

## MSC THESIS

<b>TITLE</b>	<b>Nutritional programming in Nile tilapia (<i>Oreochromis niloticus</i>)</b>
<b>RESEARCH QUESTION</b>	Does dietary methionine levels fed during early life affect nutrient utilisation in later life stages of Nile tilapia?
<b>SUPERVISOR</b>	Johan Schrama; Gauthier Konnert
<b>LOCATION</b>	CARUS (Aquatic Research Facility) & ZODIAC buildings, Wageningen University
<b>PERIOD</b>	January – June 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. Nutritional programming aims to improve growth performance of farmed fish through dietary intervention during early life. In growing fish, body mass gain mainly results from accretion of white muscle tissue. 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 fed during early life may therefore modulate muscle growth and thereby influence growth potential (nutrient utilisation efficiency) in later life stages.

An experiment will be conducted from January and February 2020 to determine whether dietary levels of methionine fed during early life affect protein retention efficiency in later life stages in Nile tilapia.

The experiment will be conducted at the Aquaculture Research Facility of Wageningen University (CARUS) during a 6 weeks period. It will consist in a 4\*2 factorial design with 4 early life history (i.e. 4 levels of dietary methionine) and 2 dietary protein-to-energy ratios. This balance trial will be run in our recirculation digestibility system.

Selected student(s) will participate in conducting the experiment, assist with samples collection and analyses (wet chemistry) 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

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