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## ZOOTECHNICAL PERFORMANCE OF TILAPIA CULTIVATED IN CONDITIONS IN WHICH COMPOUNDS THAT STIMULATE THE ACTIVITY OF MICRO-ORGANISMS THAT REDUCE THE AMOUNT OF ORGANIC MATTER WERE APPLIED

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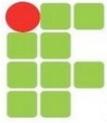
**ABSTRACT:** Tilapia are omnivorous, rustic fish that are capable of adapting easily to confinement in various levels of productive intensity. They can thereby tolerate low levels of dissolved oxygen and relatively high levels of ammonia when they are farmed in intensive systems. This study had the purpose of monitoring the zootechnical performance of tilapia that were farmed in breeding ponds whose water was dosed with a product consisting of inorganic nanoparticles that stimulate the activity of the micro-organisms that consume and reduce organic matter.

For this study, the Nile tilapia, or *Oreochromis niloticus*, were reared for a period of 183 days in breeding ponds that were filled with groundwater at the Agrícola Famosa farm, which is located in the municipality of Icapuí, in the state of Ceará, approximately 230 kilometres from the capital city of Fortaleza. The fish were then cultivated in the fingerling and growing-out stages for a period of 185 days. These GIFT (Genetically Improved Farmed Tilapia) were purchased from Fazenda Aquabel in the district of Icarai de Amontada, in the state of Ceará.

The fish were put into three plastic tarp lined breeding ponds (corresponding to three different levels of treatment). Each pond had a useful volume of 600 m<sup>3</sup>, but were filled with 500 m<sup>3</sup> of water, and had a stocking density of 13 fish/m<sup>3</sup>. Therefore, 6,500 fish received each level of treatment. The fish had initial average weights and average lengths of 20.3±0.4 g and 9.6±0.8 cm, respectively. They were fed at an initial daily rate of 6% of their biomass, eight times per day. The feeding was then reduced to a rate of 1.5% of their biomass, six times per day. The fish were fed with a nutritionally balanced, extruded aquafeed containing 35% and 32% raw protein, respectively, that was thrown directly onto the surface of the water.

During the cultivation of the animals, a product was added to the breeding ponds to aid in the reduction of the organic matter in the water. Known as *Biocelerator 500*®, this product is a colourless, aqueous solution of inorganic nanoparticles which was applied in Treatments 1 and 2 at dosages of 1 litre/week and 200mL/day, five days per week, respectively. Biomix Gel®, a bioremediator for use in reducing the amount of organic matter in water, was used as treatment agent 3 at a dosage of 60 g/week.

At the end of the experiment, a sample of various fish was collected with a net from each of the breeding ponds (each with their own level of the treatment design) in order to measure their final average weights, which were determined using a digital semi-analytical balance. The parameters survival rates, final biomass generated, average daily weight gain and apparent feed conversion ratio were also determined.



The authors also noted that the development of the fish was more robust in treatment ponds 1 and 2 where the Biocelerator 500® was applied, showing survival rates, final average weights, final biomasses, average daily weight gain and apparent feed conversion ratios of 99.11 and 99.42%; 784.4 and 747.0 g; 5,053.10 and 4,827.11 Kg; 4.24 and 4.04 g/day; and 1.35 and 1.45, respectively, which were all superior to those results associated with treatment 3 in which the Biomix Gel® was used.

The results for treatment 3 were the following: 98.97%; 739.1 g; 4,754.63 Kg; 4.00 g/day and 1.43, respectively (Table 1), which illustrated the efficiency of the enzyme in reducing the organic matter content of the water (Biocelerator 500®) in this intensive fish farming system.

Table 1. Survival rate (S), final average weight (W), final biomass (B), average daily weight gain (ADWG) and apparent feed conversion (AFC) of the fish at the end of the 185 days in which the fish were reared in ponds lined with plastic tarp while dosing two compounds that stimulate the micro-organisms that reduce organic matter concentrations in the water.

Treatment	S (%)	W (g)	B (Kg)	ADWG (g/day)	AFC
Biocelerator (1 L/week)	99,11	784,4	5053,10	4,24	1,35
Biocelerator (200 mL/day)	99,42	747,0	4827,11	4,04	1,45
Biomix (60 g/week)	98,97	739,1	4754,63	4,00	1,43

**KEYWORDS:** zootechnical performance, grow-out, organic matter, production, Nile tilapia.