

INTISARI

PENGARUH PENAMBAHAN *CARBOXY METHYL CELLULOSE* TERHADAP MUTU FISIK DAN KIMIA *EDIBLE FILM* GELATIN TULANG IKAN NILA MERAH

Edible film diaplikasikan sebagai pengemas produk pangan yang aman dikonsumsi dan ramah lingkungan. Penelitian bertujuan untuk menganalisis pengaruh penambahan konsentrasi CMC terhadap karakteristik fisik, mekanik, dan fungsional dari *edible film* yang berbahan dasar dari gelatin tulang ikan nila merah. Bahan utama pembuatan *edible film* ini adalah gelatin. Gelatin diekstraksi dari tulang ikan nila merah menggunakan metode asam. Diperoleh gelatin yang memiliki pH sebesar 5,42; kadar air 4,09%; kadar abu 1,73%; kekuatan gel 157 gram *Bloom*; viskositas 5,24 cP. Mutu gelatin yang diperoleh dari ekstraksi tulang ikan nila merah sudah memenuhi SNI dan GMIA, sehingga dapat digunakan sebagai bahan dasar pembuatan *edible film*. Formulasi pembuatan *edible film* yang digunakan adalah gelatin 10%, karagenan kappa 3%, dan gliserol 3%, dengan konsentrasi CMC 0% (p0); CMC 1% (p1); CMC 2% (p2); CMC 3% (p3). Karakteristik *edible film* yang dihasilkan yaitu ketebalan 0,12-0,32; warna 46-61 (L^*), 0,8-2,4 (a^*) dan 2,8-13,5 (b^*); kadar air 11,15-15,57%; kuat tarik 0,29-0,91 MPa; elongasi 16,8-184,6 %; kelarutan 35-73%; dan laju transmisi uap air 3,6-6,8 g/m².hari. Karakteristik *edible film* yang terbaik dihasilkan dari perlakuan p1, masing-masing yaitu: ketebalan, kuat tarik (0,58 MPa), elongasi (92,63 %), dan laju transmisi uap air (6 g/m²/24 jam) menurut *Japanese Industrial Standard* (JIS).

Kata kunci: nila merah, tulang, gelatin, CMC, *edible film*, karakteristik

ABSTRACT

EFFECT OF CARBOXYMETHYL CELLULOSE ADDITION ON THE PHYSICAL AND CHEMICAL QUALITIES OF EDIBLE FILM MADE FROM RED TILAPIA FISH BONE GELATIN

Edible films are applied as packaging materials for food products that are safe for consumption and environmentally friendly. This study aimed to analyze the effect of varying CMC concentrations on the physical, mechanical, and functional characteristics of edible films made from red tilapia bone gelatin. The main ingredient in the edible film formulation was gelatin, which was extracted from red tilapia bones using an acid method. The extracted gelatin showed a pH of 5.42, a moisture content of 4.09%, an ash content of 1.73%, a gel strength of 157 Bloom grams, and a viscosity of 5.24 cP. The quality of the gelatin obtained from red tilapia bone extraction met the standards of SNI and GMIA, indicating its suitability as a base material for edible film production. The edible film formulation consisted of 10% gelatin, 3% kappa carrageenan, and 3% glycerol, with CMC concentrations of 0% (p0), 1% (p1), 2% (p2), and 3% (p3). The resulting edible films exhibited thickness values of 0.12–0.32 mm; color values of 46–61 (L^*), 0.8–2.4 (a^*), and 2.8–13.5 (b^*); moisture content of 11.15–15.57%; tensile strength of 0.29–0.91 MPa; elongation of 16.8–184.6%; solubility of 35–73%; and water vapor transmission rates of 3.6–6.8 g/m²·day. The best edible film characteristics were obtained from treatment p1, including thickness, tensile strength (0.58 MPa), elongation (92.63%), and water vapor transmission rate (6 g/m²·24 h), meeting the Japanese Industrial Standards (JIS).

Keywords: red tilapia, bone, gelatin, CMC, edible film, characteristics