

Freshness identification of marketable frigate tuna (*Auxis thazard*) using physical and chemical parameters under market storage conditions

T.K. Walpola¹, P.C.S. Dias¹, J.D.M. Senevirathna¹ and N.P.P. Liyanage¹

¹Department of Animal Science, Uva Wellassa University of Sri Lanka

Identification of freshness of fish in the market is crucial for marine food fish industry in Sri Lanka. Chemical and physical qualities of fish are changed in storage condition and affected on the freshness level in fish muscle. This study was focused to examine chronological changes of physical and chemical parameters of frigate tuna to assess the freshness under the normal storage condition in the marketplace. Fish samples were collected from the commercial catch of Valaichchena harbor and stored under -18°C of freezing condition, which provided the normal market condition according to the findings of questionnaire survey. Five fish samples were kept at room temperature ($\sim 25^{\circ}\text{C}$) for 6 hrs in each day and pH value, alteration of water holding capacity, fat content, protein level and quality index of general appearance of fish species were tested daily after six hours of period for one week. Reference points of each parameter were suggested based on the pH changes of five replicates as pH act as key indicator on quality deterioration. The quality index of general appearance was ranged at minimum of zero (fresh) - maximum of 20 (spoiled). During the one week of storage period with the condition applied in the marketplace, pH value, water holding capacity, protein and fat content of frigate tuna were reduced significantly ($p < 0.05$). Average pH value of frigate tuna was changed significantly at the 4th day (5.69 ± 0.045) ($p < 0.05$), hence the 3rd storage day was considered as the reference point of quality deterioration of fish. At the 3rd day, water holding capacity, fat, protein content and quality index of general appearance were 72%, 0.8 c/o, 20% and 6.2 respectively. Fish appearance was highly changed at the 6th day of the period having 15.6 index value. This study recommends avoiding consumption of frigate tuna after three days in normal market storage condition and web based consumer guide would be useful to identify freshness of fish.

Keywords: Fish Quality, Fish Marketing, Consumer Guide, Quality deterioration, Fish storage