

Abstract

Edible film is one of the packaging that can be applied to food because it is biodegradable. Alginate may be used as an ingredient for making edible films. The addition of chitosan as an antibacterial can increase the ability of edible films. This study aims to obtain the best shelf life of instant bir pletok packaged with an antibacterial edible film based on alginate and chitosan. This study consists of three stages, the first stage is the formulation of antibacterial edible film using the experimental method of Completely Randomized Factorial Design with 2 factors, namely the concentration of alginate (A) has 2 levels (A1=1%, A2=2%) and the concentration of chitosan (B) has 3 levels (B1=1%, B2=1,5%, B3=2%) with 2 repetitions. Then the second stage is estimating the shelf life of instant bir pletok using the Labuza critical water content method. Then the third stage is the validation of the storage of instant bir pletok packaged in antibacterial edible film using the Completely Randomized Factorial Design experimental method with 2 factors, namely the packaging treatment (A) has 2 levels (A1=control, A2=packaged) and storage time (B) has 5 levels (B1=M0, B2=M1, B3=M2, B4=M3, B5=M4) with 2 repetitions. The first stage data were analyzed at $\alpha=0.05$ using multiple linear regression. The third stage data were analyzed at $\alpha=0.05$ using analysis of variance (ANOVA). If there is a significant difference, it is continued with Duncan's test. The quality of edible film was investigated based on the parameters of WVTR, solubility, thickness, opacity, color, tensile strength, elongation, SEM, water content and clear zone. The quality of instant bir pletok at the storage validation stage was investigated based on water content, aw, color, ALT and organoleptic. The results showed that the best edible film formulations were alginate concentration of 1,5% and chitosan concentration of 1,5%. Based on the calculation of the critical moisture content of Labuza for instant bir pletok with edible film packaging, it is estimated that it has a shelf life of 3 days. Meanwhile, at the storage validation stage, it showed that the shelf life of instant bir pletok packaged with antibacterial edible film at 28 days still had good quality.

Keywords: Critical Moisture Content, Labuza, Water Vapor Transmission Rate

Abstrak

Edible film merupakan salah satu kemasan yang dapat diaplikasikan pada bahan pangan karena sifatnya yang dapat terurai secara alami. Alginat berpotensi sebagai bahan pembuatan edible film. Penambahan kitosan sebagai antibakteri dapat meningkatkan kemampuan edible film. Penelitian ini bertujuan untuk mendapatkan masa simpan bir pletok instan terbaik yang dikemas dengan edible film antibakteri berbasis alginat dan kitosan. Penelitian ini terdiri dari tiga tahap, tahap I yaitu formulasi edible film antibakteri menggunakan metode eksperimen Rancangan Acak Lengkap Faktorial dengan 2 faktor, yaitu konsentrasi alginat (A) memiliki 2 taraf (A1=1%, A2=2%) dan konsentrasi kitosan (B) memiliki 3 taraf (B1=1%, B2=1,5%, B3=2%) dengan dilakukan 2 kali pengulangan. Kemudian tahap II yaitu pendugaan masa simpan bir pletok instan menggunakan metode kadar air kritis Labuza. Selanjutnya tahap III yaitu validasi penyimpanan bir pletok instan yang dikemas edible film antibakteri menggunakan metode eksperimen Rancangan Acak Lengkap Faktorial dengan 2 faktor, yaitu perlakuan kemasan (A) memiliki 2 taraf (A1=kontrol, A2=dikemas) dan lama penyimpanan (B) memiliki 5 taraf (B1=M0, B2=M1, B3=M2, B4=M3, B5=M4) dengan dilakukan 2 kali pengulangan. Data tahap I dianalisis pada $\alpha=0,05$ menggunakan regresi linear berganda. Data tahap III dianalisis pada $\alpha=0,05$ menggunakan analisis varian (ANAVA). Apabila terdapat perbedaan nyata maka dilanjutkan dengan uji Duncan. Mutu edible film diteliti berdasarkan parameter WVTR, kelarutan, ketebalan, opacity, warna, kuat tarik, elongasi, SEM, kadar air dan zona bening. Adapun mutu bir pletok instan pada tahap validasi penyimpanan diteliti berdasarkan kadar air, aw, warna, ALT dan organoleptik. Hasil penelitian menunjukkan formulasi edible film terbaik adalah konsentrasi alginat 1,5% dan konsentrasi kitosan 1,5%. Berdasarkan hasil perhitungan kadar air kritis Labuza terhadap bir pletok instan dengan kemasan edible film diduga memiliki masa simpan 3 hari. Adapun pada

tahap validasi penyimpanan menunjukkan bahwa masa simpan bir pletok instan yang dikemas *edible film* antibakteri pada 28 hari masih memiliki mutu yang baik.

Kata kunci: Kadar Air Kritis, Labuza, Laju Transmisi Uap Air