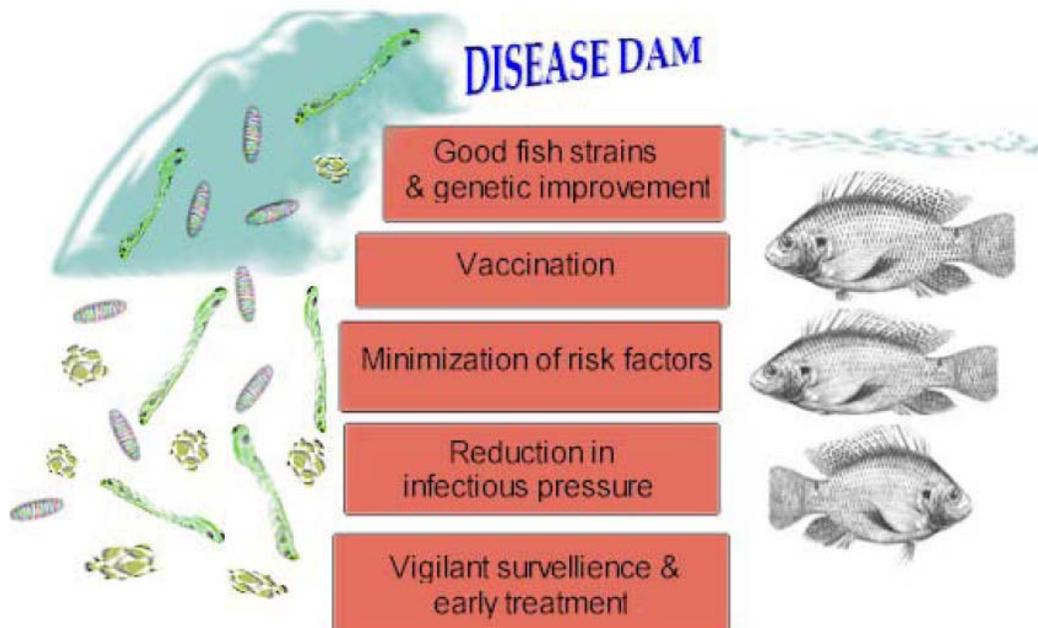


Fish Health Basics 101 (A Review)

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Tilapia production, like any form of animal husbandry, is prone to disease, which can cost farmers losses due to mortalities and decreased production performance (growth rates, feed conversion, etc). Like other forms of intensive animal production, we can apply the same basic principles in helping reduce the risk of disease in tilapia that have been successfully used in poultry, bovine, swine, and other fish species such as salmon. For any animal, including tilapia, there are 5 areas that should be addressed when there are concerns about preventing or controlling any particular disease. Every disease responds differently to these 5 areas. Science and experience will tell farmers which ones to concentrate on for each disease. In general, ALL have to be addressed to some extent, but dealing with some are easier and less cost-prohibitive than others, and again, these can be very disease specific. The 5 areas are: **1) Early detection and treatment; 2) Pathogen load reduction and biosecurity; 3) Risk factor reduction; 4) Immunoprophylaxis (vaccination); and 5) Genetics (good strains/stock).** All these areas play off of each other and if it is not possible to adequately address one or two areas, then extra attention must be paid to the others (think of these as 5 “bricks” in a “disease prevention dam” (see accompanying figure): if one is shorter, then make the other ones larger). None of this is proverbial “rocket science”, but as the saying goes: “the secret to fish farming is doing the common things uncommonly well”.



For the first area, it has long been established that **early detection and treatment** saves far more fish than waiting until the “fire is raging”. A comprehensive and vigilant monitoring system will pay for itself over and over. Don’t relax on this one. As with most fish species, treatment options are few and far

between, but have things ready to go into action at the “drop of a hat” with an established threshold for response in detection levels and/or mortalities.

One of the most important things you can do is put together a meticulous **biosecurity and pathogen load reduction program** – to either prevent or control diseases. This veterinarian has seen many diseases mitigated by rapid removal of mortalities and shed pathogens WITHOUT ANTIBIOTIC TREATMENT. The ramping up of pathogen load in the wake of an outbreak is one of the most important factors in accelerating production losses. Disinfection of holding facilities and equipment with an approved aquaculture disinfectant should be a staple part of tilapia husbandry.

Risk factor reduction is the overall game of fish farming. The whole goal is to maximize throughput, while maintaining a healthy and humane environment for your fish – walking that fine line. Common risk factors include: density, water quality, feed quality, tank size/shape and handling practices. Each disease has its own particular set of risk factors which the respective pathogen likes to take advantage of. There is nothing like good “stockmanship” to help you with this one. Studies in agriculture have shown that given the same equipment and facilities, good personnel can be the key difference instrumental in maintaining acceptable risk factor control.

Although a standard in agriculture, **vaccination** lags behind in fish husbandry, partly because of the relative newness of modern fish production and the varied nature of disease, this tool should not be overlooked. Vaccination should never be thought of as a silver bullet or used as a crutch with the other 4 areas being ignored. Common tilapia diseases such as *Streptococcus* sp. respond very well to a good, customized vaccination program. Addressing the four other fish health areas in concert with vaccination will certainly have a synergistic effect in the overall fish health program and greatly help reduce the risk of production disruption. The other key to successful vaccination is ensuring that the cost of the vaccine and its application pays for itself in production losses that it saves.

Every farmer knows the importance of good **genetic strains** to the success of their business. The international *Tilapia niloticus* genome project is a testament to that. A good strain/species helps immeasurably with the other four areas and it is anticipated that great strides will be made in tilapia farming genetics in the near future.

Hopefully, this article has been a useful synthesis of what you as a tilapia farmer, is already aware of, but needed some prompting (in the spirit of Samuel Johnson’s quote: “*Never be afraid to remind people of the obvious, it is what they have most often forgotten*”). If you and your staff live by 5 principles of good herd health basics, you will certainly be doing the best that you can to guard your livelihood against one of the main challenges to modern fish farming success.

Dr. Mitchell is a long-time fish veterinarian/marine biologist with expertise in designing fish health audits and customized vaccination programs for clients. He is affiliated with Western Chemical and Syndel Labs (Aquatic Life Sciences), a world leader in fish health products (www.wchemical.com and www.syndel.com).