Validating Torrymeter by chemical, microbiological and organoleptic methods using *Katsuwonus pelamis*, *Decapterus russelli* and *Lethrinus nebulosus*

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Fish is a major protein source consumed by Sri Lankans. Best keeping quality or freshness retains the nutritional quality of fish and it is essential as a marketing tool. Freshness destroys mainly due to poor handling practices, inappropriate storage conditions, and physiological changes like rigor-mortis. The freshness of fish can be determined by microbiological, chemical, organoleptic and rapid sensing instruments. Traditional methods were improved with the knowledge leading to chemical and microbial analysis and technological innovations initiated sensor instruments. The present study was carried out for validation of Torrymeter as a quick, easy and non-destructive method of fish freshness determination in Sri Lankan context. Although Torrymeter is a sensor tool that can measure fish freshness quickly no studies have been carried out in Sri Lanka about its confirmation. Torrymeter readings were compared with chemical, microbiological and organoleptic fish freshness evaluation methods. Skipjack tuna (*Katsuwonus pelamis*), Indian Scad (*Decapterus russelli*) and Spangled emperor (*Lethrinus nebulosus*) were obtained from local fish markets and kept in chill condition for seven days in ice. Obtained Torrymeter measurements (Model 14-10949) for the fish samples were compared with Total plate count (TPC), Total Volatile Base Nitrogen content(TVB-N) and Organoleptic Quality Index Method (OQIM) values of the same.

Torrymeter, TPC, TVB-N, and OQIM indicate accurate freshness for all species separately. Chi-square test of Analysis of variance for *Lethrinus nebulosus* showed a correlation coefficient with TPC, TVBN, and OQIM in 0.4576, 0.8129, and 0.8783 that corresponds 85.7%, 85.7% and 85.7% equality with Torrymeter respectively. In *Decapterus russelli* it was obtained as 85.7% (TPC), 96.2% (TVBN) and 85.7% (OQIM). *Katsuwonus pelamis* showed poor correlation 0.1968 (TPC), 0.3557 (TVBN) and 0.3154 (OQIM) that corresponds with 1%, 2.4% and 2.9% respectively for the same with Torrymeter values. The reason would be the fishes obtained from multi-day boats and testing started for fishes which have already spent certain days after catching. The study confirmed that use of Torrymeter as a quick, easy and non-destructive method of fish freshness determination can be done in Sri Lankan context.

Keywords: Fish, Freshness, QIM, Torrymeter, TVBN