

## USE OF THE TORRYMETER TO ASSESS QUALITY OF MALAYSIAN FISH

by

Z. Merican, A. Kamari and R. Abdullah  
MARDI, Serdang  
Selangor, Malaysia

*Abstract*

The paper gives a background to the various methods of quality evaluation that have been used in Malaysia. These methods are compared with the Torrymeter and some positive correlations were found between organoleptic assessment and Torrymeter readings. The Torrymeter was found to be more sensitive than visual scoring when the fish were relatively fresh and un-iced. The Torrymeter should find a wide use within the fish marketing system in Malaysia.

## INTRODUCTION

At present fish in Malaysia are not subject to any quality inspection until they reach the processor or consumer. One of the major problems faced by extension workers is to introduce the concept of quality to the fishermen and the consumer. Efforts to improve and maintain the quality of the catch often fail for a variety of reasons:

The fishermen do not benefit from their extra efforts to maintain good quality and consumers have to pay more for the fish. The fishing industry is also very traditional and any modernization will lead to increased costs.

An improvement in fish quality would result from the liberal use of ice. Once the fishermen accept this idea and benefit financially from the use of ice then it will be easier to introduce other improvements such as fish holds and fish-box design.

The most acceptable quality index to determine freshness for the fishermen and the laymen is the use of visual indices. This, however, is very subjective and an objective method of measuring fish quality is needed. Various quality control indices have been used to measure the freshness of fish but no one method has been found which is applicable to all species. Several chemical procedures are available but they often require destructive sampling and are either slow or impractical for use by the laymen.

A simple and reliable method of quality assessment is required to permit the implementation of differential pricing in the marketing of fish. Differential pricing will promote improved handling practices since better quality fish will fetch better prices and improved handling may prove to be economical. The newly introduced Torrymeter is a rapid and nondestructive means of measuring fish quality. Unfortunately, it responds differently with different species. An investigation into the use of the Torrymeter on commercial Malaysian species is therefore required to determine the potential use for this instrument.

## MATERIALS

The fish were bought at landing points, wholesale and retail markets. Some samples were kept in ice while others were left at ambient temperatures. Torrymeter readings and visual assessments of quality were made at intervals until the samples were rated as no longer acceptable for human consumption.

The species used were:

Kembong (*Rastrelliger kanagurta*)  
Gelama (*Johnius pseudociaerna soldado*)  
Parang (*Chirocentrus dorab*)  
Tongkol (*Kishinoella tonggol*; *Euthynnus alleteratus*)  
Merah (*Pristipomoides typus*)  
Kerisi bali (*Pristipomoides typus*)  
Lidah or sebelah (*Cynoglossus lingua*)  
Sardine or tamban sisek (*Sardinella fimbriata*)

RESULTS

The Torrymeter was able to monitor and detect changes effectively in samples that were fresh. The readings on iced fish seemed to be erratic when compared with un-iced fish. It was found that the Torrymeter readings were not reliable when the fish had deteriorated. The scores for some species were very erratic indicating that the Torrymeter was not responding as expected (Figures 1-4).

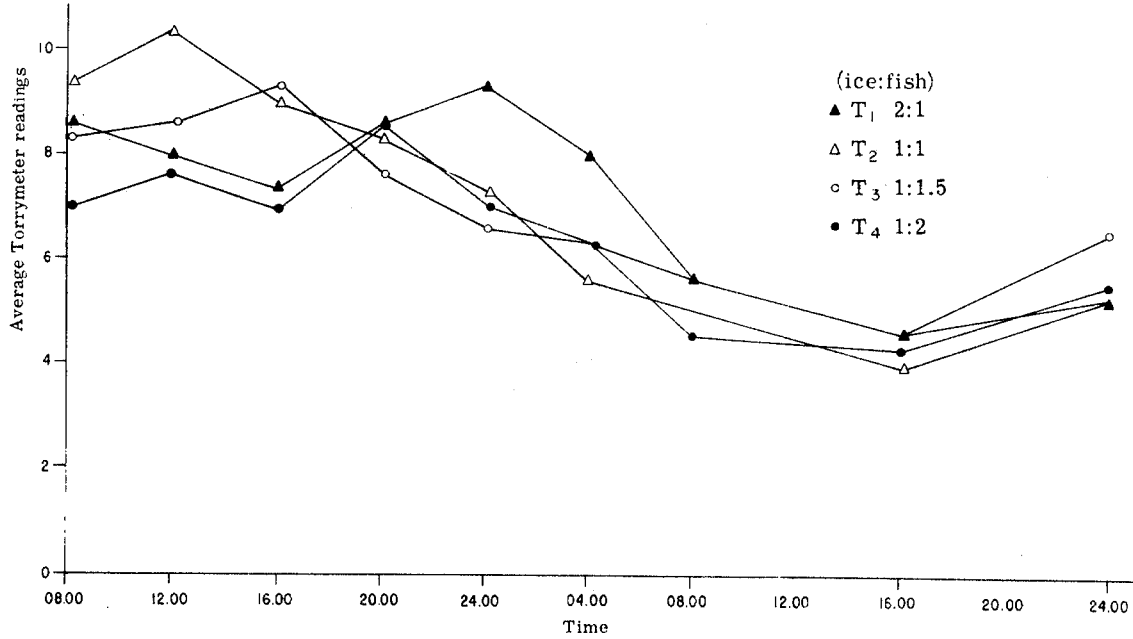


Fig. 1A - Torrymeter readings of iced ikan merah

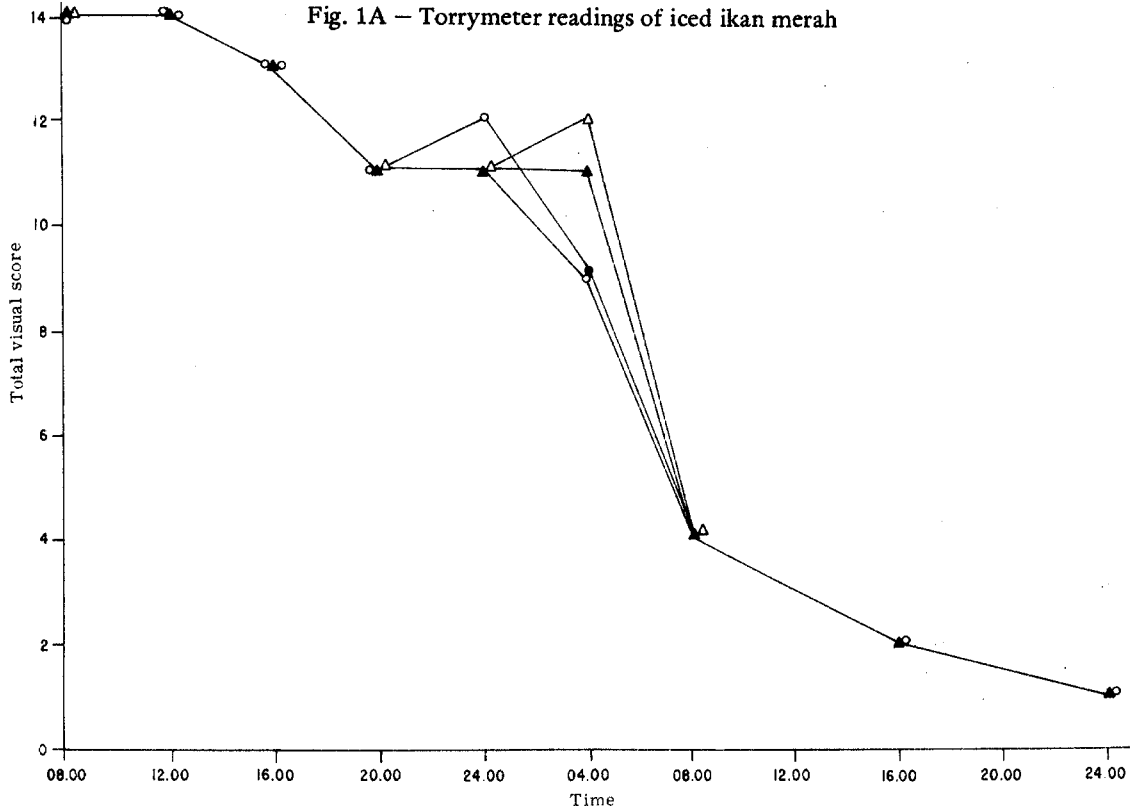


Fig. 1B - Visual score of iced ikan merah

For un-iced samples, six species were monitored and of the six only one (ikan tongkol) showed erratic response. It was noted that different species gave different scores for the same degree of freshness. This can be seen from the range in scores made by visual (12-15) as compared to the Torrymeter (5-13) when the fish were first purchased (Figure 5).

CONCLUSION

Although different fish respond differently to the Torrymeter, a pattern can be formed for the majority of species. The most important criterion in this case is that it is a quick reference method to establish freshness for the layman, fisherman, fishmonger and research worker. More surveys would have to be carried out to establish norms for each variety of Malaysian fish.

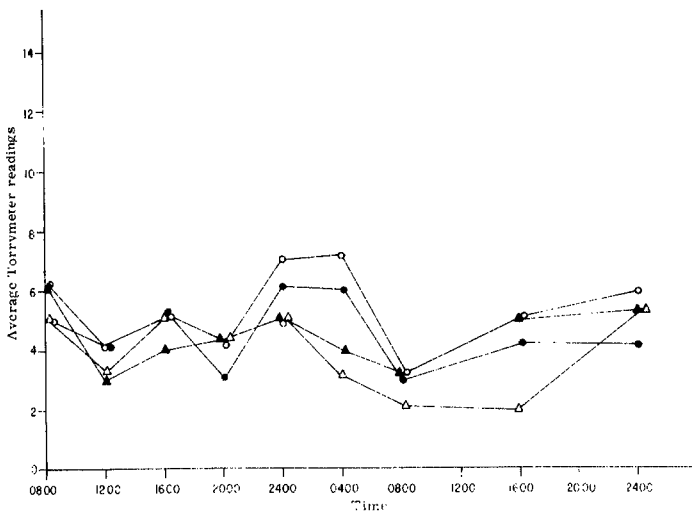


Fig. 2A -- Torrymeter readings of iced ikan tuna

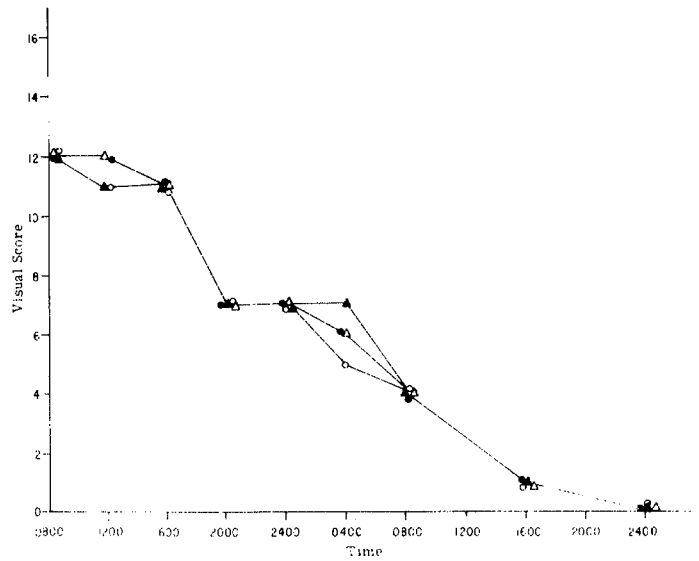


Fig. 2B -- Visual score of iced ikan tuna

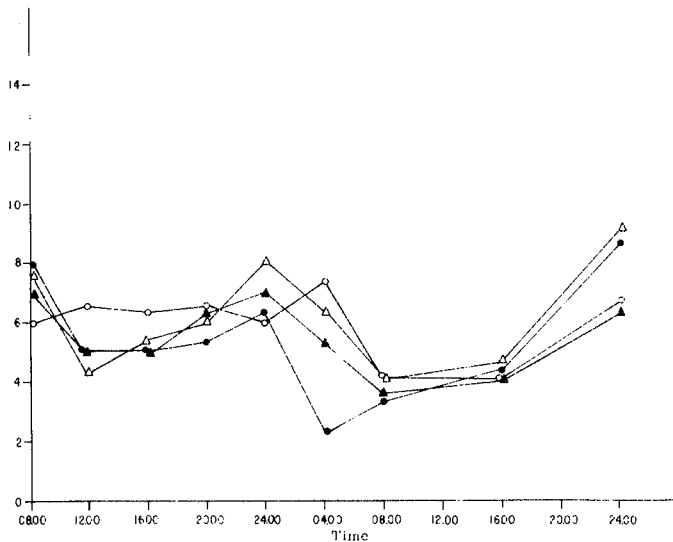


Fig. 3A -- Torrymeter readings of iced ikan sardine

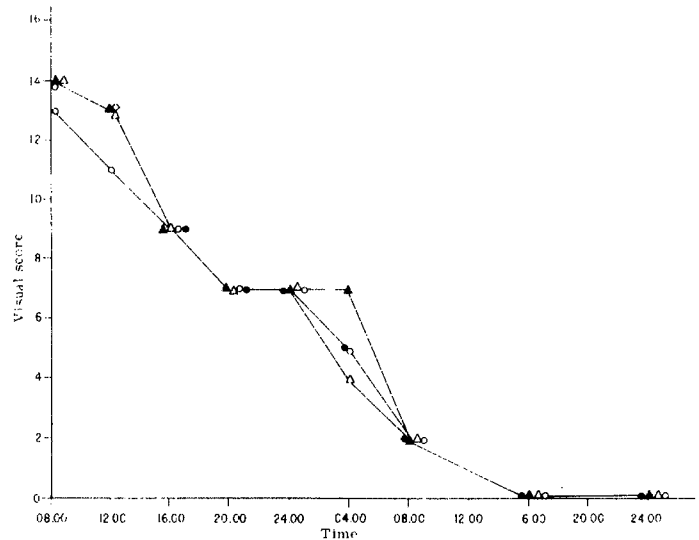


Fig. 3B -- Visual score of iced ikan sardine

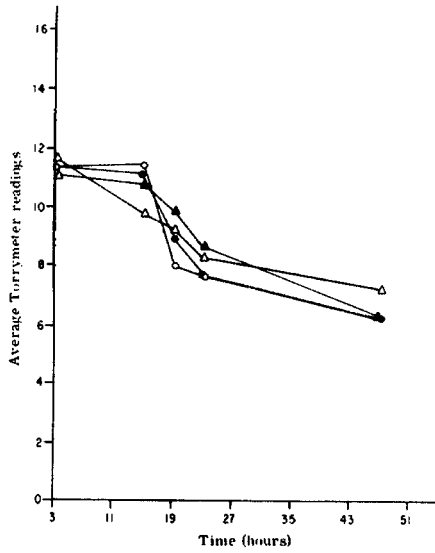


Fig. 4A – Torrymeter readings of iced ikan kerisi bali

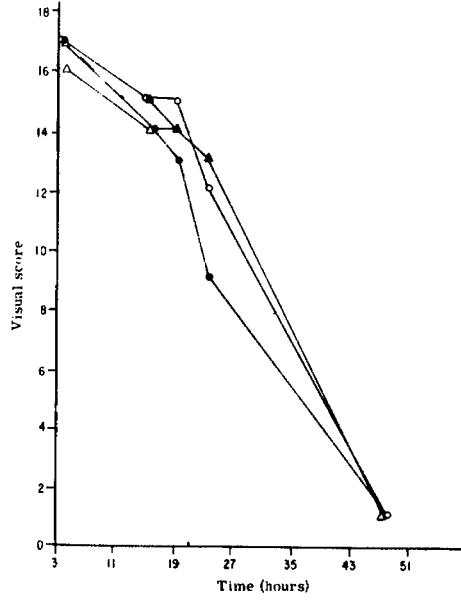


Fig. 4B - Visual score of iced ikan kerisi bali

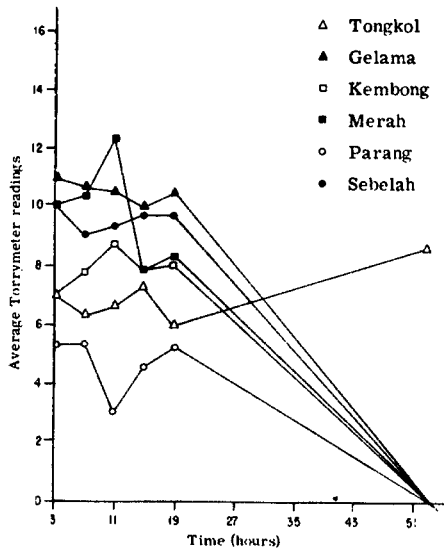


Fig 5A – Torrymeter readings of uniced fish (6 species)

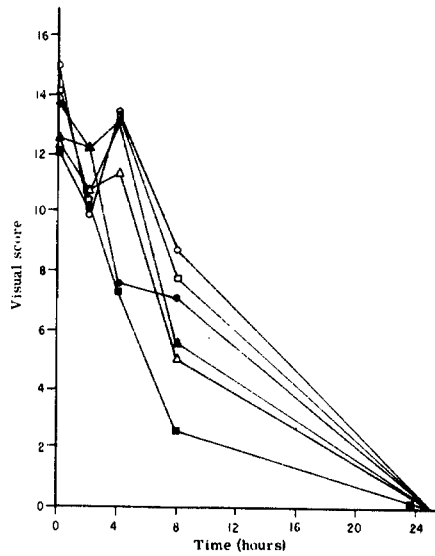


Fig. 5B – Visual score of uniced fish (6 species)