

Recent developments in shrimp feeds and feeding

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Over half of the shrimp available in the market place (3.4 million tonnes or 52.1% of the global total of 6.5 million tonnes in 2008; FAO, 2010) is currently farmed, with total shrimp aquaculture production valued at over US \$ 14.3 billion, and the Pacific white shrimp *Litopenaeus vannamei* being the top cultured aquaculture species by value in 2008 at US \$ 9.0 billion. Moreover, shrimp aquaculture production has been growing at an average annual compound rate of 9.35 percent per year since 1990, with the sector growing five-fold by weight from 679,976 tonnes in 1990 to 3,399,105 tonnes in 2008 (FAO, 2010). However, the rapid growth and expansion of the sector would not have been possible without the development and growth of the shrimp aquafeed sector; compound shrimp aquafeed production growing over five-fold from under 1 million tonnes in 1990 to 5.0 million tonnes in 2008, and the shrimp aquafeed sector expected to continue to grow to 6.2 million tonnes in 2010, 8.8 million tonnes in 2015, and to 11.3 million tonnes by 2020. With shrimp feed costs usually representing over 50 percent of total shrimp production costs, and an economic climate of steadily increasing feed ingredient and processing costs, considerable efforts have been placed by feed manufacturers and farmers alike, toward reducing feed costs per unit of shrimp production, either through 1) improvements in feed ingredient selection and feed formulation, 2) improvements in feed ingredient processing and feed manufacture, 3) improvements in on-farm feed and water management, and 4) improvements in shrimp genetic selection. The current paper reviews recent trends and developments concerning the selection and use of feed ingredient sources by the shrimp aquaculture sector, including efforts to reduce the dependence of the sector upon fishmeal and fish oil. In addition, the paper discusses recent developments in feed processing and on-farm feed and water management which may assist with the further growth and sustainable development of the sector.