Effect of legume flour extenders on the quality of Tilapia fish nuggets

S.S.G. Silva[1], S. Ariyawansha[2], S.B.N. Ahmed[2], K.A.P. Manamperi[1], and C.V.L. Jayasinghe[1*]

[1]*Department of Food Science and Technology, Faculty of Livestock Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila, 60170, Sri Lanka.*
[2]*Institute of Post-Harvest Technology, National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka.*

Nile tilapia (*Oreochromis niloticus*) is one of the widely cultured fresh water fish in Sri Lanka. However, limited recognition for tilapia in the market is due to the less availability, muddy flavour, inconvenience in preparation and low flesh yield (<50%). This study attempted to develop a tilapia fish nugget with non-meat protein extender in order to improve the nutritional, sensory and physical qualities of the product and reduce the cost for raw material. Lentil, chickpea and cowpea flour were used as non-meat protein extenders. To prepare the Tilapia nuggets, 70% mince, 15% extender, 5% spice mixture and other ingredients (8%), were selected as the best composition (rank sum 39). Nuggets prepared with lentil, chickpea and cowpea flour extenders were evaluated for cooking yield, shrinkage percentage, moisture retention ability and bio-chemical properties. Results indicated that incorporation of legume flour significantly ($P<0.05$) increased the protein content of nuggets. The significantly highest ($P<0.05$) cooking yield (78.89%) was observed in nuggets with cowpea flour. Cowpea flour extender proved its good textural properties i.e. exhibited the highest moisture retention ability (34.15%), the lowest diameter shrinkage (6.42%) and the lowest water holding capacity (63.5%). Shelf life of the fish nugget was evaluated at-18°C storage for three months period. Free fatty acid values (<5% as oleic acid), peroxide value (<8 meq peroxide/1000 g), total volatile-basic nitrogen (<35 mg/100 g) of fish nuggets prepared with all three legume extenders were within the acceptable