

Physicochemical, Biological and Organoleptic Properties of the Tomato Incorporated Tilapia Fish Paste

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Tilapia mossambica and *Tilapia nilotica* are often used inland fish for fresh and dried consumption in Sri Lanka. But it is more popular among dry zone people than in other parts of the country. Due to the growing popularity of fast food, people hardly have time to spend in the kitchen. The easiest alternative for them is instant food or junk food. In these fast food outlets, tomato-based products are the most common condiments. In this context, replacing tomato-based products with fish paste can provide a nutritionally dense, non-vegan diet with value addition. The present study aimed to characterize the ready-to-serve fish paste with “Zero-waste processing” concept. Therefore, three different fish paste formulas were developed, and based on sensory analysis; the most preferred sample was made with 26.48% fish muscle, 5.20% fish bone, 0.60% fish skin, 15% tomato pulp, 3.5% vinegar, and 0.02% cinnamon extract. The fish paste has high crude protein, crude fat, carbohydrate, ash, vitamin-A, vitamin-C, phosphorus, calcium, sodium, and salt as 22.93%, 4.05%, 11.67%, 5.80%, 2.00%, 2.07%, 4.43 mg/mL, 1.97%, 0.65%, and 1.79% respectively; and ω_6/ω_3 ratio is almost 2:1. In addition, viscosity, spreadability, pH, titratable acidity, total solid, water activity, and color values of L^* , a^* , and b^* were 174 mPa.s, 314.29 mm², 4.89, 0.12%, 44.95%, 0.94, 34.97, 19.95, and 17.03 respectively. The fish paste has shown improved hardness, gumminess, and adhesiveness; similar cohesiveness and lower resilience than tomato ketchup, and values were 113.65 g, 40.60 g, 4.50 mJ, 0.78, and 0.01 respectively. The glass jars and polypropylene containers were the best packaging, showing higher antioxidant properties as 1.21 GAE mg/mL of total phenolic content and 27.08 ppm of DPPH-IC₅₀ value. During the 45 days of refrigerated storage, coliforms were not detected, and total viable count, yeast and mold count were also within the acceptable range without adding any preservatives. In conclusion, formulated ready-to-serve fish paste has shown high nutritional and functional properties to commercial tomato ketchup with similar consistency.

Keywords: Fish Paste, Tilapia Fish, Tomato Ketchup, ω_3 Fatty Acids, Functional Properties