Aquafarmer Information Sheet:

Prevention of Black Gill Disease in Marine Shrimp

CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

Recent studies in Guam indicate two types of black gill disease may occur in marine shrimp ponds. The first type occurs during the growout phase of shrimp culture. Fouling organisms, protozoa and bacteria settle on gill surfaces and cause inflammation of tissues, which then turn black. The fouling organisms may become numerous and problematic when shrimp are weak and environmental conditions not good. Gill fouling causes slow growth and lowered survival of shrimp.

The second type of black gill occurs in shrimp after harvest. This makes shrimp look unattractive to buyers and lowers product value. Black gills may be caused by unhealthy animals at harvest time and poor post-harvest handling. In most cases, this problem can be solved by proper handling of shrimp during and after harvesting.

Prevention of Black Gills in Shrimp During Grow-out

The best way to stop the occurrence of black gill disease in shrimp ponds is to keep shrimp healthy. Three parts of shrimp pond management are most important for keeping shrimp healthy and free of black gill disease. They are:

- pond preparation;
- feeding;
- water quality management and sludge removal.

Pond Preparation

The pond must be prepared for stocking by cleaning, drying and filling with filtered water. Organic waste material collects on the bottom of a pond during shrimp growout. The soil or pond bottom will become black and may have a bad or rotten smell. This black material contains hydrogen sulfide, which is poisonous to the shrimp. All of the black material in the pond bottom must be removed by washing with water or by manual scraping. The pond bottom must then be dried in the sun for at least two weeks. This will allow any remaining disease-causing organisms, such as fungi, protozoa, bacteria and viruses, to be killed by oxidation. At the same time, any remaining organic material in the pond will oxidize and become non-poisonous. Finally, the pond should be filled with water of 10- to 20-parts-per-thousand salinity. The water should be filtered through a 1-millimeter screen and should be allowed to sit in the pond for three to four days before the juvenile shrimp are stocked. Shrimp should then be stocked at a density of seven pieces per square meter or less.

Feeding

In order to achieve rapid growth and good health, a high quality shrimp feed of at least 40 percent protein should be used. The feed must be carefully stored in a clean, dry, and, if possible, cool or refrigerated area away from rats and other pests. The feed should not be more than 6 months old. Feed should be applied four times per day at an amount determined by examining how long feed remains in feed trays in the pond. A small amount of feed should be added to each of four trays at feeding time. If the feed is gone in one half-hour, then the amount of feed should be increased. If feed is still in the trays after two hours, then the amount of feed should be reduced.

The shrimp must get enough feed if they are to grow quickly and remain healthy. However, overfeeding the shrimp will dirty the pond, causing increased growth of organic material on the pond bottom, thereby promoting growth of harmful bacteria and other disease-causing organisms.

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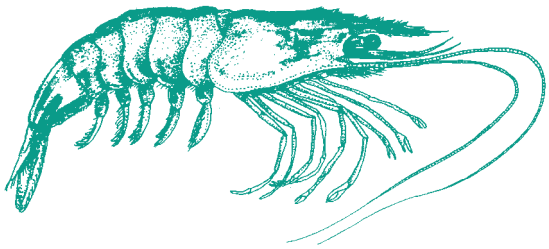
Water Quality Management and Sludge Removal

Regular water exchange is needed to keep a pond clean. The water exchange rate should be about 5 percent per day during the first two months of shrimp growout, 10 percent per day during the third month of growout, after which it should be increased to 20 percent per day until the shrimp are harvested.

If shrimp are stocked at 15 pieces per square meter or more, then aerators or paddlewheels (at 2- to 4-horsepower per acre) should be used at night beginning in the second month of growout and continuously after that until harvest. The aerators should aerate the water and be placed so that the water in the pond will spin or circulate. If the pond has a central drain, then water should be released through the center drain for about five minutes every day beginning in the second month of growout.



Prevention of Black Gill Development After Shrimp Harvest

The most important factor in providing high quality shrimp to market is post-harvest handling. The following facets of handling must be addressed:

gentle handling and fast distribution of the shrimp;
adequate icing of the shrimp, unless sold live.

Gentle Handling and Fast Distribution

Before beginning a shrimp harvest, the farmer must have proper containers and adequate quantities of clean water for the live tank or adequate quantities of ice.

During shrimp harvest by net or by draining the pond, shrimp must be handled quickly and gently to avoid damage. The shrimp should be rinsed clean and transferred to the live tank or to an ice bath. The ice bath should consist of 50 percent ice and 50 percent saltwater. Shrimp can be kept in this ice bath for a minimum of 15 minutes and a maximum of two hours. The water can be drained, and the shrimp kept on ice for up to 24 hours, but they will be fresher and taste better if sold sooner.

Adequate Icing

The amount of ice in the container should be equal to the amount of shrimp. Extra ice may need to be added every four hours. Flake or chipped ice should be used. If prolonged storage or transport of shrimp is planned, shrimp should be stored in layers less than 2 inches thick alternated with 2-inch-thick layers of chipped or flaked ice. The top and bottom layers should be ice.

Transport and marketing should be arranged before the shrimp harvest. It is important to get fresh shrimp to the market and to sell it to consumers as quickly as possible.

If shrimp are properly handled, and the temperature of the shrimp is lowered to 0 degrees Celsius (32 degrees Fahrenheit) after harvest and the cool temperature is maintained, the product will be unlikely to develop black gills, shell discoloration, a red head or to deteriorate in any other way. Shrimp should not be frozen unless they will be held for more than 36 hours before being sold or used.

It is important that all the fresh shrimp sold on Guam be of the best possible quality so that our industry's reputation for providing a premium product will be maintained.

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