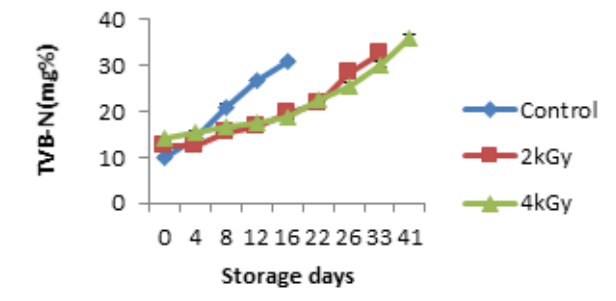
tage is that the electronbeam irradiation can be applied in a bidirectional manner in which the irradiation can come into contact with the food product from both top and bottom of the sample which results in reduction of microorganisms on food product. Further, the time required for the EBI treatment is very short.

Freshwater aquaculture sector has been found to have are markable growth in the past few years with more and more emerging freshwater species. Among the freshwater fishes, tilapia (*Oreochromis niloticus*) is one of the most traded food fishes in the domestic as well as export market. In the present study, the effects of electron beam irradiation on the quality of tilapia fish chunk were studied. Fresh tilapia (*Oreochromis niloticus*) were purchased from retail fish market at Vashi, Navi Mumbai and brought to laboratory in iced condition. Fish were cleaned with potable water, chunks (3-4cm thickness) were made and vacuum packed. Samples were divided for 3 treatments viz, first as control, second and third lot was given treatment of 2.0 kGy, 4.0 kGy dose of electron beam irradiation, respectively. Electron beam irradiation of fish chunks were done by a linear EB RF accelerator (Energy 5 MeV, beam power 40kW, EB tech., BRIT, Mumbai). All the samples were kept in chiller (2°C) for further studies

Biochemical parameters including proximate composition, pH, total volatile base nitrogen (TVB-N), peroxide value (PV) and thiobarbituric acid (TBA) value were analyzed. Results showed an increasing trend in pH, TVB-N, PV, TBA values during storage. TBARS values were within the acceptable limit in all the samples during storage. Peroxide value of control was within limit during storage. However, PV has crossed the acceptable limit on 26th day for 2.0 kGy and 4.0 kGy irradiated fish chunks. It was observed that TVB-N value was lower in irradiated fish chunk than control. TVB-N value of control had 30.8 mg% on 16th day of storage. However, 2.0 kGy and, 4.0 kGy irradiated sample reached the maximum acceptability level on 30th day (32.50 mg%) and, 41st day (35.8 mg%), respectively (Fig.1). Total plate count was lower in irradiated sample than control (Fig.2). There is a significant ($p<0.05$) reduction in pseudomonas and *Brochothrix thermosphacta* count in the irradiated sample. Based on the microbial and sensory analysis, control had a shelf life up to 16thday. However, electron beam irradiated fish chunks had an extended shelf life of 33-41days with respect to dose level .



TEXTURAL AND FUNCTIONAL MODIFICATION OF FISH MINCE USING HIGH PRESSURE PROCESSING

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Changing life style and the awareness about the nutritious and healthy diet has led to the necessity of bringing more fresh and natural ready to eat foods in the market. The demand for

convenient foods with superior quality and nutritionally healthier have led to the introduction of "minimal preservation and processing technologies".Conventional processing operations are designed to focus on the vital thermal treatments, which assure the consumer's required safety and shelf life of the product. But, the volumetric generation of heat energy inside the food during thermal processing had direct implication on the freshness and quality of the food. So the advent of non-thermal technologies like high pressure processing for microbial inactivation has been extended towards the development of new/ improved products with more natural freshness and taste through textural and functional modification.

The effect of high pressure processing on textural and functional modification was studied on pink perch mince against the conventional heat treatment. The fish mince was taken, packed in casings and subjected to high pressures of 200, 400 and 600 MPa for 10 min and compared against cooked and uncooked mince.

Plate 1: Treated mince in casings

The treated mince was then subjected to different textural and functional quality analysis like gel strength, TPA and viscosity, free and reactive SH groups, hydrophobicity, FTIR and microbial analysis.

The pressure treated mince was analyzed for gel strength before and after heating against the cooked mince.

Gel strength increased with increase in pressure, however reheating reversed the effect on gel strength. On reheating cooked and 200MPa treated gels also exhibited similar gel strength. So the high pressure up to 200 MPa pressures on fish mince did not affect the gel strength and the mince can be utilized for further modification during product development without losing its functionality. HPP prior to heating considerably enhanced the thermal gelation capacity of proteins in a comminuted meat.

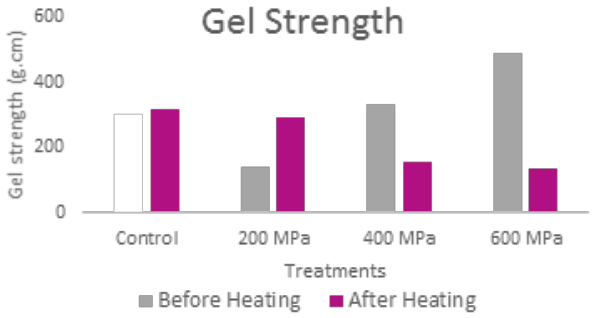

Fig 1. Changes in gel strength values of treated mince before and after heating

Textural properties of the treated mince before and after heating were analyzed using texture profile analysis. Hardness increased with increase in pressure. The 400 MPa treated samples had similar hardness as that of cooked mince and a higher hardness value was noticed at 600 MPa. The 200 MPa treated mince showed the lowest hardness value.

The study can be concluded as the pressure below 400 MPa on fish mince, most changes were reversible and loss in functionality of protein was least observed, but above 400 MPa, pressure had similar effect as that of cooking. Changes in protein conformation were minimum at 200 MPa. Above 400 MPa pressure can bring out significant alteration in textural and functional properties and pressure above 600 MPa leads to complete denaturation and loss of functionality.