

Effect of Chitosan Nanoparticles as Active Coating on Chemical Quality and Oil Uptake of Fish Fingers

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Abstract

The effect of different concentrations of chitosan and chitosan nanoparticles as active coating compared to commercial edible coating on chemical quality attributes of fish fingers during frozen storage at -18°C was investigated. Results illustrated that, uncoated fish fingers (T1) and that coated with commercial edible coating (T2) had significantly higher total volatile nitrogen (TVN), trimethylamine (TMAN), thiobarbituric acid (TBA) in comparison with fish fingers coated with either chitosan or chitosan nanoparticles. Moreover, T1 and T2 had a shelf life of 5 months, while, chitosan treatments had longer shelf life up to 6 months according to trimethylamine (TMAN) value which recorded by Egyptian standard. Also, data showed that, chitosan nanoparticles as active coating introduce the most effective improvement for quality attributes of fish fingers during frozen storage at -18°C. The influence of edible coating in reducing oil uptake during frying of fish fingers was investigated.

Key words: Chitosan, Nanoparticles, Chemical quality, Fish fingers, shelf life, Thixotropic effect, oil uptake

Introduction

In recent years, the increase of civilization or socio economic factors like the increasing numbers of working women of the population have led to direct consumer's preference to ready-to-eat foods. These foods (cakes, crackers, burgers, fish fingers, marinated products, etc.) made from fish or other seafood are the products which are mostly preferred by consumers around the world and various studies on production and quality stability of these ready-to-eat foods have been done (Cakli *et al.* 2005). Edible films and coatings offer extra advantages such as edibility, biocompatibility, esthetic appearance, barrier to gasses properties, non-toxicity, non-polluting and its low cost In addition, biofilms and coatings, by themselves or acting as carriers of foods additives (i.e.: antioxidants, antimicrobials), have been particularly considered in food preservation due to their ability to extend the shelf life. In this field chitosan and chitosan nanoparticules can used effectively (Entsar, et al. 2012)

Fish fingers produced from minced fish flesh as a battered and breaded product, are commonly stored and marketed in the frozen state.