



Preparation of Fish Pickle: A Simple Approach to Fish Preservation and Value Addition

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Abstract

Fish is cheap and nutritious, but it goes bad fast once it's caught. Farmers have no storage during peak season and there is heavy wastage due to low prices. Pickling is an inexpensive, simple solution that requires no equipment or refrigeration. Fish pickle is a pickle made from fish, salt, oil, spices and a souring agent such as vinegar, tamarind or lime. The fish is cleaned, fried and salted and then mixed with masala and the souring agent, cooked and sealed in airtight jars. Salt, frying, acidity, oil and spices all inhibit the growth of disease-causing microbes. Studies on hilsa, pangas and prawns have shown that these pickles are safe and nutritious for a few months. Pickling creates value, enabling farmers, women's self-help groups and coastal communities to earn more and waste less.

Keywords: Preservation, Pickle, Shelf life, Value addition

Introduction

Fish has always been a favourite source of animal protein because it is affordable, simple to digest and rich in essential fatty acids and micronutrients. But this same richness in moisture and protein makes fish extremely fragile once they leave the water. If it is not cooled, dried, salted or otherwise treated soon after harvest, it spoils within a day or two and the nutrients and income it could have provided are lost. In many fish-producing regions, this loss happens on a large scale during the peak fishing season, when supply is high, prices are low and farmers have no easy way to store the surplus. Preservation techniques exist precisely to solve this problem and pickling is among the simplest and most economical. Pickled fish products need no refrigeration, no complex machinery and no imported ingredients; they rely on salt, oil, spices and an acidic medium that most kitchens already have. This makes fish pickle an ideal starting point for small entrepreneurs, self-help groups and fish-farming households who want to add value to their catch rather than sell it fresh at a low seasonal price.

Why Fish Needs to be Preserved?

The protein in fresh fish is soft and easily digested. The fish itself is about three-quarters water. This composition, as useful as it is for nutrition, is also the one that spoilage bacteria and natural enzymes need to thrive in (Ali *et al.*, 2022). In warm climates, if not treated, fish will develop off-odours, discolouration and texture breakdown within hours. Simple, low-cost processing techniques such as salting, drying, smoking and pickling remain the backbone of small-scale fisheries around the globe because they slow this spoilage without the need for expensive cold-chain infrastructure. Preservation, therefore, serves two purposes at once: it protects the nutritional and economic value of the catch and it turns a highly perishable raw material into a stable food item that can be transported, stored and sold over a longer period.

Pickling

Pickling is a form of chemical preservation in which salt, sugar, vinegar or other acids are used to create an environment where spoilage organisms cannot easily survive. The method

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has been used with fish for centuries across very different food cultures, from the vinegar-and-spice cured herrings of northern Europe to the salt-and-tamarind cured fish of the Indian coast (Rao *et al.*, 1958). What all these traditions share is a reliance on two combined barriers: a low water content (achieved through salting) and a low pH (achieved through an acidic ingredient), both of which make it very difficult for bacteria, yeasts and mold to multiply. A related but distinct traditional method is fermentation, in which naturally occurring or added lactic acid bacteria lower the pH of the fish themselves; once the pH drops below about 4.5, most spoilage bacteria stop growing. Pickling achieves a similar acidic effect more quickly and predictably by adding vinegar or a tart fruit pulp directly, rather than waiting for fermentation to occur.

Required Ingredients for Fish Pickles

1. Cleaned fresh fish
2. Vegetable or mustard oil
3. Salt
4. Vinegar or other acidic ingredient like tamarind pulp or lime juice.
5. Spices such as turmeric and chilli powder.
6. Paste of garlic and ginger.
7. Storage in sterilised airtight glass or food-grade plastic jars.

Fish Pickle Preparation Method

1. **Clean and Cut:** Clean fish well, remove the scales, gills and entrails and cut the fish into small, even pieces. It is important at this stage to have clean handling because the initial microbial load of the raw fish generally decides the keeping quality of the pickle later on.
2. **Salting:** Rub salt on the pieces of fish and leave for a short while. Salting draws the water out to the surface and begins to reduce the water activity of the flesh, the first step to making the fish undesirable to bacteria.
3. **Frying:** Fry pieces of salted fish in oil, shallow or deep-fry, until golden and firm. Frying drives off most of the remaining internal moisture and creates a light protective crust and adds flavour.
4. **Making the Masala:** Heat oil in a separate pan and add mustard seeds, fenugreek, turmeric, chilli powder, garlic and ginger paste and cook gently until the spices release their aroma. This masala base carries much of the pickle's antimicrobial character and taste. Stir so that every piece is coated evenly.
5. **Mixing:** Mix the masala and fried fish pieces. With the leftover salt, add vinegar or tamarind pulp.
6. **Reduce:** The mixture will be cooked on low heat as the oil separates and rises to the surface. As the oil comes to the surface, it shows a positive result, meaning the mixture has been reduced enough.
7. **Bottled and Cooled:** Before transferring to an airtight and sterilised jar, let the pickle cool completely. An oil film should be present over the top of fish pieces and it eliminates air and moisture.

8. **Storage:** To keep the pickle in an acceptable condition upto 1 year, keep the pickle jar away from sunlight and should be stored in an airtight container (Shahriar *et al.*, 2025).

Importance of Every Component in Fish Preservation

1. **Salting:** Draws water out of the fish tissue and also out of any bacterial cells that might be present, reducing the water activity to a level that most spoilage organisms cannot survive.
2. **Frying Removes Moisture.** The layer of oil on top of the stored pickle slows oxidation and prevents many aerobic spoilage bacteria from getting at the fish.
3. **Vinegar or Acidic Pulp:** Lowers the pH of the mixture, making it acidic, an environment in which most food-spoilage bacteria grow very slowly or not at all.
4. **Spices:** The traditional spices are turmeric, garlic, fenugreek and chilli. They also have natural antimicrobial compounds, which increase the effect of salt and acid and add flavour.

Nutritional Changes and Shelf-Life

Fish pickle gradually loses moisture and protein with time but continues to be nutritious for months. Correspondingly, prawn pickle prepared with mustard oil was found to remain in excellent condition for at least six months, whether at room temperature or in a refrigerator, with chilling yielding only a negligible improvement (Tanuja *et al.*, 2022). A canned item is a kind of shelf-stable product, but fish pickle is not in the same way. But if sterile condition maintained throughout preparation and storage, the pickle retains its quality, such as sensory quality and nutritional quality, for several months.

Value-Added Product in the form of Fish Pickle

Pickling is one of the methods of preservation and value addition. High-value products can be prepared from low-value fishes and non-traditional species such as silver carp are also used (Hani *et al.*, 2022). It is also a low-investment opportunity suitable for small-scale farmers, coastal communities and women's self-help groups. The raw material is available locally and the equipment required is also fairly basic, as the finished product is competitively priced in the market. Fish pickle making is a good option to increase household income and also to reduce post-harvest losses.

Conclusion

Spoilage is one of the major issues in the fisheries sector. To avoid spoilage, fish pickle preparation solves this issue. To reduce water activity and retard microbial growth, some combinations, such as frying, salting and spices, play a key role and the finished product can also be stored for up to several months without altering nutritional and sensory quality. Several studies conducted by scientists on several species, such as pangas, hilsa and shrimp, show that if the prepared products are stored well, they retain their nutritional quality and enhance shelf life. The perishable commodity enhances food and income sources.

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