ABSTRAK

ANALISIS KUALITAS AIR LIMBAH KEGIATAN DAPUR DI SATUAN PELAYANAN PEMENUHAN GIZI SETELAH PENGOLAHAN DENGAN MENGGUNAKAN HIDROGEN PEROKSIDA DAN MEMBRAN MIKROFILTRASI

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Abstrak

Air limbah dari kegiatan dapur Satuan Pelayanan Pemenuhan Gizi (SPPG) berpotensi mengandung berbagai bahan pencemar yang dapat menurunkan kualitas lingkungan apabila dibuang tanpa pengolahan yang memadai. Penelitian ini bertujuan untuk mengetahui karakteristik awal air limbah kegiatan dapur SPPG, menganalisis pengaruh kombinasi metode *Advanced Oxidation Processes* (AOPs) menggunakan hidrogen peroksida (H_2O_2) 30% dan membran mikrofiltrasi terhadap penurunan parameter *Chemical Oxygen Demand* (COD), *Total Suspended Solids* (TSS), amonia, dan sisa klorin, serta menentukan efisiensi penurunan pada variasi waktu kontak 30, 60, dan 90 menit. Penelitian menggunakan metode eksperimen skala laboratorium dengan analisis deskriptif kuantitatif. Hasil penelitian menunjukkan bahwa proses pengolahan mampu menurunkan konsentrasi parameter pencemar. Efisiensi penurunan COD pada waktu kontak 30, 60, dan 90 menit masing-masing sebesar 28,7%, 73,5%, dan 89,5%. Efisiensi penurunan TSS sebesar 71,2%, 90,7%, dan 98,6%, sedangkan efisiensi penurunan amonia sebesar 70%, 80%, dan 90%. Efisiensi penurunan sisa klorin masing-masing sebesar 11,6%, 19%, dan 93,9%. Waktu kontak 90 menit menghasilkan efisiensi penurunan tertinggi pada seluruh parameter yang diuji. Dengan demikian, kombinasi AOPs menggunakan H_2O_2 30% dan membran mikrofiltrasi berpotensi digunakan sebagai alternatif pengolahan air limbah kegiatan dapur SPPG.

Kata kunci: Air limbah SPPG, *Advanced Oxidation Processes*, hidrogen peroksida, membran mikrofiltrasi, waktu kontak.

ABSTRACT

ANALYSIS OF WASTEWATER QUALITY FROM KITCHEN OPERATIONS AT A NUTRITIONAL SUPPORT SERVICE UNIT FOLLOWING TREATMENT WITH HYDROGEN PEROXIDE AND MICROFILTRATION MEMBRANES

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Abstract

Wastewater generated from kitchen activities at the Nutrition Fulfillment Service Unit (Satuan Pelayanan Pemenuhan Gizi/SPPG) has the potential to contain various pollutants that may degrade environmental quality if discharged without adequate treatment. This study aimed to determine the initial characteristics of wastewater generated from SPPG kitchen activities, analyze the effect of combining Advanced Oxidation Processes (AOPs) using 30% hydrogen peroxide (H_2O_2) with a microfiltration membrane on reducing Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), ammonia, and residual chlorine, and determine the removal efficiency at contact times of 30, 60, and 90 minutes. This study employed a laboratory-scale experimental method with a quantitative descriptive analysis. The results showed that the treatment process reduced the concentrations of the tested pollutant parameters. The COD removal efficiencies at contact times of 30, 60, and 90 minutes were 28.7%, 73.5%, and 89.5%, respectively. The TSS removal efficiencies were 71.2%, 90.7%, and 98.6%, while ammonia removal efficiencies were 70%, 80%, and 90%, respectively. The residual chlorine removal efficiencies were 11.6%, 19%, and 93.9%, respectively. A contact time of 90 minutes resulted in the highest removal efficiency for all tested parameters. Therefore, the combination of AOPs using 30% H_2O_2 and a microfiltration membrane has the potential to serve as an alternative treatment method for wastewater generated from SPPG kitchen activities.

Keywords: SPPG wastewater, Advanced Oxidation Processes, hydrogen peroxide, microfiltration membrane, contact time.