Pembuatan Edible Film Berbasis Pati Singkong Termodifikasi Minyak Kayu Manis dan Madu Kaliandra untuk Alternatif Kemasan Bumbu Mie Instan = Preparation of Edible Film Based on Cassava Starch Modified with Cinnamon Essential Oil and Calliandra Honey for Alternative Packaging of Instant Noodle Seasoning

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Abstrak

Pengembangan bahan kemasan makanan yang ramah lingkungan dan praktis merupakan tantangan penting dalam industri makanan saat ini. Salah satu solusi yang dapat dilakukan adalah penggunaan edible film, yaitu alternatif kemasan yang dapat terurai secara alami dan aman untuk makanan. Dalam penelitian ini, dilakukan pembuatan edible film berbasis pati singkong (Manihot esculenta) yang dimodifikasi dengan minyak kayu manis (Cinnamomum verum) dan madu kaliandra sebagai alternatif kemasan bumbu mie instan. Edible film ini dibuat menggunakan metode cetakan melalui termoformasi dengan suhu gelatinisasi 70oC. Variasi konsentrasi minyak kayu manis (MKM) sebesar 0,5%, 1%, 1,5%, 2% (w/v), madu kaliandra (MK) sebesar 1%, 1,5%, 2% (w/v), dan campuran minyak kayu manis dan madu kaliandra dengan rasio 1:1. Penambahan MKM dan MK meningkatkan ketebalan edible film (0,15–0,39 mm), tetapi menurunkan solubilitas edible film dalam air (18,81–34,86%) dan absorbansi spesifik (0,58–1,18 mm-1). Permeabilitas uap air edible film mengalami fluktuasi (0,12– 8,47 × 10-12 g.cm/cm2 .s.Pa). Sifat mekanik edible film, seperti kekuatan tarik (0,85–2,09 MPa) dan perpanjangan saat patah (5,12–26,38%), meningkat setelah penambahan MK dan MKM-MK. Namun, sifat mekanik cenderung menurun setelah penambahan MKM dengan kekuatan tarik sebesar 0,49–0,71 MPa dan perpanjangan saat patah sebesar 14,33–23,85%. Pada penelitian ini juga dilakukan uji organoleptik yang melibatkan aroma, rasa, dan kesukaan oleh 10 panelis. Hasil uji organoleptik menunjukkan peningkatan sensori dan kesukaan panelis setelah menggunakan edible film variasi terbaik dibandingkan dengan variasi kontrol. Berdasarkan hasil penelitian ini, diperoleh bahwa variasi dengan konsentrasi MKM-MK 1% merupakan variasi terbaik dan dapat digunakan sebagai alternatif kemasan bumbu mie instan.

.....The development of environmentally friendly and practical food packaging materials is an important challenge in the food industry today. One solution that can be adopted is the use of edible film, an alternative packaging material that is biodegradable and safe for food (food grade). In this study, edible film based on cassava starch (Manihot esculenta) were developed and modified with cinnamon essential oil (Cinnamomum verum) and Calliandra honey as a packaging alternative for instant noodle seasoning. The edible films were prepared using a casting method via thermoforming with a gelatinization temperature of 70°C. Cinnamon essential oil (CEO) concentrations of 0.5%, 1%, 1.5%, 2% (w/v), Calliandra honey (CH) concentrations of 1%, 1.5%, 2% (w/v), and a combination of CEO and CH with a 1:1 ratio were used. The addition of CEO and CH increased the thickness of the edible films (0.15–0.39 mm), while reducing their solubility in water (18.81–34.86%) and specific absorbance (0.58–1.18 mm-1). The water vapor permeability of the edible films fluctuated (0.12–8.47 × 10-12 g.cm/cm2 .s.Pa). The mechanical properties of the edible films, such as tensile strength (0.85–2.09 MPa) and elongation at break (5.12–26.38%), improved after the addition of CH and the CEO-CH. However, the mechanical properties tended to decrease

after the addition of CEO with tensile strength values of 0.49–0.71 MPa and elongation at break values of 14.33–23.85%. Sensory evaluation involving aroma, taste, and preference was conducted with a panel of 10 individuals. The results of the sensory evaluation showed improved sensory perception and preference for the best-performing edible film variations compared to the control. Based on the findings of this study, it can be concluded that the variation with a 1% concentration of CEO-CH is the most suitable and can be used as an alternative packaging material for instant noodle seasoning.