WHAT WILL PCR BRING TO SHRIMP FARMING: CONTRIBUTION, COMPROMISE OR CONFLICT?

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Importance of pathogen diagnosis for managing shrimp health

Health management based on capabilities to rapidly and accurately detect pathogens and strategies to prevent and treat disease have been pivotal to the success of livestock industries, particularly those involving species farmed intensively such as chickens and pigs. With such terrestrial species, health management systems incorporating vaccines and other disease prevention measures are relatively well established. However, with aquatic species, the rapid expansion of intensive aquaculture industries in the past few decades has resulted in challenges to overcome regular onslaughts of newly emerged diseases. In the context of marine shrimp culture, devastating viral diseases, in particular, have proved difficult to combat due to the lack of effective vaccines. For this reason, sensitive virus detection methods and/or the use of virus-free seedstock to exclude infections from entering ponds are the current best practices for controlling disease in cultured shrimp.

To address massive reductions in production output of farmed shrimp that occurred worldwide during the 1990's due to viral disease, domesticated specific pathogen free (SPF) breeding populations of the Pacific white shrimp (*Penaeus vannamei*) were successfully established at the Oceanic Institute in Hawaii (Wyban *et al.* 1992). The commercial availability of these SPF *P. vannamei* in the late 1990's resulted in their extensive uptake by shrimp aquaculture industries in both Southeast Asia and the Americas to circumvent production losses. Due to the massively improved farm production yields that resulted from the uptake of SPF *L. vannamei*, substantial efforts are currently underway to domesticate the giant tiger shrimp (*Penaeus monodon*) and select for SPF breeding stocks to replicate and further improve the commercial successes achieved with SPF *P. vannamei* (Withyachumnarnkul *et al.* 1998. Preston *et al.* 2009, Preston and Coman 2009). Even with improved farm yields through farming SPF *P. vannamei*, the global demand for shrimp product still outstrips supply and thus shrimp will remain a relatively high priced luxury food item until production can be enhanced further, possibly through the use of SPF *P. monodon* selected genetically for fast growth (Preston *et al.* 2009, Preston and Coman 2009).