

Pond School 2007

Creating and Maintaining Healthy Ponds

Disease Prevention and Control

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Fish health is an important component in aquaculture facilities and understanding both the positive and negative effects is vital in having a successful experience rearing and enjoying fish.

There are a variety of ways to ensure that the fish under our care remain healthy and that also protect fish in waters of the state. We will discuss some ways by which you can improve the health of the fish under your responsibility in three main topics: Prevention, Disinfection and Treatment. We will also cover some pathogens of concern for a variety of fish species.

Prevention of pathogen introduction and disease outbreaks in fish stocks is the most effective way to maintain healthy fish. Though prevention is a straightforward concept, i.e. keep the bugs away; it is complex and not always easily achieved. The easiest way to prevent an outbreak is to keep the organism away from the fish in the facility. The water supply for a facility is critical from both a fish health and fish management aspect. In order of preference the water supply for a hatchery should come from: covered springs, surface springs with no fish present, artesian wells, pumped wells, surface water supplies with treatment to eliminate or reduce pathogens, surface water supplies where no anadromous fish are present and finally surface water supplies with anadromous fish. For any of these cases, amount of water, water temperature, water chemistry and the amount of dissolved oxygen also need to be taken into account. Excluding predators from a facility is also an important way to prevent pathogen introduction and spread.

Bringing eggs to a facility has the smallest risk for pathogen introduction since eggs can be disinfected at spawning time, before shipment and upon receipt. Unfortunately, some pathogens can survive within the eggs and thus are

protected from the disinfection process and can cause problems after the fish hatch. Once fish hatch, appropriate feed types, sizes and quantities are important in maintaining healthy fish. While rearing fish, reducing stress events will enable fish to respond to pathogens.

Disinfection of ponds, incubators, transport vehicles, nets, brushes, rain gear, foot ware and any other equipment that comes into contact with the fish or the water will reduce the possibility of pathogen transfer between ponds or facilities. A variety of chemicals are available to properly treat this equipment but care must be exercised since most of these chemicals can kill fish if not used properly. The most commonly used disinfectants in aquaculture are iodine-based compounds and chlorine-based compounds such as household bleach. When disinfecting equipment one must insure that proper concentrations of the disinfectant are present and that the contact time is adequate for killing fish pathogens. After disinfection, proper rinsing of the equipment must take place to remove traces of the chemical before reuse. Proper disposal of disinfectant solutions or disinfected water must also occur.

Treatment of fish infected with pathogens is unfortunately necessary to reduce fish loss and control pathogen numbers in fish populations. Not all ponds have effluents but in locations where raceway or pond effluent enters waters of the state, care must be taken to not release increased numbers of pathogens. A variety of treatments are available to control pathogens of fish. The available drugs and chemicals vary depending on factors such as whether the fish are destined for human consumption, the life stage of the fish, ability to meet specified withdrawal times and necessity to meet effluent discharge guidelines. While some of these compounds are approved for use in fish according to label requirements, some can only be used with a prescription from a licensed veterinarian.

Bath or flow trough treatments are used to treat external pathogens such as fungi, parasites and some bacteria. Antibiotics incorporated in feed are used to control systemic bacterial infections. Several of these drugs and chemicals and the pathogens they control will be discussed.

Several **pathogens of concern** and the diseases they cause will be discussed. Some of these will be the agents of Bacterial Coldwater Disease, Bacterial Kidney Disease, columnaris disease, Whirling Disease, Ceratomyxosis and external parasites, fungi and viral agents such as Infectious Hematopoietic Necrosis Virus and Viral Hemorrhagic Septicemia Virus.