

Chapter 11

Speciality fish products

Dr. Parvathy U.

Scientist, Fish Processing Division, ICAR-CIFT

Email: p.pillai2012@gmail.com

Seafood products are among the most important internationally traded food commodities as they satisfy the demands of the diverse global customers on account of its availability, accessibility, nutritional as well as quality and safety aspects. As the global demand for seafood continues, this sector is entering a new era of consumption and ready food formats. In this context, the industry is forced to have an outside of the box vision by taking advantage of rest raw material also and add value to them. Value addition is highly discussed in the food industry, mainly due to the increased opportunities it offers for earning foreign exchange. Value-added products are processed to create new forms, flavors and textures from a variety of raw ingredients. It is that extra feature of interest beyond the standard expectations. A speciality seafood product can be an innovative product, a new package, eco-labelling, a new cut, a ready-to-eat product, a formed product with multiple formats/ shapes/ dimensions/ flavour profiles. An array of innovative and diversified fish products for both domestic and export market based on a wide variety of seafood sources have been identified.

Chilled products

Chilled seafood commodities are an important and common value added item of domestic importance as well as in foreign trade. In the international seafood sector, the most prominent among this category is the sashimi/sushi grade tuna, which is raw fish fillets from tuna. It is a traditional delicacy in Japan with major species utilized being blue fin, big eye and yellow fin. For the best quality sashimi grade, tuna is maintained chilled throughout the food chain. Other important species like salmon, pomfret, shrimp, lobster etc are also used for raw consumption and hence requires proper chilling for maintaining the quality and safety. Further an array of marinated seafoods are also being marketed in chilled form. These ready to cook products are also gaining more popularity in the domestic market, especially among the urban entities.

Frozen products

Frozen products remains to be the prominent group that has high demand in the Industry. Various forms of IQF products from fish and shell fish viz., whole cooked lobster, lobster tails, lobster meat, cuttlefish fillets, squid tubes, squid rings, whole shrimp, peeled and de-veined shrimp, cooked butterfly shrimp, headless shell-on, butterfly, fan tail and round tail-on shrimp, stretched shrimp (Nobashi), skewered shrimp, shrimp head-on cooked (centre peeled), boiled clam meat and skinless and boneless fillets etc. are capturing the market. With the advent and spread of aquaculture for shrimp/prawn, in particular, individual quick freezing has become very popular. They have the advantage of facilitating harvesting during a predetermined period. This facility enables freezing them individually in the highest quality

possible. IQF products are packed in attractive moisture-proof thermoform moulded trays and stored at around -30°C .

Accelerated freeze dried products

Accelerated freeze-drying is now being increasingly used for the preservation of high value food products. It is a novel and effective approach to the food preservation and hence is fast developing into a multi-million dollar industry. Freeze drying technique involves a combination of refrigeration, vacuum and heat. In this process, the removal of water from frozen food is affected by sublimation. Initially, raw food is frozen and by employing high vacuum conditions, the ice in the food is sublimed directly into vapour. Adequate control of processing conditions contributes to satisfactory rehydration, with substantial retention of nutrient, colour, flavour, and texture characteristics. Advantages of freeze dried products are that the quality is comparable to fresh material with high retention of flavor, color, and nutritive value. Further it can be stored under ambient conditions in suitable packaging, light weight, ease of preparation as well as convenient to use. Pre-cooked ready to serve salads, instant fish soup mixes, and prawn cakes prepared using freeze drying technique were found to have good consumer acceptance. Reports suggest a storage life of more than two years for freeze dried prawns under ambient conditions. In India this technique is now applied for processing shrimp, squid rings etc. and there is immense potential for various ready-to-eat products based on fish and shellfish employing this technique.

Thermally processed ready to eat (RTE) products

Ready to eat/serve fish products are gaining wide popularity in the seafood sector on account of its delicacy as well as convenience. A broad range of products categorized under this include retorted seafood curries/masala recipes, seafood combos, seafood ethnic recipes etc. The major advantage of these speciality products is their shelf stability, which ranges from one to two years at room temperature. Retort pouches come in design variances, the most common being a 3-ply laminated material consisting of polyester/aluminium/cast polypropylene. The technology for retort pouch processing of a variety of ready to serve fish and fish products including curries from mackerel, rohu, sardine, tuna, pomfret, prawn, seer fish molly, pearl spot molly, fried mussel, fish sausage, prawn kurma, prawn manchurian, fried mussel masala etc. has been standardized and commercialized by the Institute.

Fish mince and mince-based products

Fish mince is the meat separated from fish in comminuted form and is generally free of bones, skin and other undesirable matter. When this process is encouraged in low cost, underutilized species, it adds on value to the source. Similarly processing fillets can also be effectively utilized for mince preparation. Fish mince can be used as a base material for the preparation of a an array of specialty products that have high market demand viz., fish sausage, cakes, cutlets, patties, balls, pastes etc.

Surimi and surimi based products

Surimi constitutes a wet frozen concentrate of myofibrillar proteins of fish muscle prepared by deboning, washing the fish mince and stabilizing by cryoprotectants. It serves as a convenient raw material for the preparation of various comminuted fish products like sausages, snacks, paste fishery products (kamaboko-type products) and a variety of fabricated products such as crab sticks and shrimp analogues. The purpose of using frozen surimi, rather than whole fish, is not only to cut down the processing procedure but also to ensure a standard quality supply. Surimi-based products are manufactured by grinding surimi with

salts and other ingredients followed by extrusion, fiberization or composite moulding depending upon the desired form of final product, and finally heated to get the shape, develop the texture, and pasteurize the product. The type of heat treatment used is altered to vary the flavour, texture and appearance desired in the final product. The different heat treatments include steaming, broiling, boiling, deep frying, etc.

Coated products

Coated/battered and breaded commodities are highly appreciated form of speciality products on account of their convenience, sensory appeal and nutritional attributes. The most important advantage of coating is that it increases the product bulk, thereby adding value to the finished product. On account of the increasing consumer demand, the technology has made several advancements. This technology also paves way for better utilisation of underutilized seafood resources. A wide array of seafood products can be categorized in it viz., coated fish fillet, fish portions, fish cakes, fish medallions, fish nuggets, breaded oysters and scallops, crab balls, fish balls, coated shrimp products, coated squid rings etc.

Extruded products

Extrusion processing is gaining more relevance in the food industry for restructuring starchy and proteinaceous ingredients. A wide array of extruded products can be produced by optimizing the process variables providing a great versatility for the development of cheap, high-nutritive and convenient cereal based food products. Extrusion technology provides a method to utilize fish muscle recovered from by-products, by-catch and other underutilized fish, thus adding value to the low-cost and underutilized fish and shellfish. Addition of protein rich seafoods in the extruded products fortify the commodity making them more palatable and nutritious. These products can be diversified by introducing attractive flavours and texture by optimized protocols and by innovative packages adopting advanced techniques like modified atmospheric packaging, adding to its shelf life too.

Ethnic seafood products

Ethnic seafood products are region specific ones being prepared and consumed by different people since ancient times. Most of these follow centuries-old indigenous knowledge of processing techniques like fermentation/drying/smoking etc. Globalization has boosted the demand for these traditional commodities and hence they are upgraded as speciality food products. Popularization of these ethnic foods by adopting diverse processing techniques can bring a new outlook for these commodities. A few among these include dried and cured products like dried fish, fermented seafoods, pickles, wafers/papads etc.

Fish pickle

Apart from staple foods, people like spicy adjuncts to make the food palatable and relishing. Preparation of pickles is an old art and a variety of these products are made in Indian homes. The basic principle of pickling is curing of fish by salting, acidifying by addition of vinegar and/or oil and spices. In general, pickling enhances the product shelf life to six months and more. Most of the seafoods like prawns, tuna, seer fish, etc. are ideally suitable for making pickles.

Fish wafers

Preparation of starch based dried products is an age old practice in the house holds and has wide popularity in the domestic market. These are dried, ready-to-fry-and-serve products employing carbohydrate as main base and incorporated with salt and several other

ingredients with or without spices. Being dried products, they have a shelf life of one to two years. By-catches as well as processing frame meat can be very well employed as raw material for the preparation of these dehydrated commodities.

Fermented products

Fermentation is a traditionally been used technique to preserve fresh fish, especially in tropical climates. In India, it is more common in the north eastern region. The ethnic people use their indigenous knowledge for fish preservation without using any extra chemicals. Nowadays it is used to enhance nutritive value, improve appearance and taste, destroy undesirable factors, and also to reduce the energy needed for cooking. A few among the fermented fish products include Ngari and Hentak of Manipur; Tungtap of Meghalaya; Shidal of Tripura etc.

Smoked products

Smoking is a traditional method of fish preservation which is done primarily for the unique taste and flavour. It involves a combination of drying, deposition of naturally produced chemicals resulting from thermal breakdown of wood and salting. It is also used as an intermediate step in the preservation of canned smoked fish. In advanced process, preparation of products with typical flavour extracts may be advised to reduce the process time and better texture. Typical smoked fish products of the northeast include *Gnuchi*, *suka ko maacha* etc.

Live seafood

Indian fisheries sector especially aquaculture segment is booming on account of global seafood demand. However, the sector is facing a major issue with regard to the marketing of the harvested commodity in its best quality to the consumers. Live transportation is gaining more significance in the country that constantly endeavors to discover ways to enhance the final product value. Compared to the processed ones, the consumer demand and value realization for live ones are much higher. However, for effective live shipment, a number of factors need to be considered critically for improving the survival of fish during their transportation from the point of harvest till it reaches the customer's hands. Focused research and development in this area is expected to improve the quality of seafood supply chain, facilitating the availability of prime quality seafood commodity to the consumers.

Conclusion

Recently, the global seafood market signals diversification with increased consumer demand for convenient on-the-go products with superior nutritional value and palatability. In this line, a series of innovative products like noodles, pastas, energy bars etc as well as ethnic ones with modified protocols have occupied the domestic and export markets. Further there is more focus towards utilization of underutilized fishery resources for the formulation of such products. Innovations in this sector by adoption of novel processing and packaging techniques is an continuous process and consumers are bestowed the assurance to experiment with novel products launched in the market.

Suggested Readings

1. Balachandran.K.K. 2001. Post harvest technology of fish and fish products. Daya Publishing House.

2. Devadasan.K. 2003. Value added fish and fishery products. Fishing Chimes. Vol.23(1), P-131-136.
3. Gopakumar S. 2000. Fish Processing Technology. 2000. Daya publishing house.
4. Gonçalves, A. A. and Kaiser, C. (2011). Value-added seafood products: a challenge or a necessity?. INFOFISH International, 41.
5. Parvathy, U., Binsi, P.K., Kumar, K.S., Murali, S. and Ravishankar, C.N., 2019. Live fish transportation: Technology assuring quality.
6. Venugopal.V. 2003. Value addition to Aquacultured Fishery Products. Fishing Chimes. Vol.23 (1), P-82-84.
7. Venogopal . V. and Shahidi. F. 1995. Value added products from under-utilized fish species. Critical Review in Food Science and Nutrition. Vol. 35(5), P-431-453.