OPTIMASI MEDIUM PRODUKSI PAKAN AYAM FERMENTASI DARI AMPAS KELAPA MENGGUNAKAN *Rhizopus arrhizus* UICC 11

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INTISARI

Konsumsi daging ayam di Indonesia terus mengalami peningkatan setiap tahunnya, sehingga diperlukan peningkatan produksi ayam untuk memenuhi kebutuhan masyarakat. Kebutuhan ini turut mendorong peningkatan biaya pakan ayam ras pedaging (*broiler*), sehingga diperlukan alternatif pakan yang ekonomis dan bernutrisi. Ampas kelapa merupakan limbah pertanian yang berpotensi digunakan sebagai bahan pakan alternatif karena mengandung nutrien seperti air (6,99%), protein (5,78%), lemak (38,23%), karbohidrat (33,64%), abu (0,26%), dan serat kasar (15,06%). Namun, kandungan protein kasarnya masih tergolong rendah sehingga perlu dilakukan optimasi melalui proses fermentasi menggunakan kapang *Rhizopus arrhizus*. Penelitian ini bertujuan untuk menentukan konsentrasi optimum glukosa, kadar air, dan *yeast extract* dalam medium fermentasi untuk meningkatkan kadar protein kasar pada ampas kelapa. Proses fermentasi dilakukan secara fermentasi padat menggunakan metode *Response Surface Methodology* (RSM) dengan model *Box-Behnken Design* (BBD) untuk mengkaji pengaruh interaksi antar variabel. Hasil penelitian menunjukkan bahwa *yeast extract* dan glukosa merupakan faktor dominan dalam peningkatan kadar protein kasar, sedangkan kadar air berperan dalam menciptakan lingkungan fermentasi yang optimal. Kondisi optimum pada kadar air 70%, glukosa 2 g/L, dan yeast extract 10 g/L, dengan prediksi kadar protein kasar 10,70% dan lemak 33,01%. Hasil validasi menunjukkan kadar protein kasar 9,45% ($p = 0,02$) dan lemak 25,20% ($p = 1,00$). Secara keseluruhan, model RSM tetap dinilai valid dan layak digunakan untuk optimasi medium fermentasi pakan ayam alternatif. Temuan ini menunjukkan bahwa fermentasi ampas kelapa dengan optimasi media menggunakan *Rhizopus arrhizus* dapat dijadikan solusi alternatif dalam penyediaan pakan ayam yang bernutrisi tinggi.

Kata kunci: ampas kelapa, *Rhizopus arrhizus*, fermentasi padat, protein kasar, optimasi medium.

OPTIMIZATION OF MEDIUM FOR FERMENTED CHICKEN FEED PRODUCTION FROM COCONUT PULP USING *Rhizopus arrhizus* UICC 11

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ABSTRACT

Chicken meat consumption in Indonesia continues to increase annually, necessitating greater poultry production to meet public demand. This growing demand has also contributed to the rising cost of broiler feed, prompting the need for alternative feed sources that are both economical and nutritious. Coconut meal, an agricultural by-product, has potential as an alternative feed ingredient due to its nutrient content, including water (6.99%), protein (5.78%), fat (38.23%), carbohydrates (33.64%), ash (0.26%), and crude fiber (15.06%). However, its crude protein content remains relatively low and thus requires optimization through fermentation using the fungus *Rhizopus arrhizus*. This study aimed to determine the optimal concentrations of glucose, moisture, and yeast extract in the fermentation medium to increase the crude protein content of coconut meal. The fermentation was conducted via solid-state fermentation using Response Surface Methodology (RSM) with the Box-Behnken Design (BBD) to evaluate the interaction effects among variables. The results showed that yeast extract and glucose were the dominant factors in enhancing crude protein content, while moisture played a role in creating an optimal fermentation environment. The optimum conditions were found at 70% moisture, 2 g/L glucose, and 10 g/L yeast extract, with predicted crude protein and fat contents of 10.70% and 33.01%, respectively. Validation results showed a crude protein content of 9.45% ($p = 0.02$) and fat content of 25.20% ($p = 1.00$). Overall, the RSM model was considered valid and reliable for optimizing the fermentation medium for alternative chicken feed. These findings suggest that optimized fermentation of coconut meal using *Rhizopus arrhizus* can serve as a promising solution for producing high-nutrient poultry feed.

Keywords: coconut pulp, *Rhizopus arrhizus*, solid-state fermentation, crude protein, medium optimization