

MSC THESIS

TITLE	Dietary modulation of muscle growth in Nile tilapia (<i>Oreochromis niloticus</i>)
RESEARCH QUESTION	Does dietary methionine content affect muscle growth dynamics in Nile tilapia?
SUPERVISOR	Johan Schrama; Gauthier Konnert
LOCATION	CARUS (Aquatic Research Facility) & ZODIAC buildings, Wageningen University
PERIOD	November 2019 – April 2020

SHORT DESCRIPTION

This research is part of a PhD project at Wageningen University.

The freshwater cichlid Nile tilapia (*Oreochromis niloticus*) is among the main fish species farmed worldwide. While aquaculture production is booming, resource-use efficiency of fish farms is becoming increasingly important. Nutrient deposition into muscle tissue is the main objective of commercial fish farming, since fillets (i.e. muscle) are the main end-product of most farmed fish species. Post-embryonic growth of fish muscle results from both enlargement of existing fibres (hypertrophy) and recruitment of new ones (hyperplasia). These mechanisms are somewhat flexible, especially during early life. Their modulation may have long-lasting effects on muscle phenotype (number and size of muscle fibres) and growth potential (nutrient utilisation) later on. Muscle growth largely depends on the availability of essential amino acids such as methionine. Dietary levels of methionine may therefore play a role in regulating muscle fibre hyperplasia and hypertrophy in Nile tilapia.

An experiment will be conducted in November and December 2019 to determine whether dietary methionine level affects muscle fibre hyperplasia and hypertrophy in young Nile tilapia.

The experiment will be conducted at the Aquaculture Research Facility of Wageningen University (CARUS) during a 6 to 8 weeks period. Juvenile Nile tilapia (5 grams) will be fed one of four diets differing in methionine content. Muscle samples will be collected at the beginning and end of the experiment to quantify muscle fibre hyperplasia and hypertrophy.

Selected student(s) will participate in conducting the experiment, assist with samples collection and analyses (histology, image analyses) and results interpretation (statistical analyses).

RESEARCH AIM/ SCOPE

The overall aim of the (PhD) project is to gain understanding of Nile tilapia nutritional requirements and their relation to size-related morphological changes (muscle fibre phenotype).

REQUIREMENTS

- Affinity with experimental work (experiment management, laboratory analyses)
- Good analytical and writing skills
- Interest in fish nutrition

OTHER INFORMATION

For more information please contact: Dr. Ir. Johan Schrama: johan.schrama@wur.nl
Ing. Gauthier Konnert: gauthier.konnert@wur.nl