Success story
of
National
Agricultural
Technology Project
on
Development of convenience foods from fish


Central Institute of Fisheries Technology
Matsyapuri P.O., Cochin 682 029, India
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Background information

Annual fish production in India has crossed the 5 million mark. Of this, nearly 30% consists of low cost fishes, which do not find favour as food fishes, nor has a ready market and hence are not properly utilized. Often most of such fish are discarded leading to the wastage of valuable and inexpensive nutritious food. Because of this wastage, they fetch very poor returns to the fishermen. This is also true of the landings from the deep sea sector.

Development of viable and appropriate technologies for utilization of this under-utilised resource is the need of the hour. The by-catch/low cost fishes will find acceptance in the domestic and overseas markets if only they are converted into various attractive value added products. Exotic Asian seafood dishes are becoming increasingly popular among the youth as well as the cyber-shopping housewives in the developed countries. We have to capitalize on this trend. In the domestic urban market also, ready-to-eat, attractively packed fish based convenience foods are already in great demand especially among working women. This project was taken up to develop technologies for production of convenience products from fish to cater domestic and export markets.

Objectives of the project

- Standardisation of processing conditions for the production of ready-to-serve fish curry processed in retortable pouch.
- Preservation of fish and fishery products using Modified Atmosphere Packaging.
- Development of extruded products.
- Popularization of the above mentioned technologies.
Technologies developed under the project

- Retort pouch processing of ready to serve fish and fish products
- Modified atmosphere packaging of fish for extending shelf life
- Extruded fish products

Ready to serve fish products in retortable pouches

- Indigenous retortable pouches were found suitable for thermal processing of fish and fish products.
- Standardisation of processing conditions and storage studies for several ready to serve fish products in retortable pouches suitable for different regions of the country were completed. The products could be kept in good condition for more than one year at ambient temperature. The products standardised are;
  - Tuna in oil
  - Seer fish moli
  - Rohu curry
  - Sardine curry
  - Punjab style fish curry
  - Kashmiri fish curry
  - Bengal fish curry
  - Oriya fish curry
  - North east fish curry
  - Goan fish curry
  - UP Mughlai fish curry
  - Amritsari fish curry
  - Fried mussel
Modified Atmosphere Packaging (MAP) of fish

Fresh fish is highly susceptible to spoilage from post mortem autolysis and microbial growth. The high ambient temperature of our country favours rapid growth of microorganisms. Presently ice and mechanical refrigeration are the most common means of retarding microbial and biochemical spoilage in freshly caught seafood during distribution and marketing. However, as ice melts it tends to contaminate fish accelerating spoilage and reduces shelf life.

Modified atmosphere packaging, a technologically viable method has been developed as a supplement to ice or mechanical refrigeration to reduce the losses and extend the storage life of fresh seafood products. In modified atmosphere packaging air is replaced with different gas mixtures to regulate microbial activity and/or retard discolouration of the products.

Modified atmospheric packaging of pearl spot, prawn, rohu and seer fish were studied. Ideal gas composition for enhancing shelf life was standardised.
Gas composition of 40% CO₂, 30% O₂ and 30% N₂ was found ideal for prawn with a shelf life of 18 days under MAP and 11 days for air (control) packs.

Gas composition of 50% CO₂ and 50% O₂ was found ideal for pearl spot with a shelf life of 30 days under MAP and 14 days for air (control) packs.

Gas composition of 70% CO₂ and 30% O₂ was found ideal for seer fish with a shelf life of 30 days under MAP and 14 days for air (control) packs.

Gas composition of 40% CO₂, 30% O₂ and 30% N₂ was found ideal for rohu with a shelf life of 28 days under MAP and 18 days for air (control) packs.

**Extruded fish products**

In recent years there is considerable interest in the development of extrusion technology for the production of convenience foods in developing countries. The extrusion technology has lot of advantages like versatility, low cost, better product quality etc. which popularized the method in the production of expanded snack foods, baby foods, ready to eat cereals etc. Processing of low value fishes with cereal flours can be a solution for the malnutrition of common people in the developing countries.

Several varieties of ready to fry extruded products incorporating fish mince and starch were standardized. Fish mince can be mixed with starch at 10% level to get products with good characteristics like shearing strength, colour, bulk density, linear expansion and increase in fish percentage above 30% affected the
quality parameters. Products prepared incorporating up to a level of 30% of fish resulted in acceptable products with good nutritional properties.

**Transfer of Technology of retort pouch processing of fish products to:**

- M/S. Saras Spices, Kizhakambalam, Kerala
- M/S. Forstar Frozen Foods, Mumbai
- M/S. Britto Exports, Chennai
- M/S. Anns House of Sweets, Palai, Kerala

**Popularisation of technologies developed is being carried out in collaboration with:**

- Marine Products Export Development Authority, Cochin
- Punjab Agricultural University, Ludhiana
- College of Fisheries, Agarthala
- Govt. Polytechnic, Goa
- Institute of Hotel Management & Catering, Goa
- NRC for Cold Water Fisheries, Bhimtal, Uttarakhand
- NBFRGR, Lucknow
Papers published:


Technical bulletins published:

1. Technical bulletin on Ready to serve Rohu curry
2. Technical bulletin on Ready to serve Seer fish moli
Published by:

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*Sponsored by:*

**National Agricultural Technology Project**
ICAR, New Delhi, 2005
Products launched in the market by adopting CIFT technology