

# PROPORTION OF RICE STRAW AND USED HVS PAPER TO THE PHYSICAL QUALITY OF PAPER

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## ABSTRACT

Processing of rice straw through burning causes air pollution and produces greenhouse gas emissions. Therefore it was needed an innovation in the use of rice straw, one of the way was recycling it into paper. This study was to determine the effect of the proportion of rice straw and used HVS paper on the physical quality of the paper.

This research was pre-experimental research with After Only Design. The proportion of rice straw and used HVS paper was divided into two consisting of a ratio of 1:4 and 2:3. Each treatment was repeated 3 times. There was a control group that had been using only used HVS paper. The analysis of normally distributed data was carried out using the One Way Anova Test and the Kruskal Wallis Test for non-normally distributed data. A follow-up test was carried out if the results of the previous test stated that there was a difference.

The paper from the research results shows the characteristics of being thicker, greater grammage value, lower tensile strength and higher brightness compared to paper bags on the market. Based on the results of statistical tests it was stated that there were differences in the tensile strength and brightness of the paper between groups P1 (1:4), P2 (2:3) and control ( $p = 0,025 < \alpha (0,05)$  and  $p = 0,027 < \alpha (0,05)$ ). There was no difference in paper thickness and grammage between the P1 (1:4), P2 (2:3) and control groups ( $p = 0,057 > \alpha (0,05)$  and  $p = 0,446 > \alpha (0,05)$ ).

The paper which that had best physical quality was paper in treatment 2 (proportion of rice straw and used HVS 2:3) with a thickness value of 529,6  $\mu\text{m}$ , grammage of 166.6  $\text{g}/\text{m}^2$ , tensile strength of 2,29  $\text{kN}/\text{m}$  and brightness of 57,26%. Paper in treatment 2 (proportion of rice straw and used HVS paper 2:3) can be used as a paper bag with a lighter load because it had a tensile strength that approaches type C paper bags on the market of 2,98  $\text{kN}/\text{m}$ . Further research needed to be carried out with other proportions, cooking and soaking used HVS paper for a longer time and adding PVAc glue so that the tensile strength becomes better.

**Keywords:** Rice straw, used HVS paper, physical quality of paper

# PROPORSI JERAMI PADI DAN KERTAS HVS BEKAS TERHADAP KUALITAS FISIK KERTAS

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## ABSTRAK

Pengolahan jerami padi melalui pembakaran menyebabkan timbulnya pencemaran udara dan menghasilkan emisi gas rumah kaca. Perlu adanya inovasi pemanfaatan jerami padi salah satunya dengan mendaur ulang menjadi kertas. Penelitian ini bertujuan untuk mengetahui pengaruh proporsi jerami padi dan kertas HVS bekas terhadap kualitas fisik kertas.

Penelitian ini termasuk penelitian pra-eksperimental dengan rancangan *After Only Design*. Proporsi jerami padi dan kertas HVS bekas dibedakan menjadi dua terdiri dari perbandingan 1:4 dan 2:3. Setiap perlakuan diulang sebanyak 3 ulangan. Terdapat kelompok kontrol yang menggunakan bahan kertas HVS bekas saja. Analisis data berdistribusi normal dilakukan dengan Uji *One Way Anova* serta Uji *Kruskal Wallis* untuk data tidak berdistribusi normal. Dilakukan Uji lanjutan jika hasil pengujian sebelumnya dinyatakan terdapat perbedaan.

Kertas hasil penelitian menunjukkan karakteristik yang lebih tebal, nilai gramatur yang lebih besar, ketahanan tarik lebih rendah dan kecerahan yang lebih tinggi dibandingkan dengan *paper bag* di pasaran. Berdasarkan hasil uji statistik dinyatakan bahwa terdapat perbedaan rata-rata ketahanan tarik dan derajat cerah kertas antara kelompok P1 (1:4), P2 (2:3) dan kontrol ( $p = 0,025 < \alpha (0,05)$  dan  $p = 0,027 < \alpha (0,05)$ ). Tidak terdapat perbedaan rata-rata ketebalan dan gramatur kertas antara kelompok P1 (1:4), P2 (2:3) dan kontrol ( $p = 0,057 > \alpha (0,05)$  dan  $p = 0,446 > \alpha (0,05)$ ).

Kertas yang memiliki kualitas fisik terbaik yaitu kertas pada perlakuan 2 (proporsi jerami padi dan HVS bekas 2:3) dengan nilai ketebalan 529,6  $\mu\text{m}$ , gramatur 166,6  $\text{g/m}^2$ , ketahanan tarik 2,29  $\text{kN/m}$  dan derajat cerah 57,26%. Kertas perlakuan 2 (proporsi jerami padi dan kertas HVS bekas 2:3) bisa dijadikan sebagai *paper bag* dengan pemberian beban yang lebih ringan karena memiliki ketahanan tarik yang mendekati *paper bag* di pasaran sebesar 2,98  $\text{kN/m}$ . Perlu dilakukan penelitian lanjutan dengan perlakuan proporsi yang lain, perlu pemasakan dan perendaman kertas HVS bekas dalam waktu yang lebih lama serta penambahan perekat PVAc agar ketahanan tarik menjadi lebih baik.

**Kata Kunci :** Jerami padi, kertas HVS bekas, kualitas fisik kertas