Malays. Appl. Biol. (2005) 34(2): 75–82

COMPARISON OF MODERN AND TRADITIONAL PIG WASTEWATER TREATMENT IN SERIAN, SARAWAK

AINON, H.[1*], MOHD-JEFRIN, A. A.[2] and LING T. Y.[3]

[1]*School of Biosciences and Biotechnology, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangî, Selangor.*
E-mail: antara@pkrisc.cc.ukm.my

[2]*Natural Resources and Environmental Board, Kuching, Sarawak*

[3]*Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak.*

ABSTRACT

Pig farming is an important industry in Sarawak. Efforts have been made by pig farmers to treat pig wastewater by installation of oxidation ponds. However, little information is available on the effectiveness of the ponds installed. In this study, wastewater quality was investigated in two pig farms in Serian, Sarawak. Farms selected were a farm with 8,000 standing pig population (SPP) uses multiple pond system (TB farm) and another farm with 800 SPP use only one pond system (HB farm). The oxidation ponds of TB farm reduced TSS, BOD_5, COD, and NH_3-N by 54%, 39%, 35% and 56%, respectively, whereas in HB farm reductions were 29%, 15%, 10% and 9%, respectively. DO concentrations for TB farm and HB farm increased 40% and 13%, respectively. Nitrate was reduced at 65% in the water samples of TB farm but there was an increase of 11% in the HB farm effluent. Even though TB farm has ten times more SPP than HB farms, the final discharge from TB farm was of significantly better water quality than that of HB farm. It is recommended that at least three ponds of appropriate size with separator be installed for the treatment of pig farm wastewater before being discharged into the river.

ABSTRAK

Penternakan babi adalah satu industri yang penting di Sarawak. Pelbagai usaha telah dijalankan oleh penternak babi untuk merawat air buangan dari kandang babi ini seperti membina kolam pengoksidaan. Terdapat kurang maklumat tentang keberkesanan kolam-kolam yang dibina. Dalam kajian ini, kualiti air buangan dari dua buah ladang penternakan babi di daerah Serian, Sarawak dibandingkan. Ladang yang dipilih adalah ladang yang mempunyai 8,000 populasi berdiri babi (PBB) yang menggunakan sistem banyak kolam (ladang TB) manakala satu lagi ladang Ladang mempunyai 800 PBB dan menggunakan sistem satu kolam sahaja (ladang HB). Kolam pengoksidaan ladang TB menurunkan kandungan efluen TSS, BOD_5, COD, dan NH_3-N masing-masing sebanyak 54%, 39%, 35% dan 56%, manakala ladang HB menurunkan masing-masing sebanyak 29%, 15%, 10% and 9%. Kepekatan DO dari ladang TB dan HB masing-masing meningkat 40% dan 13%. Nilai nitrat menurun ke 65% pada air sampel daripada ladang TB tetapi meningkat ke 11% di ladang HB. Walaupun ladang TB mempunyai sepuluh kali ganda PBB daripada ladang HB, namun hasil akhir yang dikeluarkan mempunyai kualiti air yang lebih baik daripada ladang HB. Oleh itu dicadangkan sekurang-kurangnya pembinaan tiga buah kolam berasingan dengan saiz yang tertentu digunakan dalam rawatan air buangan dari kandang babi sebelum air dikeluarkan ke sungai.

Key words: pig wastewater, oxidation pond, water quality, Sarawak

INTRODUCTION

During the last 20 years, the livestock industry experienced an exponential growth resulting in integrated large intensive animal farming units that created the need for laws and regulations to control animal waste pollution and minimize the environmental impact of the associated malodors. Pollution from pig, cattle, and poultry farms has become one of the most challenging

* To whom correspondence should be addressed.