

## Investigation of the Quality Properties and Nutritional Values of Four Fish Species from Lake Qaroun, Egypt

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**Abstract:** The objective of the current study were to investigate the proximate, quality criteria, amino acids, fatty acids and major minerals composition in edible part of four commercially well-known fish species from Lake Qarun ; *Tilapia zillii*, *Solea vulgaris*, *Mugil cephalus* and *Metapenaeus stebbing* to determine and compare their quality and nutritional values. According to the results of this study, moisture ranged from 74.85 to 78.80%, protein from 17.70 to 20.11%, fat from 1.57% to 4.48%, ash from 1.33 to 1.70% and energy value was ranged from 68.05 to 117.68 kcal/100g fish muscles. *Met. stebbing* had a high ratio of moisture; *M. cephalus* a highest ( $P \leq 0.05$ ) of fat and energy values whereas, *T. zillii* had a high ratio of protein content. Quality criteria; TVB-N, TMA-N, pH and TBC values were much lower than acceptable limits. Regarding amino acids; all investigated fish species had better protein quality as indicated by high of total essential amino acids (EAA), essential amino acids index (EAAI), and biological value (B.V.%), however, *Tilapia zillii* showed the high protein quality followed by, *Solea vulgaris*, *Mugil cephalus* and *Metapenaeus stebbing*. Fatty acid compositions ranged from 26.31% to 43.65% saturated (SFA), 28.75% to 35.45% monounsaturated (MUFAs), 26.45% to 38.42% polyunsaturated acids (PUFAs) of the total fatty acids.  $\omega 3/\omega 6$  PUFA and PUFA/SFA ratios ranged from 2,13 to 2.70 and 0.63 to 1.46, respectively. *M. cephalus* and *Met. stebbing* preferred as very good sources of  $\omega$ -3 fatty acids; Eicosapentaenoic acid (EPA) Docosahexaenoic acid (EPA) and high in  $\omega 3/\omega 6$  PUFA and PUFA/SFA ratios followed by *S. vulgaris* and *T. zillii*, respectively. However, *T. zillii* and *S. vulgaris* were good source of SFA. Major minerals; potassium (K), phosphorus (P), calcium (Ca), sodium (Na) and magnesium (Mg) ranged from 280 to 560, 355 to 445, 120 to 185, 48 to 120 and 22 to 75 mg/100g fish muscle, respectively. *Met. stebbing* was the highest ( $P \leq 0.05$ ) in concentrations of phosphorus, potassium and sodium minerals, whereas *M. cephalus* highest in calcium and *S. vulgaris* highest in magnesium concentrations. These results can be used as useful references for consumers in order to choose fish based on their quality and nutritional contents.

**Keywords:** Lake Qarun fish; proximate; Quality Criteria; Amino Acids; Fatty Acids; Major Minerals.