Title Assessment of European cuttlefish (*Sepia officinalis*, L.) nutritional value and freshness under ice storage using a developed Quality Index Method (QIM) and biochemical methods

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Abstract

The aim of this study was to determine the nutritional value of adult commercial cuttlefish, to develop a Quality Index Method (QIM) scheme, and to evaluate the application of some biochemical methods commonly used for freshness assessment of fish under ice storage. Additionally, shelf-life was to be determined based on both QIM and suitable biochemical methods. The nutritional value of the cuttlefish mantle in the first 24 h and after 13 days was determined. Captured cuttlefish was composed (g/100 g) by 16.60 ± 0.10 g protein, 0.09 ± 0.01 g fat, 79.55 ± 0.14 g moisture and 1.39 ± 0.03 g of ash. After 13 days of ice storage, cuttlefish was composed (g/100 g) of 11.90 ± 0.28 g protein, 0.17 ± 0.09 g fat, 87.04 ± 0.13 g moisture and 0.52 ± 0.01 g of ash. Differences ($p < 0.001$) were found in protein, ash and moisture but not in fat ($p > 0.05$). These results seem to indicate that there is impregnation of the iced water into the mantle tissue promoting protein leaching with the melting ice. TVB-N and TMA-N displayed a similar increasing tendency, peaking beyond EEC regulations proposed maximum between the 9th and 10th days. The developed QIM scheme for cuttlefish was composed of 29 demerit points, divided into 4 attributes and 13 parameters. The calculated quality index (QI) evolved linearly with storage time in ice (QI = 2.68 × days in ice − 0.61, $R^2 = 0.9866$). Storage time could be estimated with an accuracy of ± 1 day, if five cuttlefish from each sample were included in the QIM assessment. The shelf-life was determined as 8 ± 1 days by both type of methods (QIM and biochemical). However, the suitability of some biochemical methods to assess freshness need to be more thoroughly researched.