Aquaculture: Commitment to Health, Wealth & Cleaner Environment

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AQUACULTURE, predominantly a rural activity in India, fulfils the preferential demand for aquatic food of high nutritious value and also improves the rural economy. Thereby, ensuring food safety by avoiding farming practices that involve high fish stocking densities beyond the carrying capacity, frequent water exchange, and inconsiderate use of feed, fertilizer, and drugs is important. Ensuring the safety of aquaculture products for human consumption is of utmost importance for the future growth of aquaculture.

Aquaculture is becoming more diverse; earthen pond aquaculture is still the most common. However, other efficient production systems such as tank, cage, raceway, integrated, and pen cultures are also used. A challenging task in changing climate, especially freshwater shortage, is quality fish production relating to food safety, human health, and environmental sustainability. More than any other animal production system, overall management of undigested material and metabolic end products released by fish into the ambient water bear greater implications in aquaculture since water is not only the culture medium but also the receptacle of waste, and the production itself depends on water quality.

Fish has incomparable nutritional value mainly due to its excellent protein quality (high proportion, 65-70%, of myofibrillar protein and low proportion, 5-6%, of stroma protein), high chemical score (70) and better protein efficiency ratio (3.5). It is also rich in long-chain n-3 PUFAs like EPA (20:5n-3) & DHA (22:6n-3), conferring good health benefits. The selected micronutrient content in some small indigenous fishes is remarkable; the fatty acid profile of the Cyprinidae, *Labeo bata,* indicates nutritional richness in terms of long-chain n-3 fatty acids.

It is felt that there is ample scope for improving the product quality through the large-scale adoption of better management practices and optimisation of the supply of various nutrients through a nutrition-smart precision feeding strategy. Besides, to maintain the current growth rate and consumer demand for fish and prawns, quality assurances of feed ingredients are crucial for farm produce improvement. Fish feeding impacts several quality parameters, like n_3 PUFA and vitamin B_{12}. Both these critical nutrients are not available in most of our daily food items. There is much scientific literature on the merits of fish eating on human health.

It is also now known that one can tailor aquaculture product quality by properly applying nutritional principles. It is well-known that in contrast to protein, the lipid composition of fish is not genetically determined but depends largely on the dietary fatty acid profile.

Value-Added Fish for Entrepreneurship Development

With regard to value addition in the processing of fish products, ICAR-CIFA (Central Institute of Freshwater Aquaculture), Bhubaneswar, developed an improved variety of rohu or *Labeo rohita* following selective breeding protocol, which is not only fast-growing but is fairly resistant to disease infestation caused by the bacterium, *Aeromonas hydrophila.*