

FORMULASI *BIODEGRADABLE FOAM* BERBASIS ONGGOK AREN DAN SELULOSA JERAMI PADI DENGAN PENAMBAHAN GELATIN DAN TAPIOKA

INTISARI

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Styrofoam merupakan kemasan sekali pakai yang banyak digunakan pada industri pangan yang bersifat tidak ramah lingkungan. *Biodegradable foam* sebagai alternatif pengganti *styrofoam* perlu dikembangkan. Onggok aren dan jerami padi merupakan biomassa yang berpotensi dimanfaatkan sebagai *biodegradable foam*. Pembuatan *biodegradable foam* memerlukan bahan tambahan dengan formulasi untuk mendapatkan hasil *biodegradable foam* yang baik.

Penelitian ini bertujuan untuk mengetahui kandungan selulosa, hemiselulosa, lignin, dan pati pada bahan serta mengetahui *biodegradable foam* yang dihasilkan berdasarkan parameter kuat tarik, daya serap air, densitas, dan biodegradabilitas. *Biodegradable foam* dibuat dengan campuran onggok aren, selulosa jerami, gelatin, dan tapioka dengan proses *thermopressing*. Desain eksperimen yang digunakan yaitu pendekatan Taguchi dengan jenis *orthogonal arrays* $L_9(3)^4$. Adapun metode analisis data yang dilakukan yaitu analisis *Signal to Noise Ratio* (SNR), ANOVA, dan Uji Kruskal-Wallis.

Berdasarkan hasil pengujian diperoleh kandungan bahan yaitu onggok aren mengandung sejumlah 45,639% hemiselulosa; 13,674% selulosa; 8,642% lignin; 31,29% pati serta jerami padi mengandung sejumlah 23,30% hemiselulosa; 35,57% selulosa; dan 17,35% lignin. *Biodegradable foam* yang dihasilkan memiliki nilai kuat tarik 0,31-1,42 MPa; daya serap air 19,706-45,069%; biodegradabilitas 34,755-100%; densitas 0,252-0,543. Berdasarkan hasil penelitian, onggok aren; jerami padi; gelatin berpengaruh signifikan terhadap kuat tarik serta onggok aren berpengaruh signifikan pada nilai densitas.

Kata kunci: *Biodegradable foam*, jerami padi, kemasan, onggok aren, *orthogonal arrays*

FORMULATION OF BIODEGRADABLE FOAM BASED ON SUGAR PALM DREG AND RICE STRAW CELLULOSE WITH ADDITION OF GELATIN AND TAPIOCA

ABSTRACT

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Styrofoam is a widely used as single-use packaging in the food industry. However, styrofoam is environmentally unfriendly. Biodegradable foam as an alternative to styrofoam needs to be developed. Sugar palm dreg and rice straw are biomass materials with potential to be utilized as biodegradable foam. The production of biodegradable foam requires additional materials with formulations to achieve good biodegradable foam results.

This study aims to determine the content of cellulose, hemicellulose, lignin, and starch in the materials and to assess the biodegradable foam produced based on parameters such as tensile strength, water absorption capacity, density, and biodegradability. Biodegradable foam is made by mixing sugar palm dreg, rice straw cellulose, gelatin, and tapioca then formed by the thermopressing process. The experimental design used is the Taguchi approach with orthogonal arrays $L_9(3)^4$. The data analysis methods used are Signal to Noise Ratio (SNR), ANOVA, and Kruskal-Wallis Test.

Based on the test results, the material content obtained is as follows: sugar palm dreg contains 45.639% hemicellulose; 13.674% cellulose; 8.642% lignin; 31.29% starch, while rice straw contains 23.30% hemicellulose; 35.57% cellulose; and 17.35% lignin. The biodegradable foam produced has tensile strength values ranging from 0.31 to 1.42 MPa; water absorption capacity of 19.706% to 45.069%; biodegradability of 34.755% to 100%; density of 0.252 to 0.543. Based on the research results, sugar palm dreg; rice straw; gelatin have a significant effect on tensile strength, and sugar palm dreg has a significant effect on density values.

Keywords: Biodegradable foam, orthogonal arrays, packaging, rice straw, sugar palm dreg