



मत्स्य प्रौद्योगिकी समाचार Fish Technology Newsletter

Vol. XXIV / No. 3, July - September 2013



Contents

News from the Research Front	1
Publications	9
Training Programmes	10
Exhibitions	11
Outreach Programmes	11
Workshops and Seminars	12
Radio Talks	23
Celebrations	23
Personnel News	25
Personalia	28

News from the Research Front

Customised Nutritional-mix from Collagen Peptide

Fish scale and bone contain protein, mainly in the form of collagen and minerals like calcium (Ca), phosphorus (P) and magnesium (Mg) along with traces of sodium (Na) and sulphur (S). Collagen contains relatively high amounts of amino acids such as glycine, proline and hydroxyproline. Hydrolysis of collagen molecules yields peptides with bioactive, functional and sensory properties that are better than those of native proteins from which they are obtained. Bioactive collagen peptides have great potential in pharmaceutical, nutraceutical and food processing industries. Now a days, collagen peptide is being incorporated in to a wide array of products, including protein bars, cereal bars, protein drinks, smoothies etc. Apart from their nutritional benefits, collagen peptides exhibit a wide range of physiological functions including antihypertensive, antioxidative, opioid agonistic, anticancer immunomodulatory, antimicrobial, prebiotic, mineral binding, antithrombotic and hypocholesterolemic effects. Collagen peptide as a food supplement may improve low bone density in people under malnutrition and those suffering from degenerative joint diseases.

The waste generated from fish processing is around 50% of the starting material by weight, and is more costly to dispose. On an average, 30% of fish processing waste accounts for the protein collagen, which is mainly seen associated with scales, bone, skin, and connective tissue of the animals. It has been observed that collagen peptide from fish processing discards can be absorbed to blood stream much better than those

Editorial Committee

Dr. P.T. Lakshmanan, HOD, B&N	: Chairman
Dr. Leela Edwin, HOD, FT	: Member
Dr. K.V. Lalitha, HOD, MFB	: Member
Dr. T.V. Sankar, HOD, QAM	: Member
Dr. S. Balasubramaniam, HOD, EIS	: Member
Dr. C.N. Ravishankar, HOD, FP & HOD I/C, Engg.	: Member
Dr. A.R.S. Menon, Technical Officer (T9)	: Member Secretary



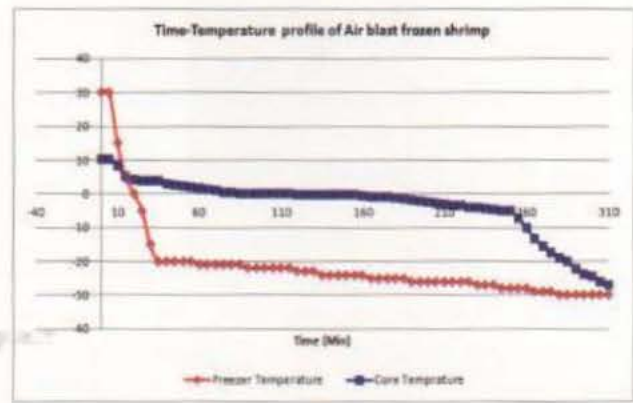
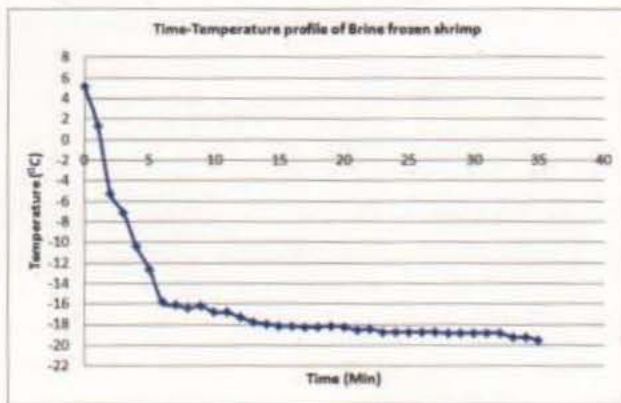
Nutritional mix prepared with collagen peptide from fish scales

केन्द्रीय मत्स्यकी प्रौद्योगिकी संस्थान

सिफ्ट जंक्शन, मत्स्यपुरी पी. ओ., कोचिन-682 029

Central Institute of Fisheries Technology

CIFT Junction, Matsyapuri P.O., Cochin - 682 029



Time-Temperature profile of brine and air blast frozen Tiger shrimp



Fresh and brine frozen Tiger shrimp

temperatures. A comparative study was conducted at CIFT to investigate the effect of air blast freezing and brine freezing methods on the quality changes of Tiger shrimp (*Peneaus monodon*).

Freshly harvested Tiger shrimps (L = 16 ± 2cm, w= 50 ± 3g each) were frozen by blast freezing (2 kg each) at -30 °C. For brine freezing, shrimps were passed over the conveyor belt for brine solution treatment prepared by mixing food grade sodium chloride (21%), sugar (5.3%) and water (73.7%) in the brine mixing tank. Upon freezing, the shrimps were frozen stored maintaining a temperature of -18 °C. Freezing time was significantly less for brine frozen shrimps (35 min.) compared to air blast frozen shrimps (5 h). Freezing loss and thawing loss was higher for air blast frozen shrimp (2.24 and 0.86% respectively) compared to brine frozen samples (1.84 and 0.38% respectively). Total mesophilic and total psychrotrophic

counts of brine frozen shrimps were lower than air blast frozen shrimps. Brine freezing also lowered total enterobacteriaceae counts. Salt content (NaCl) of brine frozen shrimp was higher (1.62%) compared to air blast frozen sample (0.38%). Peroxide value was observed higher for brine frozen samples whereas free fatty acids and TBA value was higher for blast frozen prawn. The results indicated that brine freezing reduces the freezing time considerably and improves the microbial quality of shrimp whereas salt content and lipid oxidation was more compared to air blast frozen samples. Sensorily, samples frozen using brine was rated better. The brine freezing treatment has led to an increase in NaCl content in the white muscle. This increased salt content could be responsible for the higher lipid oxidation and the lower lipid hydrolysis development. NaCl has been reported to act as pro-oxidant by enhancement of the pro-oxidant effect of chelatable iron ions widely present in fish muscle. Since long shelf-life time is highly essential for commercializing brine freezing method for fishery products, the employment of other protective treatments such as glazing, vacuum packaging, modified atmosphere packaging and natural antioxidant application can be used as hurdle to prevent or to inhibit lipid oxidation and to retain sensory and nutritional properties.

Dr. C.O. Mohan, S. Remya, V. Renuka, Dr. G.K. Sivaraman, Dr. R. Badonia, Dr. C.N. Ravishankar* and Dr. T.K. Srinivasa Gopal*

Veraval Research Centre of CIFT
Fish Processing Division, CIFT, Cochin*

Faecal Indicators in Water Samples of Navi Mumbai Local Fish Markets

Faecal indicators are the microorganisms that normally exist in the intestine of warm blooded animals and the presence of these microorganisms in water indicates that

the water sources are contaminated with faecal materials. In Navi Mumbai local fish retail markets, fishes are handled unhygienically and the water used for cleaning of fishes





are not of potable quality. Moreover, the retail fish markets in Navi Mumbai is an unorganized sector, which usually find a market place with poultry, vegetables and other food commodities together. Most of the retail markets are not having a raised platform for keeping the fish and the sheds are not properly covered. The floor is quite often occupied by stray dogs particularly during the night hours. Hence, there is a high possibility of faecal contamination in these unhygienic markets. In this context, a study was conducted to determine the faecal indicator level of the water from the Navi Mumbai local fish markets.

A total of 28 water samples from the local fish market, Vashi, Navi Mumbai was analyzed for Aerobic Plate Count (APC) and faecal indicators such as *E. coli*, faecal Streptococci (FS) and Sulphite reducing Clostridia (SRC) as per standard protocol and results were analyzed based on Pearson Correlation Coefficients.

Microbiological levels of all 28 samples were more than the recommended limits. The average values of APC, *E. coli*, FS and SRC were 483.89, 53.21, 49.36/ml and 13.96/100ml respectively. The result indicates the poor hygienic condition of the local fish markets. The correlation coefficient of the faecal indicators were analyzed based on the Pearson Correlation Coefficients, and very high correlation was found between *E. coli* and faecal

Streptococci (FS) i.e., 0.77. Next higher level of correlation was found between APC and *E. coli* i.e., 0.47.

Correlation between the faecal indicators present in water samples

Faecal indicators	Correlation Coefficient
TPC and <i>E. coli</i>	0.47
TPC and faecal Streptococci	0.34
TPC and Sulphite reducing Clostridia	0.36
<i>E. coli</i> and faecal Streptococci	0.77
<i>E. coli</i> and Sulphite reducing Clostridia	0.22
Faecal Streptococci and Sulphite reducing Clostridia	0.05

The higher level of faecal indicators in the water samples of the local fish markets is a sign of very poor hygienic condition which symbolize threats to human health. The correlation between *E. coli* and faecal Streptococci was very high, suggesting that FS may be a suitable alternative for *E. coli* in water sample analysis. SRC shows least correlation when compared with other indicators since this bacteria indicates the remote contamination, not a recent contamination.

Dr. S. Vishnuvinayagam, Dr. P.K. Binsi and P. Viji
Mumbai Research Centre of CIFT

Publications

Research Papers

1. Biji, K.R., Saumya Teresa Chacko, Yathavamoorthi, Y., Ravishankar, C.N., Bindu, J. and Suseela Mathew (2013) - Optimization of process parameters for ready-to-serve bread spread from Blue swimmer crab *Portunus pelagicus* in tin-free steel cans, *Fish. Technol.*, **50(3)**: 237-244.
2. Binsi, P.K., George Ninan, Zynudheen, A.A., Neethu, R., Ronda, V. and Ravishankar, C.N. (2013) - Compositional and chill storage characteristics of microwave blanched sutchi catfish (*Pangasianodon hypophthalmus*) fillets, *Intl. J. Food Sci. & Technol.*, doi:10.1111/ijfs.12308.
3. Binsi, P.K., Viji, P., Vishnuvinayagam, S., George Ninan, Sangeetha G., Triveni, A. and Ravishankar, C.N. (2013) - Microbiological and shelf life characteristics of eviscerated and vacuum packed
4. fresh water catfish (*Ompok pabda*) during chill storage, *J. Food Sci. & Technol.*, doi: 10.1007/s13197-0133-1165-x.
5. Gavin H. Tilstone, Aneesh A. Lotleker, Peter I. Miller, Muhammed Ashraf, P., Sreenivasa Kumar, T., Suresh, T., Raghavan, B.R. and Harilal B. Menon (2013) - Assessment of MODIS-Aqua Chlorophyll-a algorithms in coastal and shelf waters of the eastern Arabian sea, *Continental Shelf Res.*, **65**: 14-28.
6. Murthy, L.N., Mohan, C.O., Ravishankar, C.N. and Badonia, R. (2013) - Biochemical quality and heavy metal content of fish meat and squid meat produced in Veraval, Gujarat, *Indian J. Fish.*, **60(3)**: 113-117.
7. Rajeswari, G., Raghu Prakash, R. and Sreedhar, U. (2013) - Ring seines operated off North Andhra Pradesh coast, *Fish. Technol.*, **50(3)**: 225-230.

