ABSTRAK

Limbah cair RPA dihasilkan dari air bekas pencucian ayam yang didalamnya tercampur sisa pemotongan dan pembersihan isi perut. Limbah RPA mengandung senyawa organik yang tinggi dengan kandungan senyawa nitrogen (N) yang terdapat dalam protein daging ayam. Maka dari itu perlu dilakukan pengolahan limbah cair sebelum dibuang ke badan perairan supaya tidak memberi dampak negatif terhadap lingkungan. Salah satu cara yang dapat dilakukan dalam mengatasi pencemaran akibat pembuangan limbah cair RPA yaitu menggunakan metode MSL. Penelitian ini bertujuan untuk mengetahui penggunaan sistem MSL dalam menurunkan kadar amonia, nitrit, dan nitrat, mengetahui pengaruh kecepatan pengisian dan aerasi, serta untuk menentukan efisiensi sistem MSL. Air limbah dialirkan ke dalam sistem MSL dengan variasi kecepatan pengisian 160, 320, 480, 640, 800 $Lm^{-2}h^{-1}$ dan diperoleh kecepatan pengisian optimum pada 320 $Lm^{-2}h^{-1}$ dengan persentase penurunan kadar amonia, nitrit, dan nitrat sebesar 97,28%, 83,89%, dan 86,12%. Sistem MSL diberikan aerasi dengan variasi aerasi 0, 2, 4, dan 6 L/menit pada kecepatan pengisian optimum 320 $Lm^{-2}h^{-1}$, diperoleh aerasi maksimum pada aerasi 6 L/menit dengan persentase penurunan kadar amonia, nitrit, dan nitrat sebesar 98,23%, 89,07%, dan 83,87%. Efisiensi sistem MSL dalam menurunkan kadar amonia, nitrit, dan nitrat limbah RPA selama 40 hari pada kecepatan pengisian dan aerasi maksimum diperoleh masing-masing sebesar 97,78%, 88,07%, dan 86,12%. Hasil penelitian metode MSL dapat digunakan sebagai metode alternatif yang efisien dalam menurunkan kadar amonia, nitrit, dan nitrat limbah RPA.

Kata Kunci: *Multi Soil Layering* (MSL), Amonia, Limbah Cair RPA, Nitrit, Nitrat

ABSTRACT

RPA wastewater is generated from the water used to wash chickens, which is mixed with the remaining slaughtering and cleaning of entrails. RPA wastewater contains high organic compounds with nitrogen (N) compounds contained in chicken meat protein. Therefore, it is necessary to treat liquid waste before discharging it into water bodies so that it does not have a negative impact on the surrounding population. One of the ways that can be done in overcoming pollution due to RPA wastwater disposal is using the MSL method. This study aims to determine the use of the MSL system in reducing ammonia, nitrite, and nitrate levels, determine the effect of filling speed and aeration, and to determine the efficiency of the MSL system. Wastewater was flowed into the MSL system with variations of filling speed of 160, 320, 480, 640, 800 $Lm^{-2}h^{-1}$ and obtained an optimum filling speed at 320 $Lm^{-2}h^{-1}$ with a percentage reduction in ammonia, nitrite, and nitrate levels were 97,28%, 83,89%, dan 86,12%. The MSL system was aerated with aeration variations of 0, 2, 4, and 6 L/min at the optimum filling speed of 320 $Lm^{-2}h^{-1}$, obtained the maximum aeration at 6 L/min aeration with a percentage reduction in ammonia, nitrite, and nitrate levels were 98,23%, 89,07%, dan 83,87%. The efficiency of the MSL system in reducing ammonia, nitrite, and nitrate levels of RPA waste for 40 days at the optimum filling speed and maximum aeration were 97,78%, 88,07%, and 86,12%. This data showed that the MSL method can be used as an efficient alternative method in reducing ammonia, nitrite, and nitrate levels of RPA wastewater.

***Keywords**: Multi Soil Layering (MSL), Ammonia, RPA wastewater, Nitrite, Nitrate*