USE OF BIOFLOC TECHNOLOGY IN INTENSIVE TILAPIA(*Orechromis niloticus*) AQUACULTURE

By

HANY SAID ALY SHALABY

B.Sc. Agric.Sci. (Animal Production), Ain Shams University, 2009

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ABSTRACT

Hani Said Ali Shalaby. The Use of Biofloc Technology in Intensive Tilapia (*Oreochromis Niloticus*) Culture. Unpublished M.Sc. thesis, Department of Animal Production, Faculty of Agriculture, Ain Shams University, 2015.

Application of bioflocs technology (BFT) in aquaculture offers a solution to water scarcity problems. Where BFT is the development and control of dense heterotrophic microbial flocs in the water column by adding carbon sources to fish culture pond. Hence, the objective of the present study is to evaluate the effects of three different carbon sources: molasses (T1), Vinasse (T2) and cornstarch (T3); on microbial activity, water quality parameters and growth performance of *Orechromis niloticus* in indoor biofloc tanks compared with that reared in a clear water with no carbon sources (T4). The present study was maintained for 112 day; the experimental tanks stoked with 64 fish / m^{-3} with average initial weight of 31.5 ± 0.431g and carbon sources were added at C/N ratio10: 1 in vinase, while in molasses and corn starch were 20:1.

The results demonstrated that vinasse had no significant differences on the growth parameters. However, vinasse enhanced nitrate concentration only compared to other measured water quality parameters. The addition of molasses and cornstarch had a significant reduction in concentrations of the total ammonium nitrogen, nitrite nitrogen and increased the total heterotrophic bacterial densities ($P<0.05$), respectively compared to control. The biofloc development in terms of Floc volume index (FVI) and total heterotrophic bacteria count were in favor of molasses tanks than corn starch tanks. parameters of growth performance of tilapia including net yield, specific growth rate (SGR), weight gain percentage, growth rate and feed conversion ratio demonstrated that, carbohydrate addition into

zero-water exchange systems for *O. niloticus* intensive culture can effectively improve water quality, bacterial activities and fish growth. which, eventually lead to a higher growth performance compared to that cultured under traditional systems.

Key Words: Biofloc technology, Zero water exchange, Heterotrophic bacteria, Carbohydrate addition, Total suspended solids, Floc volume index, C/N ratio, *Orechromis niloticus*.

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LIST OF ABBREVIATIONS

Symbol	Meaning
BFT	Biofloc technology
ZWEH	Zero water exchange system
AST	activated suspension technique
AMR	aerated microbial reuse systems
FVI	Floc volume index
TSS	Total suspended solids
VSS	Volatile suspended solids
THB	Total hetertrophic bacteria
RAS	Recirculating Aquaculture System
IHP	International Hydrological Program
SGR	Specific growth rate
FCR	Feed conversion ratio
mg	Milligram
µg	Microgram
NH3	Unionized ammonia
NH4	Ionized ammonia
NO2	Nitritre - Nitrogen
NO3	Nitrate - Nitrogen
PHB	poly-β-hydroxybutyrate
DO	Dissolved oxygen
°	Degree
C	Celsius
g	gram
HP	Horse power
PH	Hydrogen ion concentration
/	Per
-1	per
TAN	Total ammonium nitrogen
Kg	Kilogram
IU	International unit
h	Hour
mm	Milimicron
ml	Mililiter
CFU	colony forming units

L	Liter
PUFA	Poly unsaturatied fatty acid
HUFA	Highly unsaturatied fatty acid
PER	Protein Efficiency Ratio
NPUa	Net Protein Utilization
TWG	Total Weight Gain
CHO	Carbohydrate
SVI	Sludge volume indexdge