

Seafood value addition

Current trends and future prospects

Parvathy U, Binsi P K, Ashok Kumar K and Ravishankar C N

ICAR-Central Institute of Fisheries Technology, Kochi, Kerala 682 029

Value addition is the key word in the seafood processing industry as it widens the possibilities of maximum returns by foreign exchange earnings. India, being one of the fastest growing economies and the second largest consumer market in the world, offers a strong platform for processed seafood industry. Based on the market requirement, seafood value addition can be diversified. The category of value added commodities range from live seafoods to ready-to-eat convenient products. Value addition also explores new dimensions for the effective utilization of fishery by-catches. India, being adequately equipped with skilled manpower and the dominance in several agri-commodities offers advantage to make strong seafood market capture with a wide array of commodities.

Keywords: Fish Processing, Seafood Market, Surimi, Value Addition

VALUE in the context of food, is an aggregation of functional characteristics arising on account of nutritional and sensory aspects at superior quality as well as affordable price. Further, it promises utilization of the under-exploited nutrient rich resources in the most effective manner. Value added fish products are presented in a preparatory and convenient form. It can be products ranging from simple dressed/trimmed, minced forms to advanced ready-to-eat styles. Value addition can also be in the form of a new package in eco-labelling with multiple dimensions of flavor profiles on account of added ingredients. It is one of the possible approach to raise profitability in seafood industry, which is becoming highly competitive, lucrative and increasingly expensive.

The commonly practiced processing techniques in seafood sector include curing, which includes salting, smoking, drying, pickling, canning, freezing, surimi processing, etc. Some high-end technologies, viz. minimal processing, irradiation

technologies, etc. are effective but restrictedly adopted by the industry. However, most of the exports are currently limited to frozen forms, and thus not explore absolute benefits from aquatic resources. A value addition to the level of about 23% is reported for seafood in India but not beyond the level of dressed fish and deveined/ blanched shrimps. Hence, standardization of new processes and protocols have to be made for enhancing value addition and thereby effective utilization of fishery resources. In this regard, development of indigenous processing machinery is an immediate necessity in fisheries sector. At present, Indian seafood consumers prefer fresh fish and there is an increasing trend in the utilization of value added fish products as evidenced by their availability and demand in modern super markets.

Value addition: Future dimensions

Value addition in seafood sector covers a wide array of products from live commodities to ready-to-

eat/serve convenience products. India, being the largest producer of several agri-commodities, offers wide possibilities of value addition and product development for the domestic as well as export market. Ethnic Indian recipes like fish/shrimp pickle, unique dishes of various cultural populations, diverse marinated recipes, etc. offer attractive opportunities for seafood value addition. However, these captivating factors are flattened by the poor infrastructure development and capital investment affecting the development of processed seafood market of the country.

Ethnic seafood products are those that are traditional, region specific and are being prepared and consumed by different cultural community. Some of these products are preserved or processed using centuries-old indigenous knowledge of fermentation/drying/smoking, etc. Globalization has accounted for a high demand for these ethnic food products and hence approaches towards its popularization by

adopting effective processing techniques can bring a huge adoption for these commodities.

Surimi and surimi based products are yet another least explored area of value addition in the country, inspite of having a number of lean varieties of species globally identified for surimi manufacturing. Surimi being a wet concentrate of myofibrillar protein, is an intermediate product for the development of highly demanded commodities such as sausage and analogue products. Globally, there is a constant search for suitable and promissive raw material for surimi production. Surimi production from farmed species shows huge potential for a variety of value added products. Furthermore, the utilisation of farmed varieties for surimi and surimi based products will strengthen the link between increased production and resource utilization.

Thermal processing is a technology of great significance in many developed countries. Though expensive, this technique leads to the production of a variety of convenience products which fetches higher margins in export market. However, the severe thermal conditions in this processing technique leads to textural disintegration, limiting the process adaptability to a few species like tuna, crab, lobster, shrimps, etc. Hence, emerging species for thermal processing is demanded which further broaden the scope of value addition.

Curing and drying, even though an age-old practice, opens up new dimensions and possibilities towards value addition in domestic as well as international markets. In India, as per the estimates, about 17-20% of the total catch is converted to dried products and dry fish export contributes to about 7.86% of total fish exports. However there are several factors hindering the addition of dried fishery products to the product profile. The major one being, lack of standard operating procedures as drying is still practice in traditional method of processing. Moreover, there is a general concept that drying

is a secondary method for preserving low value varieties, which compromised quality. Attempts towards improving the handling practices right from the point of raw material harvesting till marketing, popularisation of improved packaging practices, use of hygienic energy efficient mechanical driers, and adequate extension services can facilitate better adoption of drying practice in seafood sector.

Although fermentation has traditionally been used to preserve fresh fish, especially in tropical climates, today it is used to enhance nutritive value, improve appearance and taste, destroy undesirable factors, and to reduce the energy needed for cooking. However, it takes long duration to develop the characteristic features of fermentation. Smoking of fish is done primarily for the unique taste and flavour, however, the texture of flesh may be affected during the smoking process. Hence, preparation of flavoured products with typical flavour extracts may be advised to reduce the process time and can be projected as a minimal processing protocol with product diversification scope for chilled high value fishes like sea bass, cobia, pompano, and grouper. This opens up value addition opportunities in terms of less intense flavour of cultured species owing to the difference in food chain followed in captive condition compared to the basic seaweed based food pyramid in marine ecosystem.

Recently, the global seafood market indicate diversification with increased consumer demand towards more convenient on-the-go products, having superior nutritional value. In this line, a series of intermediate/low moisture foods such as nutritional bars, meat flakes, noodles, pastas, etc. have occupied the modern domestic and export markets. They have a low water activity (0.7-0.9), stable under ambient conditions for longer duration and can be used with/ without rehydration. Techniques like food extrusion provides a great versatility for the

development of such nutritious and convenient food products especially cereal-based snacks and food products. Many farmed species with whiter, and tastier flesh are found to best suited for these innovative products. Further utilization of underutilized fishery resources for the formulation of such products are also highly recommended.

Value addition of secondary raw materials

A considerable quantity of waste is being generated from seafood processing operations about 70% of raw material which is alarming, and is costly to dispose. The proteinaceous nature and richness in biomolecules with medicinal and therapeutic value has upgraded the value of fish processing waste, classifying it as 'a certified waste'. Process discards, primarily composed of head, viscera, scale, skin, bone, fins, eyes, gills, etc. is a major source of high value by-products which are nutritious as well as possess immense bioactivity. These include protein and bioactive peptides, PUFA, collagenous matter, chitin, chitosan, glucosamine, minerals, pigments, etc. Cost effective bulk reduction technologies may be adopted for the conversion of these valuable discards to high efficiency products ranging from farm supplements such as manure, fertiliser, foliar spray, aquaculture and animal feeds etc. to high end products having human food and nutraceutical applications. Successful waste management programmes can be implemented by strengthening the baseline data which includes information on waste generation and disposal, local facilities, and major stakeholders involved. Lack of clear legal classification of secondary products in the international market, lack of unified protocols for quality assurance and most importantly, limitations in know-how with regard to the value generation possibilities from process discards are the major factors affecting the development of this sector. Development of efficient means of networking and establishing inter-industrial linkages between

potential stakeholders, generation of pilot facilities for testing and demonstration of innovative technologies, encouraging more partnership programmes, initiating and framing public policies against seafood process discard dumping, and its effective utilization are a few measures that can improve the current scenario in the sector.

Value added products: Market potential

Seafood processing and marketing has become highly competitive that the exporters are shifting towards value addition for increased margins. Marketing of value added products is highly capital intensive, dynamic, sensitive and complex, unlike traditional seafood trade. Intense market studies coupled with attractive presentation by innovative and

attractive packaging techniques and advertisement are mandatory for the successful launch of a new food commodity. This in turn, creates confidence to the consumers to experiment with a new product launched in the market. Most of the market channels currently used is not suitable to trade value added products. An effective approach in this regard would be a proper chain, linking consumer markets directly to the source of supply.

SUMMARY

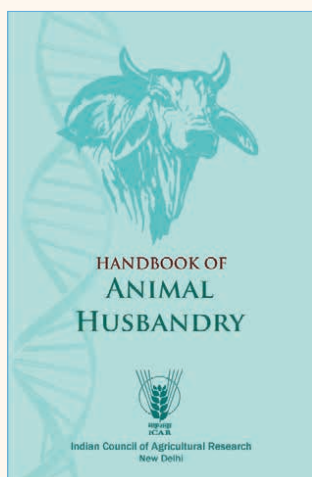
Seafood product diversification by value addition of main and rest raw material can augment marketing of these commodities in food and nutraceutical sector. Simultaneously, it leads to reduced post-harvest losses contributing to global economic growth and nutritional security.

Technology up-gradation remains to be the key element in value addition domain, supported by minimal processing options, innovative smart packaging concepts, intelligent quality monitoring systems. Innovative concepts and product development addressing niche markets is an important strategy for improving farm income. Developing such technologies with a feasible business model has immense industrial potential assuring additional income to the entrepreneurs. Inevitably, value addition in seafood sector upgrades seafood chain, as well as development of intelligent and smart transportation techniques for increased product quality and stability.

Corresponding author's e-mail:
directorcift@gmail.com

HANDBOOK OF ANIMAL HUSBANDRY

Livestock sector has created a significant impact on equity in terms of employment and poverty alleviation. After staple crops, livestock sector is the second most important contributor to the agricultural economy. The



producer prices of meat, eggs and milk, in India appear to be highly competitive as the domestic producer prices of these products are quite low compared to the ex-farm gate prices of major exporters in the world markets. A knowledge resource is essential to harness the potential of animal production. The Indian Council of Agricultural Research brought out first edition of *Handbook of Animal Husbandry* in 1962 for serving the end-users ranging from livestock owners to academicians. This is the Fourth revised and enlarged edition of *Handbook of Animal Husbandry* which includes 48 chapters under nine sections, such as Animal Genetics and Breeding; Animal Nutrition and Feed Technologies; Animal Management; Animal Reproduction; Animal Health Management; Animal Biotechnology; Animal Products, Technology and Machineries; Economics and Trade of Livestock and Poultry Enterprise; and Social Sciences. It has 19 new chapters like Impact of Biotechnology, Nanotechnology: Applications in Animal Sciences; Carbon Trading: Mechanisms and Opportunities in Livestock Sector; Intellectual Property Rights

Regime; Indigenous Technical Knowledge etc.; and old chapters were revised holistically. The fourth revised and enlarged edition of *Handbook of Animal Husbandry* will prove useful to the students, teachers, livestock/poultry farmers, and to especially those who visualize the economic growth of country with the support of livestock sector.

TECHNICAL SPECIFICATIONS

No. of pages : i-x + 1550 • Price : ₹ 1500 • Postage : ₹ 100 • ISBN No. : 978-81-7164-086-7

For obtaining copies, please contact:

Business Manager

Directorate of Knowledge Management in Agriculture
Indian Council of Agricultural Research
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012

Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@gmail.com