

ABSTRAK

PENGARUH PENAMBAHAN VARIASI KONSENTRASI PROTEIN WHEY SEBAGAI BIOPOLIMER TAMBAHAN TERHADAP KARAKTERISTIK *EDIBLE FILM* BERBAHAN DASAR ALGINAT DARI ALGA COKELAT (*Sargassum sp.*)

Plastik pengemas makanan dalam proses pembuatannya menggunakan minyak bumi yang ketersediaannya semakin berkurang dan sulit diperbaharui (*non-renewable*), serta keberadaannya yang sulit didegradasi oleh mikroba tanah dapat menyebabkan terjadinya pencemaran serta kerusakan lingkungan. Hal inilah yang mendorong adanya pengembangan teknologi jenis kemasan yang *biodegradable*. *Edible film* dari polimer alam merupakan salah satu solusi alternatif kemasan makanan yang bersifat ramah lingkungan dan dapat mempertahankan kualitas makanan. *Edible film* berbahan dasar alginat dari alga cokelat merupakan salah satu upaya untuk mengurangi limbah plastik yang tidak dapat terdegradasi oleh mikroorganisme. Selain itu produksi alga cokelat di Indonesia sangat melimpah dan masih belum dimanfaatkan secara maksimal. Akan tetapi, *edible film* berbahan alginat memiliki sifat mekanik dan ketahanan air yang masih rendah. Oleh karena itu, pada penelitian ini dilakukan pembuatan *edible film* dari alginat dengan penambahan protein *whey* dan gliserol. Protein *whey* ini berperan sebagai biopolimer tambahan yang akan meningkatkan sifat mekanik *edible film*. Sedangkan gliserol ditambahkan untuk meningkatkan elastisitas dan fleksibilitas *edible film*. Metode penelitian yang dilakukan meliputi dua tahap. Pertama, isolasi dan karakterisasi Na-alginat. Kedua, preparasi *edible film* dan karakterisasi *edible film*. Hasil karakterisasi Na-alginat diperoleh rendemen 25,12%, kadar air 27,03% dan kadar abu 19,69%. Hasil karakterisasi *edible film* menunjukkan nilai daya serap dan kuat tarik yang paling baik terdapat pada formula alginat-protein *whey* 11% berturut-turut sebesar 63,62% dan 17,59 MPa. Kemudian nilai elongasi tertinggi terdapat pada formulasi alginat-protein *whey* 11% sebesar 35,84%. Sedangkan pada hasil FTIR tidak ditemukan gugus fungsi baru sehingga hal ini menunjukkan bahwa *edible film* yang terbentuk merupakan proses pencampuran (*blending*) secara fisika.

Kata-kata kunci: alga cokelat; Na-alginat; *Edible film*; gliserol; *protein whey*.

ABSTRACT

THE EFFECT OF ADDING VARIATIONS IN THE CONCENTRATION OF WHEY PROTEIN AS AN ADDITIONAL BIOPOLYMER TO THE CHARACTERISTICS OF THE EDIBLE FILM MADE FROM ALGINATE FROM BROWN ALGAE (*Sargassum sp.*)

Food packaging plastic in the manufacturing process using petroleum which is increasingly available and difficult to renew (non-renewable), and its existence which is difficult to be degraded by soil microbes can cause pollution and environmental damage. This is what drives the development of biodegradable packaging type technology. Edible films from natural polymers are one alternative food packaging solution that is environmentally friendly and can maintain food quality. Edible film made from alginate from brown algae is an effort to reduce plastic waste that cannot be degraded by microorganisms. Besides that, the production of brown algae in Indonesia is very abundant and is still not fully utilized. However, edible films made from alginate have low mechanical properties and water resistance. Therefore, in this study the manufacture of edible films from alginate was carried out with the addition of whey and glycerol proteins. This whey protein acts as an additional biopolymer that will improve the mechanical properties of edible films. While glycerol is added to increase elasticity and flexibility of edible films. The research method that is carried out includes two stages. First, isolation and characterization of Na-alginate. Secondly, preparation of edible films and characterization of edible films. The results of Na-alginate characterization obtained 25.12% yield, 27.03% moisture content and 19.69% ash content. The results of the characterization of edible films showed the best absorption and tensile strength were found in whey 11% protein alginate formula 63.62% and 17.59 MPa, respectively. Then the highest elongation value was found in the formulation of whey 11% alginate-protein at 35.84%. Whereas in the FTIR results there were no new functional groups found so this shows that the edible film formed is a process of blending in physics

Keywords: *brown algae; Na-alginate; Edible film; glycerol; whey protein.*