Consumer demand for convenience food products that are tasty, wholesome, safe, easy to cook and convenient, but are not over-processed or laden with additives is increasing globally. This is more so in the case of ready to cook flesh foods like fish, which are not easily preserved in fresh condition. Rohu (*Labeo rohita*), a freshwater Indian major carp was chosen for this study, as it is widely available and cultivated. The concept of hurdle technology was proposed to be utilized to prepare a convenience ready to cook fish product that can be stored under normal refrigeration conditions with a reasonable shelf-life, which is minimally processed.

After establishing the microflora of the fish as well as its handling and processing environment, a protocol for the efficacy of sanitization on handling and processing environment was worked out. Fish steaks were prepared initially by standardizing a sanitizer for the removal of surface microflora of the fish, process area and equipment. Two sanitizers, *viz.*, Sodium hypochlorite and Chlorine dioxide were tested at concentrations of 30 and 50ppm to treat fish steaks prepared from washed and dressed fish which were stored at 4-6 and 1-2°C. Chlorine dioxide on the handling and processing environment at 100ppm and on the dressed fish steaks at 30ppm was best suited to reduce the initial microbial load of fish. A storage temperature of 1-2°C, combined with the optimized sanitization schedule of 30ppm Chlorine dioxide was found to have good control over mesophilic and psychrophilic bacterial count with minimal changes observed in the biochemical parameters and acceptable scores up to 8-10d compared to hypochlorite.

Salting, an essential step in culinary preparation, was used as the next hurdle in the processing. Salt itself was found to be contaminated with bacteria of spreader type colonies, which could be controlled better by treatment with chlorine dioxide than heating. Refrigerated storage at 1-2°C of directly salted fish steaks at 2% showed better control over the microbial counts and objective spoilage indices than wet salting in 2, 15 or 20% brines. Although acceptable up to 10d, salting led to blackening of the steaks. Six acidulant
additives in the form of organic acids as well as acid salts were tested for their ability to extend shelf life of sanitized fish steaks stored at 1-2°C. Of the acidulants tested Sodium benzoate (0.1M) was found to control best the rise in pH, bacterial counts and had good organoleptic scores and sensory characters till 10-14d. Other sodium salts tested viz, Sodium lactate and Sodium acetate were not found to be better than Sodium benzoate in their preservative ability. The minimum concentration of sodium benzoate necessary for shelf-life extension when used with sanitization alone was found to be 0.05M.

Further reduced levels of sodium benzoate (0.005M) and salt (1%) used along with a combination of antioxidants, butylated hydroxy anisole (BHA) and butylated hydroxyl toluene (BHT) at 0.001% and chelator (citric acid), was found to overcome the changes in the functional properties of the treated steaks. A suitable optimized spice combination was developed as the next hurdle, for a ready to cook product in combination with the previously optimized combination of sanitizer (30 ppm ClO₂), acidulant/preservative (Sodium benzoate), antioxidant (BHAVBHT) and chelator (Citric acid) which recorded the microbial load only on the 10/14th day of storage. The spice mixture showed significantly reduced fluctuations in biochemical parameters with sensory acceptability till 14-16d.

The final step included the evaluation of different packaging materials. Polypropylene showed better visibility and storage quality of steaks under refrigeration at 1-2°C. SDS-PAGE Gel electrophoresis of water soluble (WSP) and salt soluble protein (SSP) fractions of steaks showed no appreciable difference in the patterns till 8d of refrigerated storage in the electropherogram. But essentially, there was no difference in the electropherograms of control and treated steaks in SSP fractions too.