



Food and Agriculture
Organization of the
United Nations



FAO/China Intensive Training Course on Tilapia Lake Virus (TiLV)

Sun Yat Sen University, Guangzhou, China

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TRAINING COURSE SESSION MODULES SESSION 3 Field work

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SESSION 3

Field work

Introduction

We will visit a tilapia hatchery and fish farm in Guangzhou to become familiar with aspects of tilapia production. We will learn what farm data are collected and used to optimize production. In addition, we will demonstrate techniques used in necropsy and in the sampling of fish tissues for disease diagnosis.

Record-keeping is important for fish producers in assuring that good water quality is being maintained; and determining that the fish are feeding sufficiently. Records are also maintained on the sources that fish stock and movements of stock into or out of the facility. Information of fish health is also important, especially in noting any mortalities or abnormal behaviors.

Even though tilapia are very hardy, maintenance of good water quality is important in their culture. Poor water quality causes stress that can result in reduced growth, suppressed immunity with increased risk of disease, and increased mortality. Important water quality parameters include temperature, pH, dissolved oxygen (DO), dissolved ammonia ($\text{NH}_3 + \text{NH}_4^+$) and nitrite (NO_2^-), both of which are highly toxic to tilapia.

- Tilapia are warmwater fish, with optimal growth temperatures between 25-30°C. They stop eating when the temperature is below 15°C, and cannot survive more than a few days below 10°C.
- Dissolved oxygen (DO) levels fluctuate throughout the day and are influenced by the respiration and photosynthesis of phytoplankton in the pond with the lowest levels of DO usually found in the early morning just prior to sunrise. The DO level should be greater than 1 mg/L, with an optimal range of 6-8 mg/L.
- Dissolved ammonia is produced both as a waste product from fish metabolism and from the bacterial decomposition of uneaten fish feed. Nitrite is generated from ammonia by nitrifying bacteria in the environment. Optimally, ammonia and nitrite levels should be below 0.1 mg/L and 0.2 mg/L, respectively.
- The optimal pH for tilapia culture is between 6.5 and 8.5, the fish cannot grow if the pH is greater than 11.

Learning objectives

This session will allow workshop participants to

- gain knowledge on what elements that are essential for operating a tilapia farm;
- learn what are the important water quality parameters and how the farmers monitor and maintain environmental conditions at optimal levels;
- learn how to handle fish and examine external lesions;
- learn how to aestheticize the fish for necropsy and examine for the internal lesions;
- learn how to sample the tissues (liver, spleen, brain, heart and kidney) targeted by TiLV.

Learning outcomes

At the end of the course module, participants will:

- be familiar with the daily operations of tilapia hatcheries and farms;
- understand how the water quality affects tilapia health;
- learn how to monitor and optimize the water quality necessary for growing tilapia;
- be able to examine fish for general health, and to sample fish tissues for diagnostic analyses.

Module duration

Day 3 (6/20): 8:30-17:00

Day 5 (6/22): 13:00-17:00

Lectures

- Tilapia Necropsy (HTD)
- Clinical signs of TiLV-infected tilapia (MDJ)

Working group activity

- Hatchery/Farm survey form
- Monitor water quality
- Handle tilapia, examination of general health and perform fish necropsy

Background documents

- Short introduction on water quality for freshwater fish culture
- Powerpoint presentations
- Checklists

Key references

- Asia diagnostic guide to aquatic animal disease. <http://www.fao.org/docrep/005/y1679e/y1679e00.htm>