



Egyptian Journal of Aquatic Biology & Fisheries  
Zoology Department, Faculty of Science,  
Ain Shams University, Cairo, Egypt.  
ISSN 1110 – 6131  
Vol. 30(2): 2123 – 2135 (2026)  
www.ejabf.journals.ekb.eg



## Effect of Magnetically Treated Water on Feeding Efficiency and Growth Performance of Two Tilapia Species; *Oreochromis aureus* (Steindachner, 1864) and *Coptodon zilli* (Gervais, 1848), in a Closed Culture System

Amir A. Jabir, Kadhim H. Younis, Qusay H. Al-Hamadany, Ali T. Yaseen\*,  
Khalid W. Farnar, Faleh M. Mutlak, Layla A. Aufy

Department of Marine Vertebrates, Marine Science Center, University of Basrah, Basrah, Iraq

\*Corresponding Author: [ali.taha@uobasrah.edu.iq](mailto:ali.taha@uobasrah.edu.iq)

### ARTICLE INFO

#### Article History:

Received: Jan. 17, 2026

Accepted: March 14, 2026

Online: April 3, 2026

#### Keywords:

Magnetized water,  
Tilapia,  
Magnetic field,  
Growth performance,  
Feed efficiency,  
Survival,  
Aquaculture,  
Water quality

### ABSTRACT

Enhancing growth performance and feed efficiency remains a significant challenge in aquaculture systems, especially under intensive production conditions. As a result, alternative and environmentally sustainable techniques have attracted considerable interest. The present study assessed the effects of varying magnetic field intensities on selected environmental parameters, growth performance, feed utilization efficiency, and survival rates of tilapia (*Oreochromis aureus* and *Tilapia zillii*). Water temperature ranged from 21.3 to 27.2°C, which is within the optimal range for tilapia growth. Notably, pH values increased significantly in the 1500 and 3000 gauss treatments compared to the control, accompanied by a modest rise in dissolved oxygen concentration. Magnetized water treatment significantly influenced both weekly and daily growth rates in both species. The 3000 gauss treatment produced the highest final weight and specific growth rate, followed by the 1500 gauss treatment, while the control group exhibited the lowest values. Feed conversion ratio improved significantly in the 3000 gauss treatment for both *O. aureus* (2.96) and *T. zillii*, reflecting enhanced feed utilization efficiency. Feed intake also increased with higher magnetic field intensity. Survival rates reached 100% in the 3000 gauss treatment for both species. These results indicate that water magnetization at elevated magnetic field intensities can improve growth performance, feed efficiency, and survival in tilapia, underscoring its potential as a supportive technique in aquaculture systems.

### INTRODUCTION

Magnetization is a physical process that has received significant attention in aquaculture and fish farming research. As an emerging technology, magnetization offers potential benefits for improving production efficiency and promoting environmental sustainability (Ahmed & Zhang, 2023). The application of magnetic fields to water or feed modifies their physical and chemical properties, such as reducing surface tension and increasing solubility (Aladjadjiyan, 2012; El-Sayed *et al.*, 2022; Samarrai *et al.*, 2022). Saeb *et al.* (2021) investigated the effects of magnetized water and chemical

Indexed in



ELSEVIER DOAJ

IUCAT