

**PRODUCTION OF MARINE SHRIMP IN THE OUTDOOR POND WITH  
CLOSED RECIRCULATING SEAWATER SYSTEM: A PROMISE FOR  
SUSTAINABLE AQUACULTURE IN THAILAND**

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Penaeid shrimp, especially Black Tiger shrimp (*Penaeus monodon*), is the most important aquaculture product of Thailand. A rapid expansion of shrimp culture area after the 1980s stimulates the concern on environmental impact from shrimp farms. This has been considered with fully responded by governmental agencies particularly the Department of Fisheries (DOF), research institutes and universities. Many regulations for environmental protection such as the water quality standard for wastewater from shrimp ponds, the Good Aquaculture Practice, the Code of Conduct for shrimp industry and the regulation for organic marine shrimp farming were announced and promoted by DOF. Recently, shrimp production pond with closed recirculating seawater systems (closed system) become more acceptable for farmers. One of the common systems is the use of large reservoir pond that is equal or larger than the culture pond. Water in the reservoir is naturally treated by both physical and biological process with natural microorganisms, plant (phytoplankton and/or seaweed) and animals (shellfish and/or filter feeder fish). Moreover, many prototype of water treatment systems that are integrated within the shrimp pond have been demonstrated by DOF, companies and also farmers. Examples of the treatment systems are sediment dredging, vertical mixing by water-lifted air duct and central sediment drainage. An integration of nitrification biofilter in fish and shrimp ponds has been studied by the Marine Biotechnology Research Unit and will be presented. Our ponds composed of biofilter units made of cylinder shape plastic fibre located 10-20 cm below the water surface. This biofilter system could reduce ammonia to nitrate via nitrification process and maintain the water quality within the safety range for shrimps. This presentation will be arranged into two parts. The first part will be the reviews of aquaculture recirculating systems in Thailand and the second part will be the results from our experiment of using nitrification biofilter in fish and shrimp ponds.