

Norhed Report from PD of Aquaculture component:

Project title: Studies on effect of temperature and methionine in diet on juvenile cobia (*Rachycentron canadum*)

Project objective: The objective of this project is test to what extent elevated water temperatures increase the requirement for dietary methionine in juvenile cobia aquaculture.

Specific objective: The main objective of the present study is test to what extent elevated water temperatures increases the requirements for dietary methionine in cobia. The applied aspect is to generate the data that permits to maximise growth and N-retention in cobia. This will be done in two series of experiments with groups of cobia (juveniles) using different levels of dietary methionine and different temperature conditions.

Contents:

- *Effect of elevated water temperatures increase the requirement for dietary methionine on growth, body mass index, liver index, protein metabolism, lipid metabolism and feed efficiency cobia juveniles.*
- *Effect of elevated water temperature increase the requirment for dietary methionine on feed intake, expression of NPY and CCK in juvenile cobia.*

Methods: Details for methods have already presented in the approved research proposal.

Time schedule: This project included two experiments and on a survey of a status of cobia culture in the South, Central and North of Vietnam. The first experiment was carried out from May to October 2016. The second experiment also was carried out between March and May 2017. The survey for a status of cobia culture has been done in the North, Central of Vietnam and the South of Vietnam between August and October 2017.

Output:

- 01 Research proposal (done)
- 01 Annual report and final report (done)
- At least 01 paper will participate in the international conference (done)
- At least 01 paper will be published in national journal (02 draft manuscript)
- At least 02 paper will be published in ISI journal (02 draft manuscript)

Activities have been done

1. The research proposal was approved by supervisor and rector of Nha Trang University.
2. The first experiment was carried out completely. All samples were analysed in Norway and used for writing 02 draft manuscript. The data of the first experiment were obtained and analysed at the end of December 2016 and used for the first of manuscript as draft and will be send to ISI journal from January to February 2017. The second experiment was carried out between March and May 2017. All samples of this experiment will be analysed in Norway from September to December 2017. The reamain samples will be analysed between April to June 2018. The second manuscript will be prepared and sent to ISI journal afterward. The tentative for sending the second paper will be between June and July 2018.
3. Several pictures that related to the Norhed project.



Feed preparing for experiment



Experimental system for high temperature



Feed after preparing as required experiment



Juvenile cobia feeding



Experimental system for control temperature



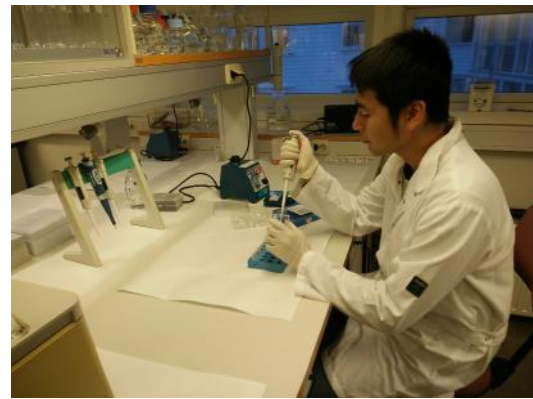
The experiment sampling



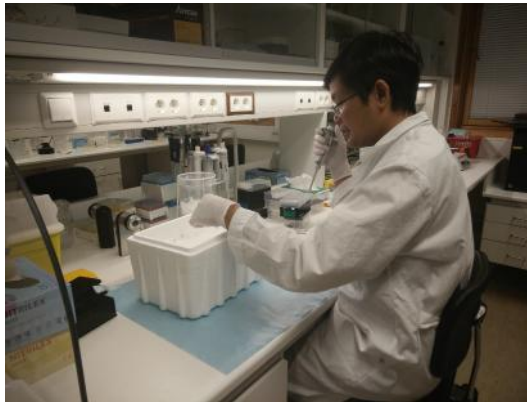
Samples of the experiment for package



Best poster award related to Norhed project



Samples preparing analysis in Norway (biochemical)



Samples preparing analysis in Norway (PCR)



Samples preparing analysis in Norway (biochemical)

4. Budget

- 4.1. Scholarship used as following the research proposal (57,600NOK; 153,000,000 VND)
- 4.2. Material and supply used as following the research proposal (205,608NOK; 546,900,000VND)
- 4.3. Tool and equipment used as following the research proposal (320,370NOK; 852,159,269VND)
- 4.4. Domestic travel used as following the research proposal (31,388NOK; 83,490,000VND)
- 4.5. Data analysis used as following the research proposal (24,061NOK; 64,000,000VND)
- 4.6. International travel will be transferred and used in 2018 (43,200NOK; 114,908,544VND).

Tentative Activities in 2018

1. Manuscript preparing for submitting to ISI journal which used the data from the first experiment.
2. The sample of second experiment will be analysed between September and December 2017. The remain samples will be analysed between April and June 2018 and data analysis will be performed afterward. These data will be prepared for the next manuscript that will be sent to ISI journal. Budget will be used from 2017 to transfer to 2018 (15,000 NOK for Travel expenses (air ticket round trip for PD students to Norway) and VISA fee 3,200 NOK). Total budget: 18,200 NOK (Budget from 2017 will be transferred to 2018).
3. We are going to registration and participate to the appropriate international symposium. Budget from 2017 will be moved to 2018 (25,000 NOK).
4. National paper will be prepared and sent to journal from February to April 2018.

PD candidate

Le Minh Hoang