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

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INTISARI

Tujuan penelitian ini adalah untuk mengetahui komposisi kimia dan produksi gas bungkil kelapa sawit yang difermentasikan dengan *Aspergillus niger* pada lama inkubasi dan level penambahkan urea yang berbeda. Seratus gram bungkil kelapa sawit (BKS) difermentasi menggunkan *Aspergillus niger* sebanyak 0,5%, dengan dua perlakuan yaitu lama fermentasi (0 hari, 4 hari, dan 8 hari) dan penambahan urea (0%, 0,5%, 1%, 2%.). Penelitian ini menggunakan pola faktorial (3x4). BKS fermentasi (BKSF) kemudian dianalisis lebih lanjut, meliputi uji fisik, pH, komposisi kimia, dan produksi gas secara *in vitro*. Karakter fisik BKSF dengan lama inkubasi 4 hari terjadi perubahan warna menjadi coklat kehitaman, berbau sedikit amonia, bertekstur agak kasar dan tumbuh sedikit jamur, sedangkan BKSF dengan inkubasi 8 hari berwarna agak kehitaman, berbau agak asam, bertekstur agak kasar dan tumbuh sedikit jamur. Hasil penelitian lama fermentasi berpengaruh sangat signifikan ($P<0,01$) pada pH, BO, fraksi a+b, total produksi gas dan SK. Total volume produksi gas berturut-turut BKSF hari ke 0, 4, dan 8 adalah 20,46, 14,36, 11,68 ml/300g BK , sedangkan kadar SK berturut-turut 41,49%, 39,82%, 39,18% pada hari ke 0, 4 dan dan 8. Lama fermentasi tidak berpengaruh pada kadar BK, PK dan fraksi c. Level penabahan urea berpengaru signifikan ($P<0,01$) pada pH, BK, SK, PK, fraksi a+b dan produksi gas. Kadar SK BKSF dengan level urea 0%, 0,5%, 1%, 2 % adalah 39,50%, 39,40%, 41,93%, dan 38,82% , sedangkan kadar PK 6,37%, 7,59%, 7,15%, 9,04% dan total produksi gas 22,87, 10,92, 11,28, 16,93 ml/300g BK. Berdasar hasil penelitian dapat disimpulkan bahwa fermentasi BKS dengan *Aspergillus niger* dengan penambahan urea dapat meningkatkan kadar protein kasar. Fermentasi dapat menurunkan kadar serat kasar namun dengan penambahan urea belum dapat meningkatkan kecernaan.

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

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

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ABSTRACT

The aim of this study was to determine chemical compositions and gas production of fermented palm kernel meal using *Aspergillus niger* in different time of incubations and urea levels. One hundred grams of palm kernel meal (PKM) was fermented using *Aspergillus niger* (0.5%), consisted of two treatments: the incubation times of fermentation (0, 4, and 8 days) and the level of urea (0%, 0.5%, 1%, 2%.). This research was using factorial (3x4) design to analyse data. The analyzed traits of fermented PKM (PKMF) were physical test, pH, chemical composition, and in vitro gas production. At day 4 of incubation the PKMF physical character changed its color into brownies-black, had a bit of ammonia smell, had relatively rough-textured and a bit of fungi grew, and after 8 days of the incubation FPKM had a blackish color, smelled slightly acidic, quite rough-textured and a bit of fungi grew. The results indicated that the incubation time had significantly effect ($P<0.01$) on pH, organic matter, fraction a + b, total gas production and crude fiber contents., The gas production volumes were 20.46, 14.36, 11.68 ml/300g DM, respectively for 0, 4, and 8 days of incubatin., while Percentage of crude fiber respectively were 41.49%, 39.82%, and 39.18%.. Incubation time had non significant effect on DM, crude protein and fraction c. On the other hand, the level of urea influenced significantly ($P <0.01$) on pH, DM, crude fiber, crude protein, fraction a + b and gas production , Crude Fiber at urea level 0%, 0.5%, 1%, 2% on were respectively 39.50%, 39.40%, 41.93%, 38.82%, while crude protein were 6.37%, 7.59%, 7.15%, 9.04% and total gas production were 22.87, 10.92, 11.28, 16.93ml/300g DM. It can be concluded that addition of urea on PKM fermentation was increasing the crude protein content. Fermentation treatment reduced crude fiber content but the adition of urea in this fermentation did not increase digestibility.

Keywords: Fermentation, *Aspergillus niger*, *Palm kernel meal*, Incubation time, Urea level