Role of Slat in Processing Salted and Fermented Fish (MOMONI)

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Summary

Most naturally occurring foods possess some amounts of antioxidants to prevent lipid oxidation by atmospheric oxygen, however the levels of naturally existing antioxidants in foods are not adequate to overcome the oxidising effects of some applied processing and storage conditions. Previous studies on 'momoni', a Ghanaian fermented fish product, which is processed by fermentation with salt at room temperature, and then sun drying, showed a sudden increase in TBA, POV values, and a decrease in the amounts of n-3 fatty acids particularly at these mentioned stages of processing. In this experiment, both synthetic (Butylatedhydroxyanisol:BHA, Butylatedhydroxytoluene: BHT, tert-butylhydroquinone:TBHQ) and a mixture of natural antioxidants(α-, γ-,and δ-tocopherol) were seperately applied to the same batch of Japanese mackerel (*Trachurus japonicus*) before the processing conditions were carried out, in momoni production. The effect of using an oxygen absorber on the control sample was also studied during storage. The initial and residual concentrations of antioxidants were measured and their effects in preventing oxidation, evaluated.

Moisture contents of samples decreased during processing and storage. TL contents increased(as is basis) during processing and storage. TBA contents of the samples increased during processing and storage. At the end of processing TBHQ had the lowest TBA content followed by BHA < BHT < Tocopherol and control sample, in that order. The sample packaged with oxygen absorber, had a lower TBA value than the control sample during storage. POV values increased up till the end of processing, very little difference was observed during storage. Fatty acid analysis showed that there was less change in the concentration of 22:6(n-3) in most of the antioxidant incorporated samples at the end of processing than the control sample. However a decrease in the percentage of 22:6(n-3) was observed in all samples during storage. During storage, the percentage polyenoic fatty acids was higher in the oxygen absorber sample than the control sample. Estimated initial concentrations(mg/kg sample; as is basis) of the antioxidants in the raw fish after immersion were as follows: BHA – 54.8, BHT – 45.6 and TBHQ – 32.0. Mixed tocopherol sample; α-toc 6.0, γ-toc 3.6, δ-toc 4.1. – toc concentration in the control raw sample was 2.6. Concentrations of TBHQ, α- and γ-tocopherol were almost depleted in samples at the end of processing. The TBHQ sample showed the least oxidation by TBA, POV and fatty acid results, at the end of processing, where the TBHQ concentration had decreased to less than 5mg/kg flesh. At the end 2 month storage however, TBHQ sample had the highest TBA value.

The TBHQ sample was the fastest acting antioxidant in suppressing lipid oxidation in fish during processing, however the formation of red patches on the fish samples, especially around the regions of the opercullum, will affect product marketability. Although the concentration of BHA in the fish samples were higher during storage, TBA values show that oxidation occurred, combination with use oxygen absorber during storage could help overcome the problem of lipid oxidation.