

Utilization of Fayoum Fisheries by Products in the Production of Fish Meal High Nutritional Quality and Microbiological Safety

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Abstract: This study was carried out to utilize of fish by products from different Fayoum fisheries to produce of Fayoum fisheries waste meal (FFWM). As well as planning for the production of this fish meal on the large-scale from fish wastes and large & small fish untapped in human consumption. This fish meal can be use for feed animals, poultry and fish in Fayoum governorate instead of imported fish meal, in addition to reducing environmental pollution. The produced FFWM was high-quality low-cost and high microbiological safety as confirmed by the chemical analysis (chemical composition, amino acids, fatty acids and minerals) and microbiological aspects (total bacterial count, thermophilic bacteria, salmonella and yeast & mould) that carried out. The obtained results indicated that the produced fish meal was represented about 20.5% from fish by products used in processing. FFWM contains a high level of protein (67.90%) and moderate quantity of fat (8.70%) and minerals (15.30 %), low number of total bacterial count (0.45×10^3) and thermophilic bacteria (0.013×10^3). Pathogenic bacteria (salmonella) and yeast & mould not detected. FFWM have better protein quality as indicated by the increase of essential amino acids (EAA); lysine (8.32 g/100g protein), leucine (6.20 g/100g protein), methionine (4.85 g/100g protein) and valine (4.20 g/100g protein), EAAI essential amino acids index (76.71 g/100g protein) and (B.V. %) biological value (71.88%). Fatty acid compositions of FFWM; (26.68%) saturated fatty acids (SFA), (34.00%) monounsaturated (MUFAs), (37.07%) polyunsaturated fatty acids (PUFAs); oleic acid was the highest value (22.30) of all detected fatty acids. The predominant omega-3 fatty acids are (DHA) docosahexaenoic acid (19.60 % of total fatty acids)and (EPA) eicosapentaenoic acid (12.28 % of total fatty acids), $\omega 3/ \omega 6$ and PUFA/SFA ratios were high in FFWM indicated to the high of nutritional quality. Moreover, FFWM contains the moderate quantity of essential macro and micro minerals as recorded by many researchers; Macro minerals quantity was calcium (26.50 g/kg), phosphorus (23.85 g/kg), magnesium (2.20 g/kg), potassium (8.45 g/kg) and sodium (11.20 g/kg), the micro minerals quantity were iron (218.60 mg/kg), manganese (5.50 mg/kg), copper (5.35 mg/kg), zinc (82.50 mg/kg) and selenium (3.15 mg/kg). Therefore, the produced FFWM provides a balanced amount of all essential nutrients including amino acids, fatty acids and mineral contents as well as free of salmonella and yeast & mould. Thus, the current study recommended to produce of fish meal on a commercial scale from fish wastes not be neglected that can collect from fish markets (as a result of cleaning and manufacturing of fish), from fish restaurants in addition to small and large fish that are not used in human consumption as instead of imported fish meal as well as reducing environmental pollution.**Keywords:** FFWM, Composition, Microbial, Amino Acids, Fatty Acids, Minerals