Effects of Cooking on Omega 3 Content of *Sardinella longiceps* Emphasizing an Innovative Method to Elevate Omega 3 Intake

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***Abstract*- Most of the small pelagic fish like *Sardinella longiceps* (Indian oil Sardine) are considered as best sources of Omega 3 Polyunsaturated fatty acids (PUFA). Due to their law cost and availability throughout the year, Sardines are popular and consumed often by people, especially in the developing countries. This study was designed to determine the effects of cooking on Omega 3 polyunsaturated fatty acids of *Sardinella longiceps* by comparing GC/MS fatty acid profiles of raw, boiled and fried fish; and then utilizing the fish in an innovative product (dry soup mix) in order to elevate the omega 3 intake that could be obtained from *Sardinella longiceps*. Omega 3 PUFA content of raw fish was 21.54% (of total fatty acids). With boiling it has decreased to 14.23% and when fried in coconut oil, it was 2.83%. Since average per capita fish consumption of Sri Lanka is 30.5 g, frying, which can be identified as the most popular cooking method of Sardines like small fish (due to lots of tiny bones present with lesser flesh), cannot provide the recommended minimum daily "EPA" Omega 3 intake (0.22 g per person) when taken alone without any other Omega 3 sources. As a solution for this issue, an instant soup powder which was incorporated with fish powder derived from, and fish oil extracted from *Sardinella longiceps* was developed containing 9.31% of Omega 3 PUFA, which is significantly higher than that of fried fish. It can provide 0.6 g of EPA and 1.9 g of DHA per serving which is higher than the recommended minimum daily intake.**

***Index terms*- *Sardinella longiceps*, Omega-3 PUFA, EPA, DHA**

I.INTRODUCTION

Sardinella longiceps or the Indian oil sardine (Yak Salaya in Sinhalese) is a commercially important small pelagic resource in the Indo-Pacific region [1]. Fish is the well-known source of all nutrients except carbohydrates and vitamin C. Fish owns an invaluable nutritional quality and serves as a health-food for the affluent world with the fish oils which are rich in polyunsaturated fatty acids (PUFAs), especially ω-3 PUFAs [2]. These fish oils are extracted from fatty or the oily fish (i.e: small pelagic fish like Herring, *Sardinella* sp. and larger pelagic fish like mackerel, salmon, etc) which are carrying oil in their flesh and the belly cavity around the gut. They contain up to 30% oil, although it can vary among the different species and different individuals of the same species [3]. These fish oils are recognized as predominant dietary sources of omega-3 PUFA, which consist mainly of Eicosapentaenoic acid(EPA C20:5) and Docosahexaenoic acid (DHA C22:6) [4]. Alpha linolenic acid (ALA) is an essential fatty acid and EPA and DHA are metabolized from ALA, increasing the chain length and degree of unsaturation by adding extra double bonds to the carboxyl group [5]. But only a minor quantity of the beneficial ω-3 PUFAs (EPA and DHA) are synthesized in humans, since excess dietary Omega-6 fatty acids associated with a high consumption of vegetable oils may compete with omega-3 for metabolization in the body [6]. Regular consumption of omega 3 rich diets with appropriate content of EPA and DHA can prevent hypertension, cardiovascular diseases, type 2 diabetes, rheumatoid arthritis, Crohn's disease and reduce the risk of Dementia, Alzheimer's diseases, obesity, thrombosis, lung disease, cancer including colon, breast and prostate and some other diseases. And also omega 3 PUFAs can improve the development and functioning of the brain, retina and testis [4],[7],[8]. Unlike in meat, fish fat has minimal content of saturated fatty acids.