



***THE EFFECT OF DIFFERENT LEVELS OF VITAMIN E ON GROWTH AND SURVIVABILITY IN JUVENILE AFRICAN CATFISH, *Clarias gariepinus****

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SURVIVABILITY IN JUVENILE AFRICAN CATFISH, *Clarias gariepinus*.

BY

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It is hereby certified that I have read this project paper entitled “The effect of different levels of vitamin E on growth and survivability in juvenile African catfish, *Clarias gariepinus*”, by Seetha a/p Ramasamy and in my opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999 - Project.

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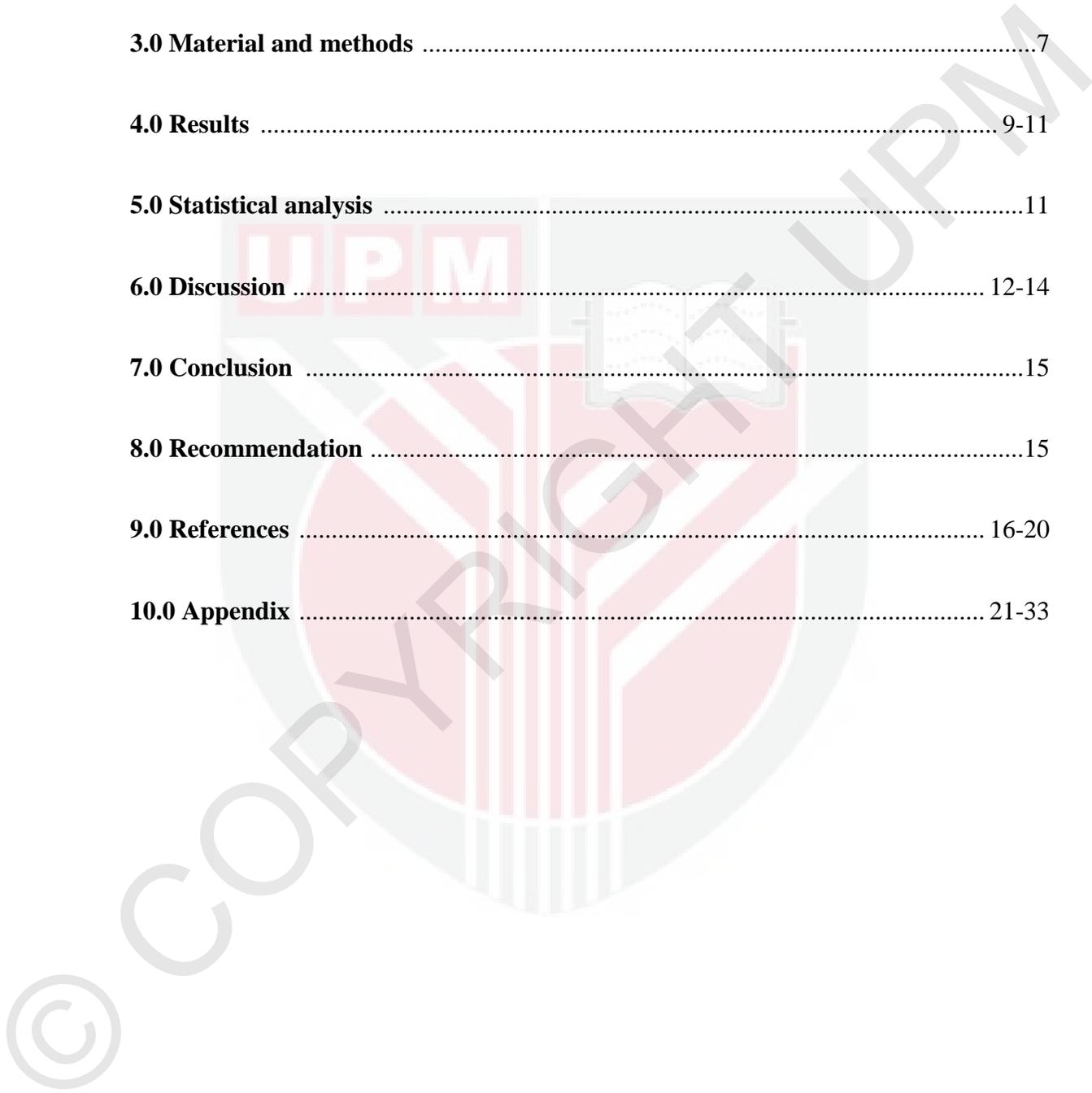
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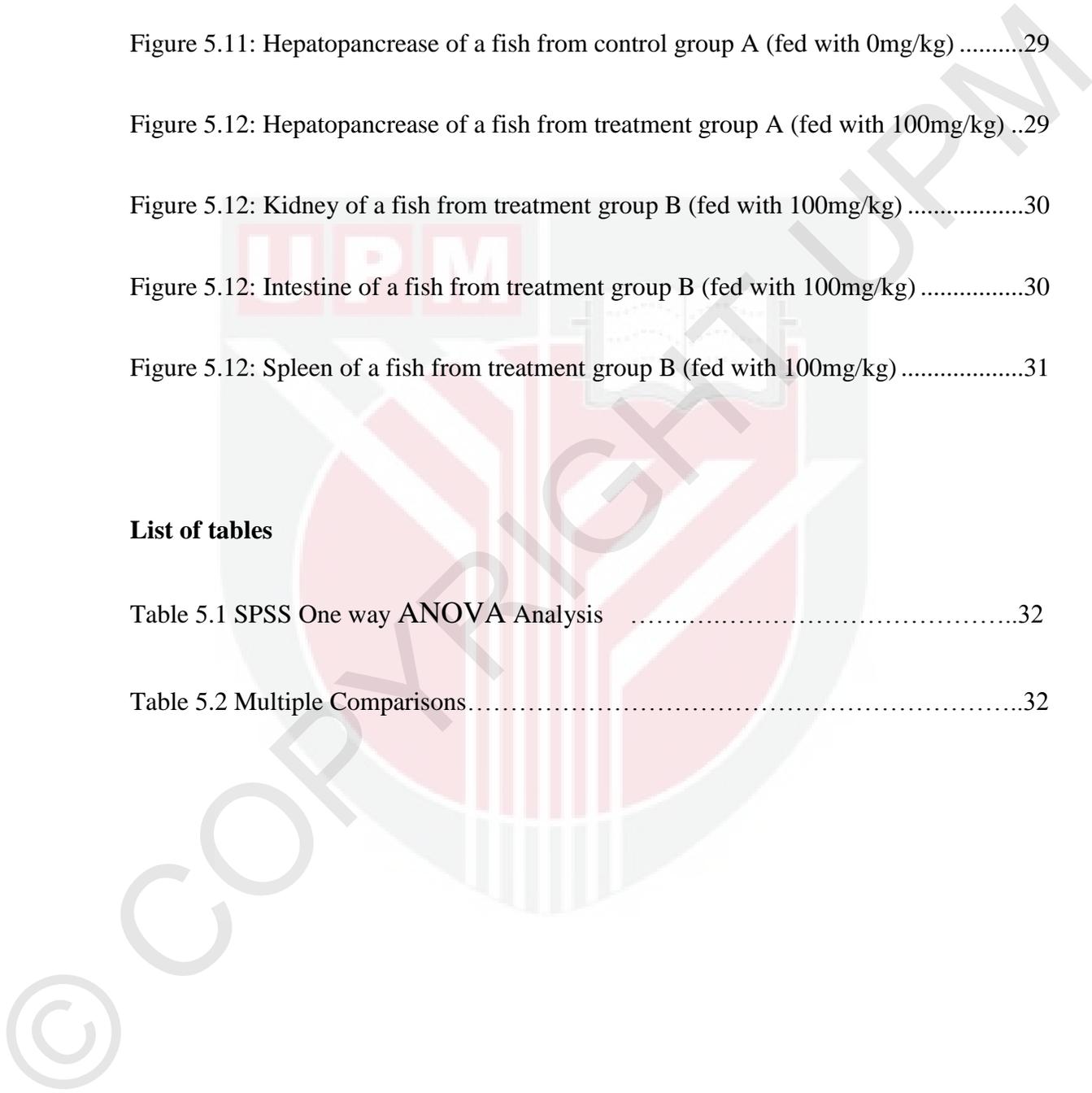
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**ABSTRAK**

Abstrak daripada kertas projek dikemukakan kepada Fakulti Perubatan Veterinar bagi memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek

**KESAN VITAMIN E KE ATAS IKAN KELI AFRIKA JUVENIL TERHADAP  
PERTUMBUHAN DAN KEMANDIRIAN, *Clarias gariepinus*.**

**DISEDIAKAN OLEH**

**SEETHA A/P RAMASAMY**

**MAC 2015**

**PENYELIA: PROF. MADYA DR. HASSAN HJ. MOHD DAUD**

Vitamin E merupakan salahsatu nutrien penting yang mempengaruhi sistem imunisasi ikan, mengurangkan kadar kematian dan meningkatkan prestasi ikan. Kajian ini mengkaji tentang kesan vitamin E ke atas ikan keli Afrika juvenil dari segi pertumbuhan

dan kemandirian. Lapan puluh keli juvenil secara rawak dibahagikan ke dalam lapan tangki (10 ekor / tangki ) dan diletakkan pada suhu bilik (25°C) dan pH 7. Ikan juvenil tersebut telah dibahagikan kepada dua kumpulan iaitu kumpulan A dan B. Kedua-dua kumpulan diberi vitamin E yang dimasukkan ke dalam pada dos yang berbeza (0 , 100 , 300 , 500 mg / kg ) dan berat badan dinilai dalam tempoh dua minggu . Kumpulan B telah dicabar dengan bakteria *Aeromonas hydrophila* ( $10^{15}$  cfu / ml) selepas dua minggu diberikan vitamin E dan kemandirian diperhatikan. Sampel tisu daripada kedua-dua kumpulan telah dihantar untuk histopathology. Dalam Kumpulan A, purata berat ikan menurun dengan peningkatan dos vitamin E. Manakala, dalam Kumpulan B diperhatikan bahawa kadar kematian lebih tinggi dalam kumpulan kawalan berbanding dengan kumpulan ikan yang diberi makan dengan vitamin E.

Kata kunci: *Clarias gariepinus*, vitamin E, pertumbuhan, kemandirian, *Aeromonas hydrophila*

**ABSTRACT**

An abstract of the project paper presented to Faculty of Veterinary Medicine in partial fulfillment of the course VPD 4999 – Project

**THE EFFECT OF DIFFERENT LEVELS OF VITAMIN E ON THE GROWTH  
AND SURVIVABILITY OF JUVENILE AFRICAN CATFISH,**

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BY

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**SUPERVISOR: ASSOC. PROF. DR. HASSAN HJ. MOHD DAUD**

Vitamin E is an important nutrient influencing fish immune system, reduce mortality and improve fish performance. In the current study, its effect on juvenile African catfish was evaluated by growth and survivability. Eighty juveniles were randomly

divided into eight tanks (10 tails/tank) and kept at room temperature (25°C) and pH 7. They were divided into two groups i.e. Group A and B. Both groups were fed with different level of vitamin E incorporated in feed (0, 100, 300, 500 mg/kg) and evaluated by their weight gain within two weeks. Group B was later challenged with *A. hydrophila* ( $10^{5.5}$  cfu/ml) after two weeks and their survivability was observed. Tissue samples from both groups were sent to histopathology. It was shown that in Group A, the average weight gain decreased with increasing dose of vitamin E. In Group B, it was observed that higher mortality was seen in the control group as compared to those fed with the vitamin.

Keywords: *Clarias gariepinus*, Vitamin E, Growth, Survivability, *Aeromonas hydrophila*.

## 1.0 Introduction

Aquaculture is emerging as one of the most viable and promising enterprises for keeping pace with the surging need for animal protein, providing nutritional and food security to humans, particularly those residing in regions where livestock is relatively scarce. With every step toward intensification of aquaculture practices, there is an increase in the stress level in the animal as well as the environment. With the increasing stress level, the cultivation of fishes remains high but more production is needed. In order to increase the production of fish, vitamin E was found to be an advantage when added in feed. Studies had shown that Vitamin E could positively manipulate growth and also survivability. According to Amlashi *et al.*, (2010), in diet supplemented with high vitamin E, increased survivability was observed. In contrast, according to Bai and Lee (1998), there was a negative growth effect in high vitamin E diets.

Vitamin E is a lipid-soluble vitamin that comprises eight naturally occurring tocopherols. Among them, d- $\alpha$ -tocopherol has the highest biopotency. Vitamin E functions as a metabolic antioxidant, preventing the oxidation of biological membranes and lipoproteins. It has been demonstrated to be an essential dietary nutrient for all fish studied. Many studies reported its optimum requirement in diets for many fish species. Several deficiency symptoms, such as erythrocyte fragility, anemia, muscular dystrophy and depigmentation have been induced in fish by vitamin E deficient diets (NRC, 1993).

The deficiency signs had been described for Atlantic salmon (Poston *et al.*, 1976), channel catfish (Lovell *et al.*, 1984), common carp (Roem *et al.*, 1990), rainbow trout (Cowey *et al.*, 1983), yellowtail (Toyoda, 1985) and Korean rockfish (Bai and Lee, 1998). The African catfish, *Clarias gariepinus* was used in the current study for many reasons, including the current availability of this species in almost all its water bodies and a huge increasing demand by the expanding population. Historically, *C. gariepinus* been used as ‘police-fish’ to control over-breeding in mixed-sex tilapia culture in earthen ponds. However, successful African catfish production in intensive systems is currently closely correlated with new formulation of feed where the more subtle effects of micronutrients like vitamin E need to be determined.

### 1.1 Justification

Few earlier studies have been done on the effect of different level of vitamin E on growth and survivability in juvenile African catfish, *C. gariepinus*. The studies suggested that the vitamin E was able to increase the growth of African catfishes with increasing dose of vitamin E (Amlashi *et al.*, 2011). While in other studies, it was shown that the high level of vitamin E diminished their growth (Bai and Lee, 1998). At the same time, the survivability of fishes fed with different level of vitamin E is still questionable. Thus, the current study will focus on the growth and survivability of *C. gariepinus* fed with diet incorporated with 0,100,300 and 500mg of vitamin E per kg body weight. The information that will be obtained from the current study will be useful for the aquaculture industry to increase the fish production whereby the demand keeps increasing day by day.

### 1.2 Objectives of study

The objectives of the study were as follows:

- i) To determine the effect of dietary Vitamin E on the growth(weight gain) of *C. gariepinus* juveniles.
- ii) To determine the survivability of *C. gariepinus* fed with different level of vitamin E after challenged with *A. hydrophila* bacteria.

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