# Air frying Vs oil frying of farmed tilapia (*Oreochromis mossambicus*) steaks

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Consumers are becoming more conscious about the healthy products which have resulted in the quest for newer processing methods. Although oil fried fish products are highly preferred by the consumers it affects the nutritional value considerably. Hence, air frying was evaluated as an alternative process for oil frying in this study. For this, two temperatures (180 and 200 °C) were considered for both air frying and oil frying. Frying duration of 3 and 6 min. were tested for oil fried tilapia at 200 and 180 °C, respectively. In air frying, time duration of 15 and 20 min. were tested at 200 °C, whereas 20 and 25 min. were used at 180 °C based on sensory appearance of the final product. The effect of different frying temperature and duration on the fatty acid profile, fat absorption, weight loss, shrinkage and instrumental colour was investigated. Weight loss was maximum in air fried steaks (50-61.88%) compared to oil fried samples (41.7-45.1%) (Fig. 1). Oil frying resulted in greatest shrinkage reaching a value of 39.90 and 33.68% for 180 and 200 °C, respectively. For air frying shrinkage ranged between 22.58-31.54%. Instrumental colour values of both oil fried and air fried samples were significantly different ($P<0.05$) from fresh samples. The results indicated that, air fried samples were lighter, less yellow compared to oil fried samples. Among the saturated fatty acids, the content of palmitic acid decreased significantly in the oil fried samples whereas linoleic acid increased compared to air fried samples (Fig 2). Loss of palmitic acid ranged between 61-66% for oil fried samples compared to 2.9-5.6% for air fried samples. Significant loss of Ω-3 fatty acids and increase in Ω-6 fatty acids were observed for oil fried samples compared to air fried samples (Fig 3). Level of linoleic acid increased to 5.2-5.6 times in oil fried samples compared to fresh tilapia. Whereas, in air fried samples the increase in linoleic acid was only 1.07 - 1.20 times. Loss of arachidonic acid was to the tune of 68-71% for oil fried tilapia steaks compared to an increase of 0.9-13.8% for air fried samples. Loss of EPA and DHA was only 1.5-10% and 0.4-

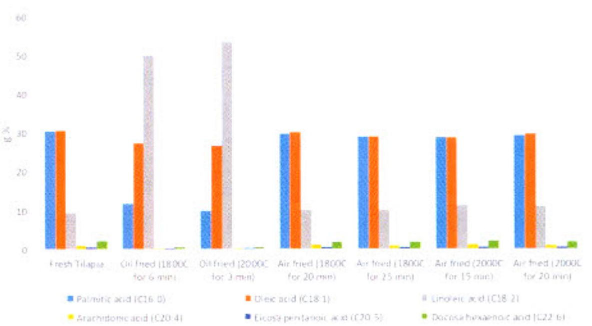

Fig 2. Fatty acid profile of oil and air fried tilapia steaks

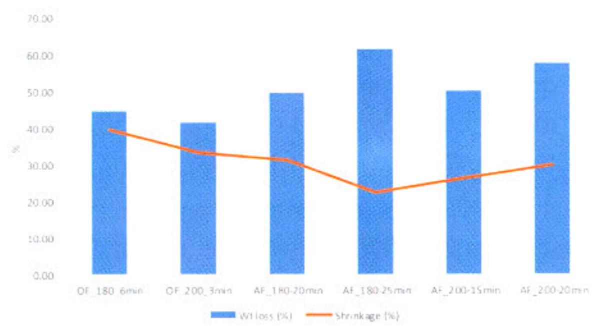


Fig 1. Weight loss and shrinkage of oil and air fried tilapia steaks


Fig 3. Changes in Ω-3 and Ω-6 fatty acids of oil and air fried tilapia steaks

8.4%, respectively in air fried samples compared to 43-54% and 71-74%, respectively for oil fried samples. PUFA/SFA ratio increased in oil fried samples whereas it did not differ in air fried samples. A better n3/n6 ratio was observed for air fried sample compared to oil fried sample. Air frying offers advantages that food products can be fried without using oil, preserving its natural colour, appearance and taste. Use of air frying helps in improving the health status of consumers and also improves the useful fatty acid profile of fish like tilapia.

# Synthesis and characterization of seaweed extract based bioplastic reinforced with silver nano particles

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Majority of the modern-day packaging materials are composed of fossil-based polymers which are hazardous for the environment. Biopolymers provides an excellent alternative to petroleum-derived polymers as they are environmental friendly, biodegradable, naturally available, renewable and comparatively cheaper. The importance of the biopolymer packaging material increases as they not only act as barriers to oxygen and carbon dioxide, but also provide a platform for incorporating a wide range of additives such as, antimicrobial agents, antifungal compounds, colourants and other desirable nutrients. In the recent past, biopolymers from different natural resources such as cellulose, starch, lignin, soy protein, whey protein, wheat gluten, etc. have been extensively tried for development of ecofriendly biodegradable packaging materials. Though biopolymer-based films can be prepared from proteins, carbohydrates and lipids, carbohydrate-based films are the most preferred ones, because of their colloidal properties and better film forming ability. This has created a new avenue for seaweed polysaccharides such as agar, carrageenan, alginates etc. Agar is a hydrophilic colloidal polysaccharide extracted from red algae (Rhodophyceae) and is composed of alternate repeating unit of D-galactose and 3, 6 anhydro-β-galactopyranose. Agar is known for its excellent gel forming ability, biocompatibility, thermo-plasticity and hence, it has been tested as an alternative source for the petroleum-based plastic packaging materials. Due to the biocompatibility and blending properties of agar, various materials such as cellulose, carrageenan, nano clay, banana powder, *Aloe vera* extract, metallic nano particles etc. have been blended with it to improve its mechanical and functional properties. The nano reinforcement of the bioplastic packaging films with antibacterial function is believed to be a promising intervention to maintain the food quality and extend the shelf life. In the present study, agar film reinforced with silver nano particles was prepared using a solution casting method and their properties were characterized. The FT-IR spectra (Fig. 1) reveals typical agaran peaks, the peak around 2925 $cm^{-1}$ was associated with C-H stretching vibration. The peak near 1638 $cm^{-1}$ corresponds to the stretching vibration of the conjugated peptide bond formation by amine and acetone groups. The bands at 1073 and 1045 $cm^{-1}$ indicates C-O stretching group of 3, 6-anhydro-β-galactopyranose and the peak at 892 $cm^{-1}$ was assigned to C-H stretching vibration of β-galactose. However, there were no changes in the position of peaks after the addition of AgNPs in the film matrix, which indicates that there was no chemical interactions formed between polymer matrix and AgNPs, though it could have made physical integration. Scanning electron microscopy (SEM) (Fig. 2) revealed the proper integration and uniform distribution of nano particles in film