

INTISARI

PENGARUH FREKUENSI PENCUCIAN FILTER MEKANIS PADA SISTEM RESIRKULASI TERHADAP KINERJA PERTUMBUHAN DAN EFISIENSI BUDI DAYA IKAN NILA MERAH (*Oreochromis sp.*)

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Penelitian ini bertujuan untuk menganalisis pengaruh frekuensi pencucian filter mekanis pada sistem resirkulasi terhadap kinerja pertumbuhan dan efisiensi budi daya ikan nila merah (*Oreochromis sp.*). Penelitian dilaksanakan selama 60 hari di *Teaching Farm* Departemen Perikanan, Fakultas Pertanian, Universitas Gadjah Mada menggunakan Rancangan Acak Lengkap (RAL) dengan empat perlakuan dan tiga ulangan. Perlakuan terdiri atas sistem budi daya resirkulasi tanpa pencucian filter mekanis (M0), pencucian filter setiap 7 hari (M7), pencucian filter setiap 28 hari (M28), dan kontrol berupa pergantian air 10% per hari (K). Parameter yang diamati meliputi sintasan, pertumbuhan, produksi biomassa, efisiensi pakan, faktor kondisi, kualitas air, serta efisiensi penggunaan air, energi listrik, dan biaya operasional. Data dianalisis menggunakan uji ANOVA atau Kruskal–Wallis sesuai karakteristik data. Hasil penelitian menunjukkan bahwa frekuensi pencucian filter mekanis tidak berpengaruh nyata ($P>0,05$) terhadap sintasan, pertumbuhan, efisiensi pakan, faktor kondisi, dan sebagian besar parameter kualitas air. Produksi biomassa berbeda nyata antarperlakuan ($P<0,05$), dengan perlakuan kontrol menghasilkan biomassa tertinggi, tetapi tidak berbeda nyata dengan perlakuan pencucian filter setiap 28 hari. Dari aspek efisiensi budi daya, sistem budi daya resirkulasi mampu menurunkan penggunaan air, konsumsi energi listrik, dan biaya operasional dibandingkan sistem kontrol. Perlakuan tanpa pencucian filter mekanis menunjukkan efisiensi penggunaan air terbaik, sedangkan pencucian filter setiap 28 hari memberikan keseimbangan terbaik antara performa budi daya dan efisiensi penggunaan sumber daya. Dengan demikian, pencucian filter mekanis hingga interval 28 hari masih dapat diterapkan tanpa menurunkan performa budi daya ikan nila merah pada sistem yang digunakan.

Kata Kunci: ikan nila merah, RAS, filter mekanis, frekuensi pencucian filter, kinerja pertumbuhan, efisiensi budi daya.

ABSTRACT
THE EFFECT OF MECHANICAL FILTER CLEANING FREQUENCY IN
A RECIRCULATING AQUACULTURE SYSTEM ON THE GROWTH
PERFORMANCE AND CULTURE EFFICIENCY OF RED TILAPIA
(*Oreochromis sp.*)

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This study aimed to analyze the effect of mechanical filter cleaning frequency in a Recirculating Aquaculture System (RAS) on the growth performance and culture efficiency of red tilapia (*Oreochromis sp.*). The experiment was conducted for 60 days at the Teaching Farm, Department of Fisheries, Faculty of Agriculture, Universitas Gadjah Mada, using a Completely Randomized Design (CRD) with four treatments and three replicates. The treatments consisted of a RAS without mechanical filter cleaning (M0), mechanical filter cleaning every 7 days (M7), every 28 days (M28), and a control with a 10% daily water exchange (K). The observed parameters included survival rate, growth performance, biomass production, feed utilization efficiency, condition factor, water quality, water use efficiency, electrical energy efficiency, and operational cost efficiency. Data were analyzed using one-way ANOVA or the Kruskal–Wallis test according to the characteristics of the data. The results showed that mechanical filter cleaning frequency had no significant effect ($P>0.05$) on survival rate, growth performance, feed utilization efficiency, condition factor, or most water quality parameters. Biomass production differed significantly among treatments ($P<0.05$), with the control treatment producing the highest biomass, although it was not significantly different from the treatment with mechanical filter cleaning every 28 days. In terms of culture efficiency, the RAS reduced water consumption, electrical energy use, and operational costs compared with the control system. The treatment without mechanical filter cleaning showed the highest water use efficiency, whereas mechanical filter cleaning every 28 days provided the best balance between culture performance and resource-use efficiency. These findings indicate that mechanical filter cleaning at 28-day intervals can be applied in the RAS used in this study without reducing the culture performance of red tilapia.

Keywords: red tilapia, recirculating aquaculture system, mechanical filter, cleaning frequency, growth performance, culture efficiency.