Development of Fish Soup Cube using Yellow Fin Tuna Off-Cuts

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Introduction

Fish are principal source of protein for world population and play a vital role in meeting basic nutritional and livelihood needs. Fish products are comparable to meat and dairy products in nutritional quality. Today even more people turn to fish as healthy alternative to red meat.

Sri Lanka has a large potential for marine fish production as it is surrounded by an Exclusive Economic oceanic area. A recent study has showed that average recovery percentage of expensive cuts of yellow fin tuna (*Thunnus albacares*) from a medium scale processing factory is approximately 50%. The remaining inexpensive off cuts has low market value. Tuna trimmings can be purchased at Rs. 200.00 per kg. The profit margin of food processing companies can be increased while converting these off cuts into value added products.

Fish soup cubes are now an established item on the world food market but not available in local market. A soup is a flavorful and nutritious liquid food served at the beginning of a meal or a snack. Instance soup cubes can save a good deal of time and effort. This study was conducted to develop fish soup cube using tuna off-cuts. The present study was carried out with an aim of producing a soup cube by adding value to low valued off cuts of yellow fin tuna.

Methodology

The experiment was carried out at the Global Sea Food (pvt) Ltd, Badalgama and the laboratory analysis were carried out at the Uva Wellassa University. Initially, a survey was carried out at the Global Sea Food (pvt) Ltd and usable off cuts, were identified considering wholesale prices and consumer prices. Subsequent to the preliminary survey selected off-cuts were analyzed for its nutritional quality, dry matter, ash content, crude protein content and crude fat content following AOAC standard methods (AOAC, 1995).

The preliminary trials were conducted first to find out the best combination of fish powder, salt and spices by changing ratios. These experiments were done in order to develop the solubility, texture and flavor of the soup cube. Once the satisfactory product was developed, the sensory analysis was carried out for the samples made using the final formula.

In order to find out the best recipe which gives better sensory qualities to the soup cube, another three samples (T1, T2 and T3) were prepared by changing fish powder and salt combination in small quantities in the finalized recipe (i.e. fish powder 20%: salt 30%, fish

powder 22%: salt 28%, fish powder 25%:salt 25%, while keeping the other ingredients constant. Then, in order to select the best percentage combination of fish powder and salt sensory evaluation was carried out with 30 untrained panelists of Global Sea Food (pvt) Ltd. The sensory analysis was done using the Friedman nonparametric statistical test. Proximate analysis (AOAC, 1995) was conducted for all three treatments. Proximate analysis for the data measurement is a combination of crude protein, crude fiber, crude fat, moisture, total solid and ash. Shelf life of the fish soup cube was determined by testing pH and water holding capacity. For this, samples were taken at regular intervals weekly for one and half month storage period. Finally data were analyzed using MINITAB software.

Results and Discussion

Yellow fin tuna (*Thunnus albacares*) trimmings contain a 20 ppm level of histamine. The highest estimated median value and highest ranks were obtained for the treatment (T_3) having 20% of tuna trimmings and 30% of salt for; Appearance, Colour, Odour, Fish Taste, and Overall Acceptability. However, the score of T_3 for texture was low compared to the S_1, the control sample. S_1 gives highest scores for aroma, texture, solubility and overall acceptability.

Water Holding Capacity is basically related with the myofibrilla protein of the fish. WHC increased in the first six weeks. There were no differences between the pH values during the storage period. The fish soup cube samples were vacuum packed using an aluminum foil. Aluminum foil acts as a barrier for moisture and there are possibilities of reducing moisture penetration. Cubes are stored in a dry cool place. The proximate composition of the selected sample which was having 20% of tuna trimmings and 30% of salt; 3.267% of moisture, 16.483% of crude fat, 6.697% of crude protein, 32.067% of ash and 1.7.% of crude fiber.

The commercially available chicken cube showed higher scores for aroma, colour, texture, and solubility for its sensory attributes. Newly developed product shows highest score for fish taste.

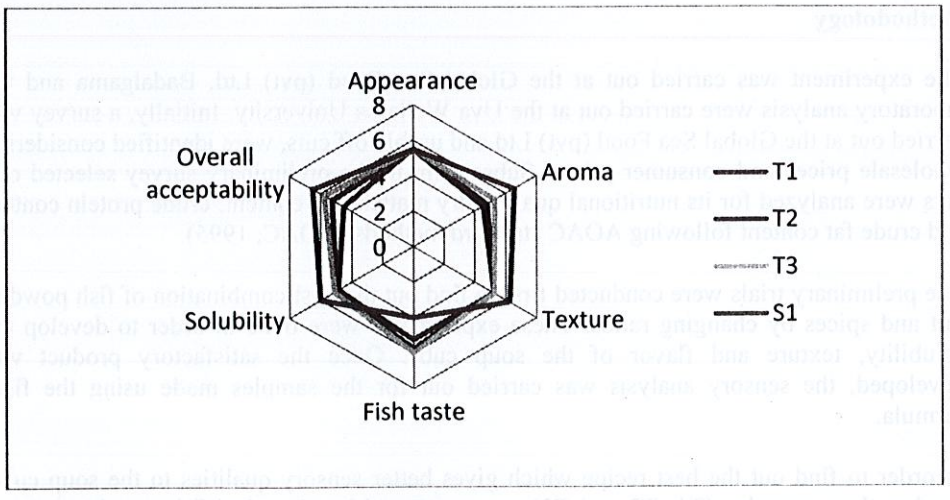

Figure 1. Web diagram for sensory evaluation

Conclusion

The best combination of tuna trimmings to salt was 20%: 30% on the weight basis. Shelf life of the tuna soup cube was more than 6 weeks with dry place respect to microbiological analysis and the physicochemical analysis. Cost for the final product with treatment T_3, 20% dry fish powder and 30% salt powder were SL Rs.4.10 per soup cube.

References

A.O.A.C. 1995. Official method of analysis, 16th ed. Arlington, Association of Official Analytical Chemists, Washington.