

# New Advances for Warmwater Aquaculture



Dr. Gina Conroy, Pharma Fish, Venezuela

## Management is key to disease control as tilapia producers intensify production

- Key Points
- Hemorrhagic septicemia
- 'Everything is management-related'
- Disease control

### Key Points

- Tilapia now contract many of the same diseases that affect other fish species, in large part due to intensified production practices.
- Improved disease control in tilapia hinges on good management
- The use of immunostimulants, vaccines and, when indicated and permitted, antibiotics may improve health and disease control.

Management practices are key to maintaining and improving the health of intensively produced tilapia, said Dr. Gina Conroy of Pharma Fish, Venezuela.

"A few years ago, people said that tilapia were highly disease-resistant, but that idea has been changing. Now we know clearly that tilapia also succumb to diseases that are not always new problems, but old problems that are reemerging due to intensive production practices," Conroy said.

One example of a disease that is clearly affected by management is columnaris, caused by *Flavobacterium columnare*. When management is less than ideal, columnaris can be a problem from the beginning of the tilapia production cycle to the pre-fattening stage, Conroy said.

Columnaris tends to occur in warm temperatures. Even a 2- or 3-degree rise in temperature during transportation can result in columnaris disease. The presence of ammonia in water when young fish are transferred is also associated with the development of this disease, she said.

"It's a proteolytic bacterium, and the animals do not die because of septicemia, but because of electrolyte loss. Sixty percent of the population can die within 24 hours," Conroy said.

### Hemorrhagic septicemia

Bacterial hemorrhagic septicemia syndrome can strike tilapia and may be due to a variety of pathogens including *Aeromonas hydrophila*, *Pseudomonas* sp. and *Edwardsiella tarda*. These are facultative pathogens — pathogens responding to circumstances — that can be controlled with good management, and it takes careful diagnosis to determine the exact cause, she said.

Conroy noted that in other saltwater species, the bacterial disease vibriosis causes an acute hemorrhagic condition with clinical signs that are quick and very evident. "But in tilapia so far, I have not been able to find this acute condition as a result of *Vibrio*," she said. "I would say that in tilapia, it is a chronic condition. The animals look septicemic and can die, but you do not see that hemorrhage, with animals spitting up blood."

Tilapia may also develop streptococcosis. In Latin American countries, Conroy said, the cause is most often *Streptococcus agalactiae* or *Streptococcus iniae*. Laboratory diagnosis is needed to differentiate the two.

Mortality from streptococcosis differs depending on the country, the population density and the season. Affected fish are described as having erratic swimming patterns, "but that's not always the case," she said. Granulomas are subtle. Pericarditis can result and may be confused with fat around the heart, "but it's not fat; it's a chronic inflammatory reaction."

There may be reddened spots on the liver. Hemorrhagic meninges and polyserositis are other characteristics of streptococcus infection. Another finding may be small blackened areas, representing fibrosis in the fillets, which result in costly losses since the fillets have to be discarded, she said.

#### 'Everything is management-related'

"Remember," Conroy stressed, "that management practices are the main trigger of bacterial and other diseases. The higher the population density, the higher the risk for mortality," Conroy said. Temperature changes, inadequate nutrition, poor water quality or poor soil quality also play a role. "Everything is management-related."

Prevention and control of streptococcosis, for instance, includes decreased density, which isn't always possible if producers have committed to deliver a certain amount of fish at a given date, she said. Maintaining good oxygen levels is equally important.

Fungal diseases in tilapia, particularly saprolegniasis, can be found throughout all stages of production, though it is more often found during transfer from the pre-fattening to fattening stage.

*Saprolegnia* is dermatotropic — it affects the skin and can penetrate to the dermal *stratum compactum*. "This mycosis used to be considered a primary disease, but currently can be considered secondary to management practices," particularly transfer or handling of the fish, she said.

Another fungal disease that affects tilapia is aspergillomycosis. It is primarily seen in animals that have been fed pellets that are already contaminated by the fungus and can result in high mortality.

Conroy cited a European study involving tilapia that appeared to have a septicemic bacterial infection, but histological studies revealed *Aspergillus*.

"We also have *Trichodina*, which is common in tilapia, particularly during the hatchery and nursery stages," she said.

#### Disease control

Improved health and disease control in tilapia hinges not only on good management but also on the use of immunostimulants, vaccines and antibiotics (when they are indicated and permitted), Conroy said.

Immunostimulants increase the immune response and may be helpful during the early stages of development when fry have immature immune systems and prior to transfer or during situations or seasons that are difficult for production. "You know that there are some seasons in the year that are more stressful, when the temperature rises or drops or when you have water-exchange restrictions," she said.

Immunostimulants do not control disease, Conroy emphasized, but they can help in these difficult-to-manage situations.

Vaccination can minimize the effects of disease, which in turn

minimizes morbidity and mortality, promotes optimum growth and improves feed conversion. If a farm has an endemic pathogen that is difficult to eradicate, "then you may need a vaccine if one is available."

Immunostimulants, she added, address a variety of antigens in contrast to vaccines, which address specific antigens. By vaccinating and using an immunostimulant, the response to the vaccine is enhanced, she said.

Antibiotics play an important role in bacterial disease control in tilapia. Although some infections can be controlled with management, outbreaks can lead to big losses and require antibiotic treatment, she said.