KARAKTERISTIK *BIODEGRADABLE FOAM* BERBASIS SELULOSA SERAT SABUT KELAPA *(Cocos nucifera* L.*)* DAN *POLYVINYL ALCOHOL* (PVA)

ELLA GUSTINA PUTRI
2111131016

FAKULTAS TEKNOLOGI PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2026

KARAKTERISTIK *BIODEGRADABLE FOAM* BERBASIS SELULOSA SERAT SABUT KELAPA *(Cocos nucifera* L.*)* DAN *POLYVINYL ALCOHOL* (PVA)

Ella Gustina Putri, Deivy Andhika Permata, Kurnia Harlina Dewi

ABSTRAK

Indonesia merupakan salah satu negara dengan jumlah sampah plastik yang cukup tinggi, khususnya dari kemasan makanan berbahan *styrofoam.* Kondisi ini mendorong pengembangan alternatif kemasan ramah lingkungan berupa *biodegradable foam (biofoam)* yang dapat terdegradasi secara alami. *Biodegradble foam (biofoam)* merupakan kemasan ramah lingkungan dibuat dari bahan alami seperti pati, namun *biofoam* berbahan pati murni memiliki kelemahan berupa sifat mekanik rendah dan daya serap air yang tinggi, sehingga diperlukan penambahan serat alami dan polimer sintetis untuk meningkatkan kualitasnya. Penelitian ini bertujuan untuk mengetahui pengaruh perbedaan konsentrasi selulosa serat sabut kelapa dan *polyvinyl alcohol* (PVA) terhadap karakteristik fisik dan mekanik *biofoam,* sehingga dihasilkan *biofoam* dengan karakteristik terbaik. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) 2 Faktorial dengan 9 perlakuan dan 3 kali ulangan. Data yang diperoleh dianalisis secara statistik menggunakan *Analysis of Variance* (ANOVA), jika hasil menunjukkan adanya pengaruh berbeda nyata interaksi konsentrasi selulosa serat sabut kelapa dan PVA maka dilanjutkan dengan uji DNMRT pada taraf 5%. Hasil penelitian menunjukkan perbedaan konsentrasi selulosa serat sabut kelapa dan PVA berpengaruh nyata terhadap karakteristik *biofoam.* Berdasarkan perhitungan dengan metode *Analitical Hierarchy Process* (AHP) didapatkan perlakuan terbaik dalam pembuatan *biofoam* berbasis selulosa serat sabut kelapa dan PVA adalah perlakuan A3B1 dengan komposisi selulosa serat sabut kelapa 20% dan PVA 10%. Perlakuan ini menghasilkan nilai kuat tarik 0,51 MPa, biodegradasi 47,91% selama 30 hari, daya serap air 2,72%, densitas 1,34 g/cm^3, dan kadar air 23,44%.

Kata Kunci: AHP, *biodegradable foam,* PVA, selulosa

CHARACTERISTICS OF BIODEGRADABLE FOAM BASED ON COCONUT COIR FIBER CELLULOSE (COCOS NUCIFERA L.) AND POLYVINYL ALCOHOL (PVA)

Ella Gustina Putri, Deivy Andhika Permata, Kurnia Harlina Dewi

ABSTRACT

Indonesia is one of the countries with a relatively high amount of plastic waste, particularly from styrofoam based food packaging. This condition has encouraged the development of environmentally friendly packaging alternatives in the form of biodegradable foam (biofoam), which can degrade naturally. Biodegradable foam (biofoam) is an eco-friendly packaging material made from natural resources such as starch; however, starch-based biofoam has drawbacks, including low mechanical properties and high water absorption capacity. Therefore, the addition of natural fibers and synthetic polymers is required to improve its quality. This study aims to determine the effect of different concentrations of coconut coir fiber cellulose and polyvinyl alcohol (PVA) on the physical and mechanical characteristics of biofoam, in order to obtain biofoam with the best characteristics. The research employed a Completely Randomized Design (CRD) with a 2-factor factorial arrangement, consisting of 9 treatments and 3 replications. The data obtained were statistically analyzed using Analysis of Variance (ANOVA). If the results showed a significant interaction effect between the concentrations of coconut coir fiber cellulose and PVA, further analysis was conducted using Duncan's New Multiple Range Test (DNMRT) at a 5% significance level. The results indicated that variations in the concentrations of coconut coir fiber cellulose and PVA significantly affected the characteristics of biofoam. Based on calculations using the Analytical Hierarchy Process (AHP) method, the best treatment for biofoam production was A3B1, with a composition of 20% coconut coir fiber cellulose and 10% PVA. This treatment produced biofoam with a tensile strength of 0,51 Mpa, biodegradation of 47,91% over 30 days, water absorption of 2,72%, density of 1,34 g/cm^3, and moisture content of 23,44%.

Keywords: AHP, biodegradable foam, cellulose, PVA