NOTICE OF PUBLICATION

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Sustainable Aquaculture for a Secure Future

Title: Production, Growth, and Insulin-Like Growth Factor-I (IGF-I) Gene Expression as an Instantaneous Growth Indicator in Nile Tilapia *Oreochromis Niloticus*

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Abstract: Worldwide, rapid expansion of the market for *Oreochromis* spp. (tilapia) has increased the incentive for culturists to optimize the profitability of production techniques for these fishes. The establishment of best management practices for tilapia production has been slow, in part because they are omnivorous and relatively easy to grow. Their wide distribution in subtropical and tropical areas and the ease of adaptation to different culture methods have contributed to the highly variable approaches that are used to cultivate tilapia commercially. Ongoing refinement of the efficiency of tilapia culture in response to environmental, nutritional, and genetic variables is reliant on accurate assessment of growth rates. We describe herein a molecular method for the rapid assessment of the growth status of these fish. Earlier trials of culture conditions have been dependent on expensive commercial-scale production trials and labor-intensive physical measurements of growth, but expression of the insulin-like growth factor-I (IGF-I) gene provides a nearly instantaneous indicator of the growth status of these fishes. The relative accuracy and efficiency of quantifying the hepatic mRNA (messenger RNA) for this growth regulatory compound and its applicability as a growth indicator or marker in tilapia are discussed. We conclude that IGF-I mRNA abundance is suitable as an alternative approach to the assessment of growth during trials of the relative effectiveness of experimental culture conditions.

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