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Evaluation on the Influence of Size on the Nutrient Density of Zambian Fish Species

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Abstract

Zambians poor women and children are highly vulnerable for being quantitatively as well as qualitatively malnourished. Fish is a valuable food item which is rich in protein, but can also be a source of micronutrients and n^{-3} fatty acids. While small indigenous fish often serves as sole animal derived food of poor women and children in Zambia, producers and sellers often concentrate on bigger fish species, which are seen as more valuable. However, nutrient contents of Zambian fish are not studied well enough to know which species are better to prevent deficiencies through an increase in their consumption.

Therefore 66 fish samples, varying in species, processing type and water body, were collected, divided into subgroups (big, medium and small) and prepared according to local customs. Samples were analysed for protein, fat and fatty acid composition with special interest in DHA and EPA. Content of several B-vitamins, dietary minerals and heavy metals was also analyzed.

Except for protein, nutrient contents varied strongly between groups. Mean protein content was 18.22±3.44 g/100g for big, 18.02±2.02 g/100g, for medium and 16.12±2.38 g/100g for small fish. Fat content and fatty acid composition varied much within the subgroups, but small fish mostly contained more EPA and DHA.

Most fish contained high amounts of niacin and cobalamin, but small fish had the highest mean content of cobalamin (9.39± 3.52 μg/100g) compared to big and medium fish (2.51± 2.13 μg/100 g, 2.92± 2.11 μg/100g). Content of other B-vitamins were mostly moderate to low. Mean calcium content of small fish was 861.21±241.71 mg/100g, being about 16 times higher than calcium content of big fish and about 3 times higher than calcium content of medium fish. Small fish often contained higher amounts of iron and zinc too. Heavy metal contents were below threshold values in all samples. Overall it could be shown that Zambian fish are nutrient rich and safe for human consumption. As iron and zinc deficiencies are highly prevalent and calcium and n^{-3} fatty acids are particularly important during pregnancy and child development, production and consumption of fish, but especially of small fish should be recommended.

Keywords: Fish, food security, malnutrition, nutrient density

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