeability ($5.47 \times 10^{-8} \text{ H}_2\text{O.g.mm/m}^2.\text{Pa.s}$). In contrast, this film also demonstrated the highest tensile strength (3.11 MPa), which is caused by the formation of strong hydrogen bonds between the constituent components of the film, and shows the lowest elongation at break (74.73%). Furthermore, it exhibited antioxidant activity with a free radical inhibition percentage of 88.02% and antimicrobial activity, as indicated by the inhibition zones against *S. aureus* ($7.00 \pm 1.41 \text{ mm}$) and *E. coli* ($4.25 \pm 0.35 \text{ mm}$). To assess the film's effectiveness in preserving beef slices, beef slices were wrapped with the films and stored at 4-5°C for 10 days. The findings revealed that the CHI-WPI film containing 0.5 g of AN (CHI-WPI-AN3) was most effective in suppressing peroxide values during storage. However, noticeable changes in the color and texture of the beef were observed after the fourth day of storage. These results highlight the potential of CHI-WPI films incorporated with rambutan peel anthocyanin extract as active packaging for food products.*

Keywords: *Anthocyanin extract, Edible Film, Chitosan, Whey protein isolate, Rambutan peel*