KARAKTERISTIK *EDIBLE FILM* BERBASIS GELATIN KULIT IKAN TENGGIRI (*Scomberomorus commerson*) DENGAN PENAMBAHAN EKSTRAK ETANOL DAUN TIN (*Ficus carica* L.) SERTA PENGARUHNYA PADA KUALITAS DAGING SAPI

INTISARI

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Meningkatnya penggunaan plastik berbasis minyak bumi yang dapat menimbulkan permasalahan lingkungan, telah mendorong upaya pengembangan bahan kemasan aktif (*active food packaging)* yang ramah lingkungan, salah satunya berupa *edible film*. Meskipun penggunaan *edible film* berbahan dasar gelatin ikan sebagai *active packaging* merupakan opsi yang menarik. Ekstrak daun tin (FLE) memiliki aksesibilitas yang tinggi dengan harga terjangkau. Selain itu, FLE dikenal dengan sifat antioksidannya yang mampu menangkap dan menghambat radikal bebas. Tujuan dari penelitian ini adalah untuk mengembangkan *edible film* berbasis kulit ikan dengan penambahan ekstrak daun tin (*Ficus carica* L.).

Pembuatan *edible film* pada penelitian ini dilakukan dengan menambahkan FLE pada gelatin kulit ikan tenggiri dengan variasi konsentrasi (2,5–10% b/b). Hasil penelitian menunjukkan bahwa penambahan FLE pada *edible film* berbasis gelatin kulit ikan dapat memengaruhi beberapa karakteristik *edible film* secara signifikan, seperti kekuatan tarik, elongasi, transmitansi dan transparansi, kelarutan, permeabilitas uap air, aktivitas antioksidan, dan aktivitas antibakteri. *Edible film* dengan penambahan FLE 10% memiliki karakteristik fisiko-kimia dan mikrobiologis yang paling baik dengan nilai kekuatan tarik, elongasi, kelarutan, permeabilitas uap air, aktivitas antioksidan, dan aktivitas antibakteri terhadap *S. aureus* dan *E. coli* masing-masing sebesar 2,74 MPa, 372,82%, 36,20%, 3,96 × 10−11 g/msPa, 45,49%, 27,27 mm, dan 25,10 mm. Daging sapi yang dikemas dengan edible film berbasis gelatin dengan penambahan ekstrak daun tin mampu mempertahankan kualitas daging sampai hari ke-5 penyimpanan dengan nilai total bakteri sebesar 5,56 log cfu/g, *hardness* 1,3 N; dan warna merah (*a**) 14,07. Secara keseluruhan, penelitian ini menunjukkan potensi *edible film* berbasis gelatin kulit ikan yang ditambahkan FLE sebagai *active packaging* yang ramah lingkungan, mudah terurai dan berkelanjutan.

Kata kunci: *edible film*, gelatin ikan, kemasan berkelanjutan, *Ficus carica* L.

CHARACTERISTICS OF EDIBLE FILMS BASED ON MACKEREL SKIN GELATIN (*Scomberomorus commerson*) WITH THE ADDITION OF FIG LEAVES (*Ficus carica* L.) ETHANOLIC EXTRACT AND THEIR EFFECTS ON BEEF QUALITY

ABSTRACT

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The increasing use of petroleum-based plastics, which can cause environmental issues, has prompted efforts to develop environmentally friendly active food packaging materials, one of which is edible film. Although the use of fish gelatin-based edible film as active packaging is an attractive option. Fig leaf extract (FLE) is highly accessible at an affordable price. Additionally, FLE is known for its antioxidant properties, capable of capturing and inhibiting free radicals. The aim of this research is to develop fish skin-based edible film with the addition of fig leaf extract (Ficus carica L.).

The production of edible film in this study was carried out by adding FLE to mackerel fish skin gelatin with concentration variations (2.5–10% w/w). The results showed that the addition of FLE to fish skin gelatin-based edible film could significantly affect several characteristics of the edible film, such as tensile strength, elongation, transmittance and transparency, solubility, water vapor permeability, antioxidant activity, and antibacterial activity. Edible film with 10% FLE addition had the best physicochemical and microbiological characteristics with tensile strength, elongation, solubility, water vapor permeability, antioxidant activity, and antibacterial activity against S. aureus and E. coli of 2.74 MPa, 372.82%, 36.20%, 3.96 × 10−11 g/msPa, 45.49%, 27.27 mm, and 25.10 mm, respectively. Beef packaged with gelatin-based edible film with fig leaf extract addition was able to maintain meat quality up to the 5th day of storage with a total bacterial count of 5.56 log cfu/g, lower than that of the control group (without packaging) and films solely wrapped in plastic wrap. Meanwhile, the hardness value and redness color (*a**) of the beef with edible film treatment are higher than other treatments, 1.3 N and 14.07, respectively. Overall, this research demonstrates the potential of fish skin-based gelatin edible film with added FLE as environmentally friendly, easily degradable, and sustainable active packaging.

Keywords: edible film, fish gelatin, sustainable packaging, *Ficus carica* L.