APLIKASI MIKROORGANISME LOKAL DARI AMPAS TEBU DAN LIMBAH IKAN TONGKOL PADA PENGOLAHAN SAMPAH DENGAN TEKNOLOGI OLAH SAMPAH DI SUMBERNYA (TOSS)

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ABSTRAK

Teknologi Olah Sampah di Sumbernya (TOSS) merupakan metode untuk mengolah sampah biomassa menjadi bahan bakar dalam bentuk pelet. Penelitian ini bertujuan untuk membandingkan hasil *biodrying* sampah daun dan ranting dengan penambahan mikroorganisme lokal (MOL) dari limbah ikan tongkol dan ampas tebu dengan bioaktivator AR124 meliputi parameter kadar air, temperatur, pH, bau, penyusutan serta lama *biodrying* dan membandingkan kualitas pelet biomassa berupa analisis proksimat dan nilai kalor dengan baku mutu SNI 8966:2021. Selain itu, dilakukan identifikasi bakteri yang terdapat pada MOL dan AR124. Penelitian dilakukan secara triplo dengan tiga variasi yaitu penambahan AR124, penambahan MOL, dan tanpa penambahan aktivator. Metode TOSS terdiri dari tiga tahapan yaitu pencacahan, *biodrying*, dan peletisasi. Sampah daun dan ranting dicacah, lalu dilakukan proses *biodrying* dengan bantuan MOL, selanjutnya dicetak menjadi pelet biomassa menggunakan mesin pelet dan dijemur 8 jam. Hasil pengujian saat proses *biodrying* menunjukkan penambahan MOL yang memiliki kadar air 13,67±3,51%, pH 7, penyusutan rata-rata 4 cm, dan lama *biodrying* selama 2-3 hari lebih baik daripada penambahan AR124 yang memiliki kadar air 14,00%, pH 7, penyusutan rata-rata 3,17 cm, dan lama *biodrying* selama 2 hari. Hasil pengujian pelet biomassa, semua variasi memenuhi baku mutu yang ditetapkan pada SNI 8966: 2021. Kandungan kadar air pelet biomassa berkisar antara 7,67±0,58 - 11,33±2,08%, kadar volatil 65±1,00 - 69,33±6,66%, kadar abu 13,00±3,61-13,67±4,93 %, *fixed carbon* 5,67±2,08 -14±5,29%, dan nilai kalor dalam rentang 2.821,97±268,09 - 3.512,17±298,95 kkal/kg. Hasil identifikasi mikroorganisme yang terdapat pada MOL dan AR124 adalah *Candida sp*. dan *Bacillus sp*.

***Kata Kunci**:* Ampas tebu, limbah ikan tongkol, mikroorganisme lokal, pelet biomassa teknologi olah sampah di sumbernya

ABSTRACT

On-Site Waste Processing Technology (TOSS) is a method for processing biomass waste into fuel in the form of pellets. This study aimed to compare the drying result of leaves and twig waste with the addition of local microorganisms (MOL) from tuna waste and bagasse with the AR124 bio activator, including parameters of moisture content, temperature, pH, odor, shrinking, and drying time; and to compare the quality of biomass through proximate analysis and calorific value with SNI 8966:2021 quality standard. In addition, the bacterial identification of bacteria found in MOL and AR124. The study was conducted in triplo with three variations: the addition of AR124, the addition of MOL, and without the addition of activators. The TOSS method consisted of three stages, which were shredding, drying, and pelletization. Leaves and twig waste were chopped, and then underwent the drying process with the help of MOL and molded into biomass pellets using a pellet machine and finally dried in the sun for 8 hours. Test results during the drying process showed that the addition of MOL which had a moisture content of 13.67 ± 3.51%, pH 7, average shrinking of 4 cm, and drying time of 2-3 days was better than the addition of AR124 which had a moisture content of 14.00%, pH 7, and average shrinking of 3.17 cm, and drying time of 2 days. Biomass pellet test results showed that all variations in the biomass pellets met the quality standards set out in SNI 8966: 2021. The moisture content of the biomass pellets ranged from 7.67 ± 0.58 -11.33 ± 2.08%; the volatile content was 65 ± 1.00 – 69.33±6.66%; ash content was 13.00±3.61-13.67±4.93%, fixed carbon was 5.67±2.08 -14±5.29%; and calorific value was in the range of 2,821.97±268.09 – 3,512.17±298.95 kcal/kg. Microorganisms identified in MOL and AR124 were Candida sp. and Bacillus sp.

***Keywords**: Bagasse, tuna waste, local microorganisms, biomass pellets, on-site solid waste processing technology*