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Effects of feeding frequency on the productive performance of different tilapia strains

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This study was conducted during 251 days from April 13th to December 20th in 2010, and it aimed the evaluation of zootechnical performance of three tilapia strains submitted to two feeding frequencies, fed twice a day (2x) and fed once a day (1x). The strains evaluated were: GIFT (G), Supreme (S) which has been improved by AQUABEL Fish Farming, and Chitralada (CL) obtained from a local producer established, for more than 10 years at the East region of São Paulo, Brazil. Fish were stocked into 18 fish cages with 4 m³ on a density of 117.5 fish per cage. The fish cages were installed into a rural reservoir with 6,598 m² located at Monte Alegre do Sul in São Paulo, Brazil. For the sampling set up it was adopted a 3 x 2 factorial with three replicates totally randomized, and consisted by six treatments (T): T1 – G 2x; T2 – G 1x –; T3 – S 2x; T4 – S 1x; T5 – CL 2x and T6 – CL 1x. The fish were fed daily with a commercial feed containing 32% of crude protein. During the first 15 minutes of the feeding procedure it was observed the consumption of feed by fish and also the amount of uneaten feed, which was weighted in order to have an estimative of the real valor of feed consumption. The physical and chemical parameters of water quality were checked every day with a multiparameter probe. The following average and standard deviation valor's were observed: water transparency, 47 cm ± 14.5; water temperature 20.43 °C ± 3.04; dissolved oxygen 4.79 mg L⁻¹ ± 1.37; and pH 6.7 ± 0.33. During the experimental period the following indexes of zootechnical performance were evaluated: weight gain (WG); apparent feed conversion rate (AFCR); survival (SURV %); specific growth rate (SGR); and final biomass (FB). In order to verify the possible interactions between the factors it was used Generalized Linear Models approach based on a PROC GLM routine of the SAS System. According to the main results obtained it is possible to affirm that apparent feed conversion rate AFCR is significantly affected by fish strain, but not by feeding frequency. The best results for AFCR were observed for CL strain (1.28) followed by G (1.53) which were not significantly different between themselves. However, the S strain (1.95) was significantly different to the others. The WG was influenced by feeding frequency, and it was also observed that fish fed twice a day (418.9 kg) presented results significant bigger related to weight gain for fish feed once a day (346.5 Kg). Survival (SURV %) was only affected by strains, and it was not observed a significant difference between the G and S strains, respectively, 82.2% e 82.7%, but it was observe a significant difference with C strain (72 %). For the SGR it was possible to conclude that only the feeding frequency has caused a significant effect for the treatments that fish were feed twice a day (0.69), which was significant bigger in comparison to the fish feed once a day (0.61). It was also verified that the final biomass (FB), what could be the major interest of the fish farmers by the end of the production cycle, was affected by the influence of factors, such as, strain and feeding frequency. The calculations realized to determine the confidence intervals for the averages of FB showed that it was significant bigger for the strains S (190.13 kg) and G (179.10 kg), which did not differ between them when they were compared to the CL strain (159.64 kg). Finally, in relation of feeding frequency with the FB obtained in the cages that fish were fed twice a day was significantly bigger (185.73 kg) in relation to the cages that the fish were fed once a day (166.73 kg).