

Dear Sir or Madame,

I think NOAA is identifying an important trend in aquaculture research. One good approach is to find the solution through breeding for acceptance of vegetable based diets.

Shrimp feed is the major component of production cost, accounting for 60-80% of total cost, and protein is one of the most expensive components in shrimp feed. Many research projects have been conducted to optimize dietary formulation in improving production performance, maximizing efficiency of nutrient utilization, reducing feed cost and minimizing nutrient loads in effluents. It is well known that dietary nutrient requirements vary largely between the different penaeid shrimp, for example, *P. japonicus* and *P. monodon* have a much higher dietary protein requirement than *P. vannamei*. For a given species, almost all nutritional studies are done using shrimp with a narrow genetic diversity, and it is literally unknown if the continuous genetic improvement in certain shrimp production traits, which might have changed underlying biological or physiological processes, has altered the nutritional requirements of that species. Modern aquaculture has been criticized for increasing the pressure on marine resources as feeds. Improving feed efficiency for marine proteins and utilizing alternative plant proteins are ultimate solutions to reduce feed costs, minimize environmental loading and alleviate growing demands for natural marine resources.

Genetic selection for feed efficiency has been widely used in cattle, pig, poultry etc. Studies have also demonstrated that selective breeding is a potential tool for improving feed efficiency in various fish species. For shrimp, little information has been published. To facilitate cost-effective and environment-friendly shrimp aquaculture, one way is to develop new feed formulation for the genetically improved shrimp stocks so that their genetic potential can be fully realized. An alternative way is to select shrimp that have higher dietary protein conversion ratio and can utilize plant proteins more efficiently. In spite of its importance, there is a critical gap in the knowledge base that centers on how nutrition relates with genetics in shrimp. It would be very beneficial to conduct pioneer experiments to estimate genetic parameters (variability and heritability), which are fundamental to determine the genetic potential of a selective breeding program for improving dietary protein efficiency and utilization of plant proteins by *P. vannamei*, the dominant shrimp species cultured in the US and in the world.

Thank you for your consideration in the comments.

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