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*In the name of Allah who is the Most  
Beneficial and Merciful.*

**HORMONAL MASCULINIZATION, GROWTH PERFORMANCE AND MEAT QUALITY IN NILE TILAPIA, *Oreochromis niloticus* BY ANDROGEN ADMINISTRATION AT DIFFERENT DIETARY PROTEIN LEVELS.**



By

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## DECLARATION

I hereby declare that contents of the thesis "**Hormonal Masculinization, growth performance and meat quality in Nile Tilapia, Oreochromis niloticus by androgen administration at different dietary protein levels**" research and no part has been copied from any published source (except the references, some standard mathematical or genetic models/equations/protocols etc.). I further declare that this work has not been submitted for award of any other diploma/degree. The University may take action if the above statement is found inaccurate at any stage.



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*DEDICATED*

*TO  
MY MOST LOVING*

*PARENTS  
(Without whom i am nothing)*

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**\*Farkhanda Asad\***

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## ABSTRACT

The study was planned to determine the effects of different hormone doses of 17 $\alpha$ -methyltestosterone (MT) and protein feeding levels on masculinization, growth performance and meat quality in Nile tilapia (*Oreochromis niloticus*). The experiment was conducted in two phases. In phase-I, two experiments were performed in six aquaria (50fry/aquarium) with two replicates. In experiment A, aquarium -1 was used as control in which no hormone was given while in aquaria 2 and 3, the MT were given@ 60 and 70 mg MT/ Kg of feed containing 30 % crude protein. In experiment B, aquarium - 4 was used as control in which no hormone was given while in aquaria 5 and 6, the MT were given@ 60 and 70 mg MT/ Kg of feed containing 40 % crude protein. Both the experiments were run parallel for 30 days. After that, the fry were shifted to 6 earthen ponds (phase-II) in which feed was given without hormones on the same protein level as in phase-1, to monitor their growth performance for 183 days. At the final harvest frequency of males and females was determined by morphometric characteristics and examination of gonads. Results showed that MT treated groups had significantly higher number of males than control and maximum fish growth was recorded in treatments fed with 40% CP level as compared to 30% CP level. The highest percentage of male was recorded (93-100%) at the hormone dose of 70mg MT/kg of feed with 30 and 40% protein levels. Masculinized tilapia showed maximum growth performance (weight gain 160.4 g) with maximum fish production i.e., 2000.7 kg/ha/year at 40% CP diet with 70 mg MT/kg of feed. Among all the sexes (male, female and inter sex), females showed the highest gonadosomatic index (GSI) while lowest GSI was recorded in males. With protein, inclusion of hormone (MT) in diet resulted in highly significantly ( $p < 0.05$ ) protein and ash contents deposition in fish meat among treated groups as compared to non treated groups. In conclusion higher hormonal dose and higher dietary protein level increased masculinization and growth rate in Nile tilapia (*Oreochromis niloticus*).