

**PENGARUH LEVEL TAPIOKA DAN LAMA FERMENTASI
BUNGKIL KELAPA SAWIT DENGAN *Aspergillus niger*
TERHADAP KOMPOSISI KIMIA DAN PRODUKSI
GAS IN VITRO**

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Intisari

Penelitian ini bertujuan untuk mengetahui pengaruh level suplementasi tapioka dan lama fermentasi pada fermentasi bungkil kelapa sawit (BKS) menggunakan jamur *Aspergillus niger* (*A. niger*) pada komposisi kimia dan produksi gas. Sebanyak 100 g BKS disuplementasi dengan 0,00%, 0,25%, 0,50%, 1,00% tapioka dan 1,00% urea berdasar berat bahan keringnya, selanjutnya difermentasi dengan *A. niger* 0,50%. Fermentasi secara aerobik dilakukan pada suhu ruang selama 4 dan 8 hari dengan 3 replikasi tiap perlakuan. Variabel yang diamati meliputi kualitas fisik, pH, bahan kering (BK), bahan organik (BO), serat kasar (SK), dan produksi gas *in vitro*. Data dianalisis dengan pola faktorial 4x3. Kualitas fisik BKS yang difermentasi 4 dan 8 hari mempunyai karakter yang sama. Lama fermentasi dan penambahan tapioka tidak berpengaruh secara nyata pada kadar BK dan BO. Semakin lama waktu fermentasi maka nilai pH, total produksi gas turun tetapi kadar SK dan nilai fraksi c meningkat ($P < 0,01$). Nilai pH fermentasi BKS hari 4 dan 8 berturut-turut yaitu 7,43 dan 6,75. Kadar SK pada lama fermentasi 0, 4, dan 8 hari berturut-turut adalah 41,18%, 37,60%, 49,94%, total produksi gas adalah 26,18, 15,80, dan 14,89 ml/300g BK, nilai fraksi a adalah -2,18, -0,52, dan 0,20 ml/300g BK, nilai fraksi b adalah 31,99, 18,04, dan 15,77 ml/300g BK, nilai fraksi c adalah 0,046, 0,050, dan 0,067 ml/jam. Kadar SK pada level tapioka 0,00%, 0,25%, 0,50%, dan 1,00% berturut-turut adalah 43,82%, 44,00%, 40,72%, dan 43,06%, total produksi gas adalah 18,21, 17,86, 19,97, dan 19,79 ml/300g BK, nilai fraksi a adalah -1,19, -0,83, -0,89, dan -0,96 ml/300g BK, nilai fraksi b adalah 21,07, 20,61, 23,15, dan 22,89 ml/300g BK, nilai fraksi c adalah 0,058, 0,054, 0,052, dan 0,053 ml/jam. Kesimpulan penelitian ini adalah fermentasi BKS dengan *A. niger* dengan suplementasi tapioka dengan level 0,50% terjadi penurunan kadar SK tertinggi dan nilai kecernaannya paling tinggi. Lama fermentasi 4 hari menyebabkan penurunan SK, namun belum mampu meningkatkan nilai kecernaan BKS.

Kata kunci : Fermentasi, *Aspergillus niger*, Bungkil kelapa sawit, Lama fermentasi, Level tapioka

THE EFFECT OF TAPIOCA LEVEL AND INCUBATION TIME OF PALM FIBER FERMENTATION USING *Aspergillus* *niger* ON CHEMICAL COMPOSITION AND IN VITRO GAS PRODUCTION

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Abstract

This study was aimed to determine the effect of incubation time and tapioca supplementation level of fermentation of palm fibers (PF) using *Aspergillus niger* (*A. niger*) on chemical composition and gas production. A total of 100 g PF was supplemented with tapioca as much as 0.00%, 0.25%, 0.50%, 1.00%, and urea 1,00% based on dry matter, then they were inoculated with 0.50% *A. niger*. Fermentation was carried out in aerobic conditions at room temperature for 4 and 8 days with 3 replication each treatment. Parameter observed were physical qualities, pH, DM, OM, CF, and *in vitro* total gas production. Data were analyzed using 4x3 factorial design. Fermented PF at 4 and 8 days incubation had the same character. Fermentation time and tapioca supplementation did not affect significantly on CF and BO content. The longer fermentation time caused the pH value, total gas production value decreased, but increased CF and the c fraction value ($P < 0.01$). Days fermentation time had a highly significant effect on pH value. pH at 4 and 8 days incubation were 7.43 and 6.75 respectively. CF content of fermented PF at 0, 4, and 8 days incubation in a row were 41.18%, 37.60%, 49.94%, total gas production were 26.18, 15.80 and 14.89 ml/300g DM, the a fraction value were -2.18, -0.52, and 0.20 ml/300g DM, the b fraction value were 31.99, 18.04, and 15.77 ml/300g DM, the c fraction value were 0.046, 0.050 and 0.067 ml/hour. The higher levels of tapioca caused the greater of CF content ($P < 0.05$) and total gas production ($P < 0.05$), but decreased the c fraction ($P < 0.05$). CF content of fermented PF of tapioca levels of 0.00%, 0.25%, 0.50% and 1.00% were 43.82%, 44.00%, 40.72% and 43.06% respectively, total gas production were 18.21, 17.86, 19.97 and 19.79 ml/300g DM, the a fraction were -1.19, -0.83, -0.89, and -0.96 ml/300g DM, the b fraction were 21.07, 20.61, 23.15, and 22.89 ml/300g DM, and the c fraction were 0.058, 0.054, 0.052 and 0.053 ml/hour. Based on the results, it could be concluded that PF supplemented with tapioca at level 0,50% wick fermented using *A. Niger* greatest decreased CF content and increased digestibility. 4 days fermentation decreased CF content but did not improve the digestibility.

Keywords: Fermentation, *Aspergillus niger*, Palm fiber, Incubation time, Level of tapioca.