

## **The Thai Shrimp Industry – Application of Science and Technology**

Robins P. McIntosh  
Charoen Pokphand Foods Public Co, Ltd;  
Bangkok, Thailand 10500.  
[robmc101@yahoo.com](mailto:robmc101@yahoo.com)

Thailand has developed a very successful shrimp industry that has benefited both the country and people of Thailand. The industry has not been without issues, but as issues develop Thailand has evolved an informal partnership of government, farmer associations, universities and large corporations to provide solutions. Solutions are sometimes in the form of incentives, and sometimes regulation, but most often the solutions are found in science and the application of technology. The Thai industry is based on small pond, intensive culture technologies. These technologies depend on hatcheries to supply large quantities of post larvae, feed mills that produce complete diets, and mechanisms to oxygenate ponds on farms with and without electricity. As the industry developed there were many areas that had incomplete science, and as a result farmers often managed ponds and farms in ways which were unsustainable. Antibiotics were used to cure disease, large quantities of water were pumped to exchange ponds in order to control nitrogen wastes, and ponds were constructed in low elevation areas occupied by mangroves. By 1990 the industry was entering a period of stagnant growth with more and more sustainability issues confronted the Thai farmer. During this period of industry stagnation science was developing in areas that before had not been available to farmers. Science defined shrimp pathology, the epidemiology of shrimp disease, microbiology of both pathogenic and beneficial bacteria, the science of pond soils and substrates, the domestication and application of selective breeding of shrimp, and provided a more complete understanding of the biology of the shrimp. As this science became available to aquaculturists, applications were created for shrimp farmers to become more sustainable and efficient. Thailand has always been a front runner in seeking and implementing these new science based applications. As disease became an issue in the 1990's Thailand developed many pathology labs and made PCR available to all farmer and hatchery operators. Understanding the epidemiology of local diseases allowed the technicians to create effective pond bio-security. As the liabilities of depending on wild broodstock became apparent Thailand quickly adopted domesticated Specific Pathogen Free shrimp. Subsequent investment and application of shrimp genetics has allowed the Thai farmer to achieve farming efficiencies never before thought possible. The science of microbiology has resulted in the discovery and application of many beneficial bacteria that create more optimum growing conditions for the shrimp. Increased understanding of the biology of shrimp has resulted in pond management practices that result in higher survivals, faster growth rates and higher yields. With labor shortages and increase in labor costs Thailand is again turning to technology to mechanize pond and farm management. Today Thailand leads the world in the export of shrimp products. This success is a validation of science based aquaculture and the ability to quickly adopt new technology as it becomes available.