Understanding the Role of Shrimp Gut Microbiome: A Key to Functional Aquafeed Development

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ABSTRACT:

The interactions between host and gut microbiome range from being pathogenic to mutualistic, suggesting that bacterial community structure can directly impact the health of their host. Understanding the correlation between shrimp growth and their intestinal bacteria would be necessary to optimize animal's growth performance and survival. The innovative farming methods including functional feed additives to promote shrimp growth and health can be a game-changer to modulate and manipulate the gut microbiome to enhance the host's health. This approach does not only allow farmers to increase farming throughput and production but also minimize the environmental footprint by reducing the use of chemicals in the field. Increasing evidence on the importance of gut microbial population to their host had drawn much attention to prebiotics (dietary fiber to promote the growth of beneficial bacterial) and probiotics (beneficial bacteria) as promising functional feed ingredients. While their use is widespread among shrimp farmers, many pre- and probiotic products are developed and applied without much understanding of the microbial dynamics and functional roles in the shrimp microbiome. Once that knowledge is acquired, it would then be possible to precisely select a specific probiotic or a combination thereof with desirable functions and mode of action to deliver maximum effects.

KEYWORDS:

gut microbiome, prebiotics, probiotics, shrimp