

**EFFECTS OF NATURAL ANTIOXIDANTS ON SENSORY,
CHEMICAL AND MICROBIOLOGICAL QUALITIES OF FISH BALL
(*SCOMBER SCOMBER*) DURING FROZEN STORAGE (-18 °C)**

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It is well known that oxidation of the lipid of fish muscle is a major cause of deterioration of fatty fish due to the high degree of unsaturation in fish lipids. Lipid oxidation has a detrimental effect on the quality of fish, as it leads to the development of off-odors and off-flavors. The present study was conducted to control lipid oxidation by natural antioxidant extracts. The objective of this study was to investigate the effect of antioxidant extracts (rosemary, thymus, basil) on shelf life of fish ball made from mackerel (*Scombrus scombrus*), stored at frozen storage (-18°C) in terms of sensory (raw and cooked), biochemical (thiobarbituric acid (TBA), total volatile basic nitrogen (TVB-N), peroxide value (PV) and free fatty acids (FFA) and microbiological analyses (total viable count (TVC)). The results indicated that the control received lower panel scores than other groups. Treatment with antioxidants significantly ($p<0.05$) decreased the values of chemical parameters throughout the storage period. Bacterial growth was inhibited by the use of antioxidant extracts. Based on the results, it can be recommended to treat fish ball with antioxidants especially rosemary and thymus. This prevents the development of oxidative rancidity, extending the shelf life of the products.

Keywords: Fish ball, natural antioxidant, freezing; quality parameter, mackerel

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