PEMBUATAN *BIODEGRADABLE FOAM* (*BIOFOAM*) BERBAHAN BAKU SELULOSA SABUT KELAPA SAWIT (*FIBER*) DENGAN PENAMBAHAN PVA (POLIVINIL ALKOHOL)

ANJELIKA ZAHARA
2111131010

FAKULTAS TEKNOLOGI PERTANIAN
UNIVERSITAS ANDALAS
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Anjelika Zahara, Deivy Andhika Permata, Neswati

ABSTRAK

Sabut kelapa sawit merupakan limbah padat yang terbentuk dari proses pengempaan buah kelapa sawit menggunakan *screw press* pada stasiun pengepresan kelapa sawit. Tingginya kandungan selulosa pada sabut kelapa sawit dapat dimanfaatkan sebagai bahan baku pembuatan kemasan makanan yaitu *biodegradable foam* (*biofoam*) untuk meningkatkan sifat fisik dan sifat mekaniknya. *Biofoam* merupakan alternatif kemasan ramah lingkungan yang berfungsi sebagai pengganti *styrofoam* konvensional. *Biofoam* diproduksi dari bahan yang mengandung pati, selulosa, *plasticizer* dan polivinil alkohol (PVA) sebagai bahan penguat sifat mekanik. Penelitian ini bertujuan untuk mengkaji pengaruh interaksi penambahan selulosa sabut kelapa sawit dan PVA terhadap karakteristik *biofoam*, sehingga dihasilkan *biofoam* dengan karakteristik terbaik. Penelitian ini menggunakan Rancangan Acak Lengkap 2 faktorial dengan 3 kali ulangan, serta dianalisis menggunakan *Analisis of Variance*. Jika hasil analisis berbeda nyata, dilanjutkan uji *Duncan's New Multiple Range Test* pada taraf 5%. Perlakuan penelitian ini yaitu penambahan selulosa sabut kelapa sawit 15% dan 20%, dan penambahan PVA 10%, 15% dan 20%. Hasil penelitian menunjukkan bahwa terdapat interaksi dan berbeda nyata antara penambahan selulosa sabut sabut kelapa sawit dan PVA terhadap kuat tarik, daya serap air, kadar air dan kuat tekan *biofoam*, tetapi tidak berbeda nyata terhadap biodegradasi dan densitas *biofoam.* Perlakuan terbaik yang diperoleh berdasarkan perhitungan metode *Analytical Hierarchy Process* (AHP) yaitu perlakuan A2B3 dengan komposisi selulosa sabut kelapa sawit (20%) dan PVA (20%). Perlakuan ini menghasilkan nilai kuat tekan 0,44 MPa, kuat tarik 1,65 MPa, biodegradasi 18,34% selama 14 hari, daya serap air 2,58%, densitas 1,29 g/cm^3, dan kadar air 19,53%.

Kata Kunci: *biofoam*, PVA, sabut kelapa sawit, selulosa

PRODUCTION OF BIODEGRADABLE FOAM (BIOFOAM) FORM OIL PALM FIBER CELLULOSE WITH THE ADDITIONAL OF POLYVINYL ALCOHOL (PVA)

Anjelika Zahara, Deivy Andhika Permata, Neswati

ABSTRACT

Oil palm fiber is a solid waste generated from the pressing process of oil palm fruit using a screw press at the palm oil pressing station. The high cellulose content in oil palm fiber can be utilized as a raw material for the production of food packaging materials, namely biodegradable foam (biofoam), to improve its physical and mechanical properties. Biofoam is an environmentally friendly packaging alternative that functions as a substitute for conventional styrofoam. Biofoam is produced from materials containing starch, cellulose, plasticizers, and polyvinyl alcohol (PVA) as a reinforcing agent to enhance mechanical properties. This study aims to examine the effect of the interaction between the addition of oil palm fiber cellulose and PVA on the characteristics of biofoam in order to obtain biofoam with the best characteristics. The study employed a factorial Completely Randomized Design with two factors and three replications and was analyzed using Analysis of Variance (ANOVA). If the results showed significant differences, the analysis was continued using Duncan's New Multiple Range Test at a 5% significance level. The treatments in this study consisted of the addition of oil palm fiber cellulose at concentrations of 15% and 20%, and the addition of PVA at concentrations of 10%, 15%, and 20%. The results showed that there was a significant interaction between the addition of oil palm fiber cellulose and PVA on the tensile strength, water absorption, moisture content, and compressive strength of the biofoam, but no significant effect on the biodegradation and density of the biofoam. The best treatment based on the calculation using the Analytical Hierarchy Process (AHP) method was treatment A2B3 with a composition of oil palm fiber cellulose (20%) and PVA (20%). This treatment produced a compressive strength value of 0.44 MPa, tensile strength of 1.65 MPa, biodegradation of 18.34% within 14 days, water absorption of 2.58%, density of 1.29 g/cm^3, and moisture content of 19.53%.

Keywords: biofoam, cellulose, oil palm fiber, PVA