

# AQUAINTECH INC.

AQUAculture **IN**formation **TECH**nology

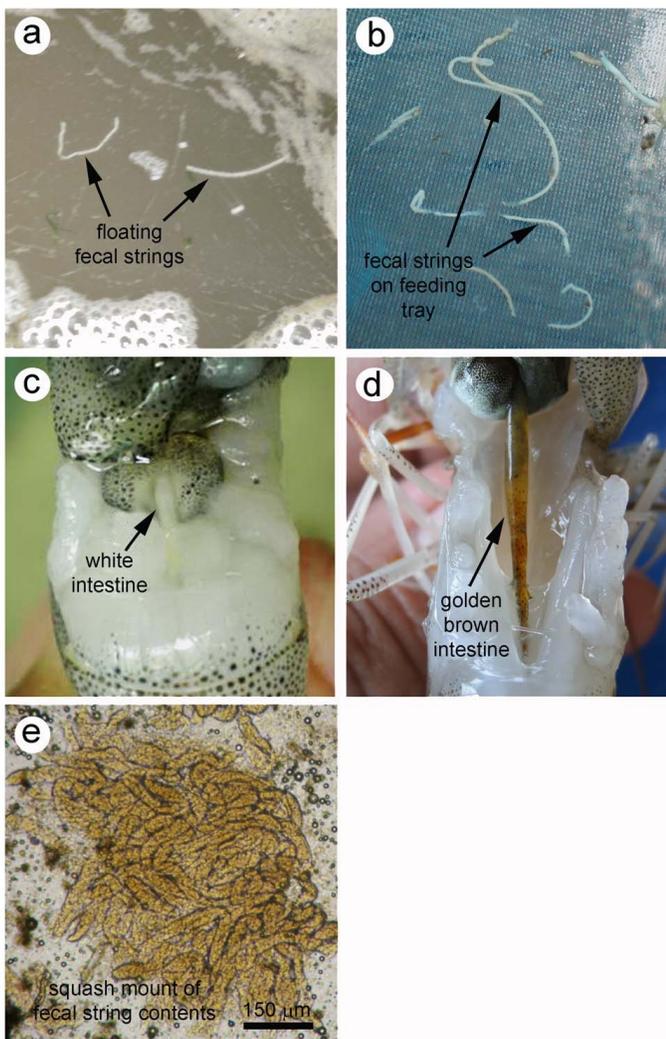
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## White Feces Syndrome

Farmers have reported seeing white feces on and off over the years, although it has only been recently that it has been associated with acute disease. The exact cause is still being debated although there are some strong causal relationships with several strains of vibrios. The photos below show the typical pathology as reported in Thailand in early 2010. Farmers had recently decided to boost stocking densities driven by demand.

Water temperatures were at the upper end of the comfort range for the shrimp, > 32 C, and organic matter levels accumulated because of higher feed rates. It is highly likely as well that there are other issues that are involved as it appears that with low DO levels (less than 3) and low alkalinities (less than 80) mortalities are higher. It was first reported in *P. monodon* being reared at low salinities (3 to 5 ppt).

The exact cause of the disease has yet to be determined. It was thought by some workers that gregarines were involved although at this time the evidence does not support this. The structures seen in e are reminiscent of gregarines but they are not. A consistent feature of the disease is the damage to the digestive system. Although the final cause of the problem has not been universally agreed upon by workers the presence of a number of toxigenic vibrio strains seems to be a consistent feature in the disease process and thus efforts to control the levels are, at this time, the best approach to take. Interestingly enough antibiotics are not reported as being effective in stopping the disease process.



The evidence is strong that the disease is not due to the presence of high levels of gregarines. More than likely it is a result of high levels of organic matter allowing the growth of certain vibrio strains that, like EMS,-except with a different target organ produce a toxin that damaged the

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intestinal cell walls resulting in high levels of mucus secretion and sloughing of the material. This is seen as wide fecal strands. Often the first sign of the disease is noted in feeding trays although there can be considerable loads in the water as in the photo below. Note that there is an accumulation of blue green algae as well-a strong indicator that there is inadequate control of the levels of organics in the ponds.



The science on control is weak, i.e. there is more anecdote than properly controlled studies. Using Bacillus based spore products have been reported as being an element of control by several workers. Thus, it stands to reason that at the very least the use of PRO4000X for treating the pond bottoms would be part of the solution. I would also strongly encourage feeding the animals as well with the Bacillus spores. This can be done using AQUAPROB, milled into the feed or cultured and using this liquid suspension as a top dress on the feeds. Alternatively Aquaintech Inc. sells a chemical that is used as disinfectant and that our clients routinely use in Mexico and in Vietnam to rapidly kill off intestinal vibrios. This can be top dressed at very low levels.

It is VERY important however to recognize that the environment cannot be one where there are consistently high levels of stress on the animals. Successfully reducing the vibrio loads in the environment and through extension, the gut seems to be the route to take. Oxygen levels should always be at or near saturation. Low DO levels stress animals and regardless of the perception of the farmer they weaken the animals and impact their immune systems. Growing animals at high temperatures, exposing them to sudden dramatic environmental shifts, etc. can all contribute to susceptibility.

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