

Pond School 2008

Fish Health and Disease Prevention

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Successful rearing of fish relies on the application of several factors. Fish health is an important component of these operations and understanding the positive effects of this aspect of fish rearing is essential.

There are several means by which fish at an aquaculture facility can remain healthy and at the same time protect fish in waters of the state. This presentation will cover disease prevention, facility disinfection and treatment of fish for pathogenic organisms. Other topics such as the role of ODFW and fish health evaluation in privately owned facilities, discussion on specific pathogens present in waters of the state and others which have not currently been detected in Oregon and the role of stress in the health status of captive fish.

Prevention of pathogen introduction and disease outbreaks at a facility is the most effective way to maintain healthy fish. Though prevention is a simple concept, keep the pathogens out of the facility, it is nevertheless complex and difficult to achieve. The water supply for a facility is a critical component for fish health and fish management. In order of preference, the water supply for a hatchery should have its origins in: covered springs, surface springs with no fish, artesian wells, pump wells, treated surface water supplies, surface water supplies where no anadromous fish are present and finally surface water sources with anadromous fish. Recirculation of water with proper treatment and addition of oxygen can be used in any of the above situations. In all of these cases, amount of water, water temperature, water chemistry and dissolved oxygen are also critical components.

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. A few pathogens can survive within the egg and thus are protected from the disinfection process. In these as in all cases examination of brood fish for specific pathogens is a critical component. Once fish hatch using appropriate feed types, sizes and quantities are

critical to maintain optimum health. Reduction of stress events will enable fish to properly respond to pathogens.

Disinfection of ponds, incubators, transport vehicles, nets, brushes, rain gear, foot ware and any other equipment that comes into contact with fish or water will reduce the possibility of pathogen transfer between ponds or facilities. A variety of chemicals are available to achieve disinfection but care must be taken since these chemicals can kill fish when not properly used. When using disinfectant, proper concentration of the chemical is present and the contact time is long enough to kill fish pathogens. After disinfection, thorough rinsing of the equipment must occur to remove traces of the chemical before reuse. Proper disposal of disinfectant solutions or disinfected water must also occur.

On occasion, treatments of infected fish are necessary to reduce loss and control pathogen numbers. In facilities where effluents enter state waters, care must be taken to not release amplified numbers of pathogens. A variety of treatments are available to control fish pathogens. The available chemicals and drugs vary depending on factors such as whether the fish are destined for human consumption, life stage of the fish, ability to meet specified withdrawal times and necessity to meet label directions state regulatory agency effluent guidelines. While some of these compounds are labeled for specific purposes, some can be used with a prescription from a licensed veterinarian and some newly approved ones under Veterinarian Feed Directives. Bath or flow-through treatments are used to treat external pathogens such as fungi, parasites and some bacteria. Antibiotics incorporated in the feed and in some cases are injected into fish are used to control systemic bacterial infections.

Several pathogens of concern and the diseases they cause will be covered in the presentation. Some of these are Ceratomyxosis, Whirling Disease, agents of coldwater disease and bacterial kidney disease and viral agents such as Infectious Hematopoietic Necrosis and Viral Hemorrhagic Septicemia.

Currently, ODFW Fish Health Services (FHS) staff examines fish from private trout facilities for the presence of *Myxobolus cerebralis*, the causative agent of Salmonid Whirling Disease. This exam is performed at no cost to the facility owner as it is covered by an annual Sports Fish Restoration grant that is supported by 75% USFWS and 25% State funds. When high loss is occurring at a private facility, and where the effluent of the facility enters waters of the state fish examinations can be performed by FHS staff. The fish must be brought or shipped to one of the three FHS laboratories in the state for the examinations to occur. Other examinations must be performed by approved private laboratories or licensed veterinarians.

Rules to control the introduction of fish pathogens into the state or transferred within the state are present in the Department's Fish Health Management Policy (http://www.dfw.state.or.us/fish/nfcp/health_mgmt.asp). These rules have been set up because the introduction of pathogens into fish populations can occasionally have devastating effects.