

## KARAKTERISASI *BIODEGRADABLE FOAM* DARI ONGGOK AREN DAN JERAMI PADI MELALUI VARIASI PROSES *BLEACHING*

### INTISARI

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Sampah kemasan makanan yang sulit terurai seperti *styrofoam* menjadi permasalahan lingkungan yang sulit untuk dikendalikan sehingga diperlukan bahan pengemas makanan yang ramah lingkungan untuk mengatasi permasalahan lingkungan tersebut. Onggok aren dan jerami padi memiliki potensi besar untuk dikembangkan lebih lanjut sebagai bahan pengemas makanan. Onggok aren yang mengandung pati dan jerami padi yang mengandung selulosa sangat berpotensi sebagai bahan pengemas makanan yang ramah lingkungan. Oleh karena itu, dilakukan pengembangan potensi *biodegradable foam* sebagai alternatif kemasan pengganti *styrofoam*. *Biodegradable foam* akan dibuat dari potensi yang ada pada limbah onggok aren dan jerami padi setidaknya memiliki karakterisasi yang hampir sama dengan *styrofoam*. Tujuan pada penelitian ini untuk mengetahui karakterisasi *biodegradable foam* berdasarkan sifat fisis, mekanis, dan biodegradabilitas.

Sifat fisis uji daya serap air terdapat perbedaan nyata hasil daya serap air berdasarkan onggok aren. Daya serap air terendah 12,40% pada sampel ( $X_2Y_1$ )HP dan daya serap tertinggi 28,27% pada sampel ( $X_1Y_2$ )HP. Sifat fisis uji densitas terdapat perbedaan nyata hasil densitas berdasarkan variasi proses *bleaching* dan terdapat interaksi antara onggok aren, ukuran jerami padi, dan variasi proses *bleaching* dalam mempengaruhi hasil densitas. Densitas tertinggi 0,51 g/cm<sup>3</sup> pada sampel ( $X_1Y_2$ )HP dan densitas terendah 0,31 g/cm<sup>3</sup> pada sampel ( $X_1Y_1$ )AS. Sifat mekanis uji kekuatan tarik terdapat perbedaan nyata hasil kekuatan tarik berdasarkan onggok aren dan variasi proses *bleaching*; terdapat interaksi antara onggok aren dengan variasi proses *bleaching* dan interaksi antara ukuran jerami padi dengan variasi proses *bleaching* dalam mempengaruhi hasil kekuatan tarik. Kekuatan tarik terbesar 1,58 MPa pada sampel ( $X_2Y_1$ )HP dan kekuatan tarik terkecil 0,49 MPa pada sampel ( $X_1Y_2$ )AS. Sifat biodegradabilitas uji tingkat biodegradasi terdapat perbedaan nyata hasil tingkat biodegradasi berdasarkan onggok aren dan terdapat perbedaan nyata hasil tingkat biodegradasi berdasarkan variasi proses *bleaching*. Tingkat biodegradasi tertinggi 31,13% pada sampel ( $X_1Y_1$ )HP dan tingkat biodegradasi terendah 14,34% pada sampel ( $X_2Y_3$ )AS.

Kata kunci: *biodegradable foam*, biodegradasi, daya serap, densitas, kekuatan tarik

***CHARACTERIZATION OF BIODEGRADABLE FOAM FROM PALM DREG  
AND RICE STRAW THROUGH VARIATION OF BLEACHING  
PROCESSES***

**ABSTRACT**

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Waste from non-biodegradable food packaging, such as styrofoam, poses a challenging environmental issue that is difficult to control. Therefore, there is a need for environmentally friendly food packaging materials to address this environmental problem. Sugar palm dreg and rice straw have significant potential for further development as eco-friendly food packaging materials. Sugar palm dreg, which containing starch, and rice straw, which containing cellulose, show great potential as environmentally friendly food packaging materials. Hence, the development of the potential of biodegradable foam as an alternative to styrofoam packaging is undertaken, utilizing the waste from sugar palm dregs and rice straw, aiming to achieve characteristics similar to styrofoam. The objective of this research is to characterize the biodegradable foam based on its physical, mechanical, and biodegradability properties.

In terms of physical properties, the water absorption test reveals a significant difference in water absorption results based on sugar palm dreg. The lowest water absorption is 12.40% in sample (X2Y1)HP, while the highest is 28.27% in sample (X1Y2)HP. For density, a significant difference is observed in density results based on bleaching process variations, with an interaction between sugar palm dreg, size of rice straw, and bleaching process variations affecting density results. The highest density is 0.51 g/cm<sup>3</sup> in sample (X1Y2)HP, while the lowest is 0.31 g/cm<sup>3</sup> in sample (X1Y1)AS. Regarding mechanical properties, the tensile strength test shows a significant difference in tensile strength based on sugar palm dreg and bleaching process variations. There is an interaction between palm dreg and bleaching process variations, as well as an interaction between the size of rice straw and bleaching process variations, influencing tensile strength results. The highest tensile strength is 1.58 MPa in sample (X2Y1)HP, while the lowest is 0.49 MPa in sample (X1Y2)AS. In terms of biodegradability, the biodegradation rate test reveals a significant difference in biodegradation rates based on sugar palm dreg and variations in the bleaching process. The highest biodegradation rate is 31.13% in sample (X1Y1)HP, while the lowest is 14.34% in sample (X2Y3)AS.

**Keywords:** *biodegradable foam, biodegradation, density, tensile strength, water absorption*