Evaluasi dua metode ekstraksi asam amino dari limbah lumpur aktif = Evaluation of two methods for amino acids extraction from wastewater activated sludge / Annisa Azhari

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Abstrak

[ABSTRAK
Protein biomassa mikroba diharapkan menjadi sumber protein tambahan besar selama krisis pangan Limbah lumpur aktif telah dilaporkan mengandung nutrisi penting dan potensial sebagai pengganti protein non konvensional Protein terdiri dari asam amino dengan mengetahui cara efisien mengekstrak asam amino dari limbah lumpur aktif sangat penting untuk meningkatkan pemahaman produksi protein intraseluler dari air limbah Terdapat tiga metode yang diusulkan untuk mengevaluasi ekstrak asam amino dan asam amino bebas dari dua sumber lumpur limbah sintetis dan asli Metode 1 menggunakan ultrasonication untuk solubilisasi dan 32 wt HCl untuk 16 jam hidrolisis Metode 2 dibedakan menjadi dua metode solubilisasi a Alkali ultrasonication dan b Hanya alkali dilanjutkan dengan 6N HCl untuk 24 jam hidrolisis Metode 1 menghasilkan sedikit lebih tinggi dari ekstraksi total asam amino dengan total konten asam amino g g MLVSS 28 6 dan 24 0 dibandingkan dengan Metode 2a dengan 29 3 dan 21 6 untuk limbah sintetis dan limbah asli masing masingnya Secara signifikan Metode 2b memberikan hasil terendah dengan 11 6 pada limbah asli Dalam kesimpulan umum untuk skala limbah asli Metode 1 memberikan hasil yang terbaik untuk ekstraksi asam amino.
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ABSTRACT
Microbial biomass protein is expected to be the major supplementary protein source during the food crisis. Waste activated sludge (WAS) has been reported to contain important nutrients and is potential as non-conventional protein substitutes. Proteins are composed of amino acids, by knowing how to efficiently extract amino acids from WAS is crucial to improve the understanding of intracellular protein production from wastewater. Three methods were proposed to evaluate the amino acids and free amino acids extraction from two sludge sources; lab and full-scale sludge. Method 1 utilised ultrasonication for solubilisation and 32 wt% HCl for 16h hydrolysis. Method 2 differentiate to two solubilisation methods; a). Alkaline + ultrasonication and b). Alkaline only, followed by 24h hydrolysis with 6N HCl. Method 1 gave slightly higher result of total amino acids extraction with a total amino acids content (g/g MLVSS) 28.6% and 24.0% compared to Method 2a with 29.3% and 21.6%, for lab scale and full scale sludge, respectively. Significantly, Method 2b gave lowest result with 11.6% in full scale sludge. In general conclusion for full scale sludge, Method 1 gave the best result for amino acids extraction.; Microbial biomass protein is expected to be the major supplementary protein source during the food crisis. Waste activated sludge (WAS) has been reported to contain important nutrients and is potential as non-conventional protein substitutes.

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