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# Impact of pesticides residue and heavy metals on lipids and fatty acids composition of some seafoods of Red Sea (KSA)

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## Abstract

Seafood is considered by nutritionists to be a high source of omega 3 long-chain polyunsaturated fatty acids (n-3 LC-PUFAs) which are involved in prevention of cardiovascular diseases. The aim of the present study is firstly to detect the presence of organochlorine pesticides and heavy metals in some fresh seafood of Red Sea commonly used in KSA in relation to its contents. It was found that the fatty acids 18:2n-6, 18:3n-6, 18:3n-9 was statistically significantly higher in fresh samples than frozen ($p < 0.05$), smoked ($p < 0.01$) and canned fishes ($p < 0.05$), respectively. Total lipids and cholesterol content of canned and smoked fishes were significantly higher than fresh and frozen samples ($p < 0.01$, <0.05 and $p < 0.01$, <0.05). Vitamin D was found to be lower in frozen samples than fresh, smoked and canned ($p < 0.05$ for each). While vitamin A was higher in fresh and smoked as compared with frozen and canned samples. No organochlorine tested were detected in either fresh or processed samples (smoked, frozen and canned). Among the heavy metals, the highest lead level was detected in fresh and smoked samples as compared with frozen and canned samples. No correlation was found between organochlorine compounds in fish and the corresponding levels in fatty acids. We concluded that, all fishes are safe for uses but it is preferable to use fresh samples due to its high content of PUFA and low lead level.

## Keywords

organochlorine, heavy metals, fishes, Saudi Arabia

## Introduction

The pollution of inland waters by poychlorinated biphenyls (PCBs), chlorinated pesticides and related chemicals follows mainly the dissolving of these substances present in the contaminated industrial, agricultural and sewage effluents, thereby enabling fish to absorb retaining and concentrating them particularly in the fatty tissues.[1] In view of the assessment of the health risks posed by these compounds to humans/mammals, fish and birds, the concept of toxic equivalency factor was developed by the World Health Organization (WHO) jointly with the European Centre for Environment and Health. On the general assumption that the metabolic disposition, tissue distribution, body burden and toxicity of congeners of PCBs operate on an additive basis, the quantitative levels of these congeners can be expressed as toxic equivalents (TEQs). Furthermore, the National Academy of Sciences and National Academy of Engineering as well as Sweden (Swedish Food Regulations, 1983) define the limits for total DDTs, dieldrin, endrin, heptachlor, chlordane compounds and HCB. Moreover, Canadian tissue residue guidelines for the protection of wildlife consumers of aquatic biota also set tolerance limits for organochlorines.[2] Organochlorine pesticides (OCPs) are among the most widely applied chemicals in the world. They have been used for pest and insect control in more than half a century, owing to their negative impact on the ecosystem and human health.[3,4] The agricultural uses of most OCPs, in particular, technical DDT and hexachoro-

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