

POTENSI FESES SAPI DAN FESES KERBAU SEBAGAI BAHAN BAKU PEMBUATAN PULP KERTAS

Cahyadi Tri Putra
07/253203/PT/05293

Intisari

Kerbau memiliki kemampuan lebih baik dibandingkan sapi dalam mencerna serat kasar akan menghasilkan feses dengan kadar serat lebih lembut dibandingkan dengan feses sapi. Kertas adalah lembaran berbahan dasar selulosa. Selulosa didapatkan dari bahan nabati berserat melalui proses pembuatan pulp, termasuk feses sapi dan kerbau. Penelitian ini bertujuan untuk mengetahui rendemen pulp dan kekuatan sifat fisik lembaran pulp dari feses sapi, feses kerbau, dan campuran keduanya yang dibandingkan dengan pulp kertas dari jerami padi dan standar mutu SNI. Proses pembuatan pulp yang digunakan adalah proses soda dengan larutan pemasak NaOH 5%, suhu pemasakan 100°C selama tiga jam dalam ketel terbuka. Data rendemen pulp dan data kekuatan sifat fisik lembaran pulp dianalisa dengan metode Rancangan Acak Lengkap (pola searah), bila terdapat perbedaan nyata akan dilanjutkan dengan uji Duncan. Hasil penelitian menunjukkan panjang serat feses sapi 0,39 – 1,21 mm dan diameter serat feses sapi 7,80 – 13,40 μm , panjang serat feses kerbau 0,37 – 1,25 mm dan diameter serat feses kerbau 7,40 – 13,80 μm . Rendemen pulp feses sapi $38,48 \pm 2,40\%$, feses kerbau $32,80 \pm 3,31\%$, dan campuran keduanya $32,76 \pm 3,76\%$. Indeks tarik lembaran pulp feses sapi $19,43 \pm 1,07 \text{ Nm/g}$, feses kerbau $25,22 \pm 5,14 \text{ Nm/g}$, dan campuran keduanya $20,00 \pm 2,14 \text{ Nm/g}$. Indeks retak lembaran pulp feses sapi $1,00 \pm 0,04 \text{ kPa.m}^2/\text{g}$, feses kerbau $1,08 \pm 0,18 \text{ kPa.m}^2/\text{g}$, dan campuran keduanya $1,18 \pm 0,11 \text{ kPa.m}^2/\text{g}$. Indeks sobek lembaran pulp feses sapi $1,28 \pm 0,10 \text{ mN.m}^2/\text{g}$, feses kerbau $1,29 \pm 0,12 \text{ mN.m}^2/\text{g}$, dan campuran keduanya $1,41 \pm 0,07 \text{ mN.m}^2/\text{g}$. Tidak ada perbedaan nyata dari semua data yang ada. Disimpulkan bahwa feses sapi dan feses kerbau dapat digunakan sebagai bahan baku pembuatan pulp kertas namun kekuatan sifat fisiknya di bawah standar mutu SNI.

Kata kunci: feses sapi, feses kerbau, pulp, kertas.

POTENTIAL BUFFALO FESES AND COW FESES AS RAW MATERIALS MAKING PAPER PULP

Cahyadi Tri Putra
07/253203/PT/05293

Abstract

Buffalo has a better ability than cow in digesting crude fiber and will produce a softer fiber feces content compared with cow feces. Paper is sheet made from cellulose. Cellulose can be obtained from a variety of fibrous materials through the pulping process, including feces of cattle and buffalo. This study aims to determine the pulp yield value and physical strength of the pulp sheet compared with rice straw paper pulp and SNI quality standard. Pulping used soda process with 5% concentration of NaOH solution cooker, 100°C cooking temperature for three hours in an open kettle. The datas of pulp yield value and pulp sheet physical strength was analyzed by One Way Completely Randomized Design method, if there are noticeable difference will be followed by Duncan test. The results showed that cow feces have fiber length was ranging from 0.39 – 1.21 mm and the diameter of the fiber was ranging from 7.80 – 13.40 μm , buffalo feces has a fiber length was ranging from 0.37 – 1.25 mm and the diameter of the fiber was ranging from 7.40 – 13.80 μm . The pulp yield value of cow feces was $38.48 \pm 2.40\%$, buffalo feces was $32.80 \pm 3.31\%$, and mixture of both feces was $32.76 \pm 3.76\%$. The tensile strength of cow pulp sheet feces was ranging from 19.43 ± 1.07 Nm/g, buffalo feces was ranging from 25.22 ± 5.14 Nm/g, and mixture of both feces was ranging from 20.00 ± 2.14 Nm/g. The bursting strength of cow pulp sheet feces was ranging from 1.00 ± 0.04 kPa.m²/g, buffalo feces was ranging from 1.08 ± 0.18 kPa.m²/g, and mixture of both feces was ranging from 1.18 ± 0.11 kPa.m²/g. The tear strength of cow pulp sheet feces was ranging from 1.28 ± 0.10 mN.m²/g, buffalo feces was ranging from 1.29 ± 0.12 mN.m²/g, and mixture of both feces was ranging from 1.41 ± 0.07 mN.m²/g. There was no influenced from all datas. The conclusion of the study of cow feces and buffalo feces can be used as raw material for making paper pulp, but the physical strength are still below the SNI quality standard.

Keywords: cow feces, buffalo feces, pulp, paper.