

## SELENIUM ANALYSIS: A REVIEW

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**Abstract.** *Selenium is an essential microelement for the proper functioning of the human body. It is involved in many metabolic functions and processes having mainly an antioxidant role. It participates in the regulation of the immune system, nervous system, endocrinological system and reproductive system. However, excess selenium has toxic effects. Therefore a proper diet is required, which involves from one side knowing the concentration of selenium in food and from the other side quantifying selenium in biological samples in order to intervene in case of deficiency or intoxication. Over time, a number of analytical methods have been developed: spectrophotometry, spectrofluorimetry, atomic spectrometry, electroanalytical methods, neutron activation methods, x-ray methods, chromatographic methods and plasma spectroscopy methods.*

**Keywords:** selenium, selenium deficiency, selenium analysis, selenium quantification

### 1. Introduction

Because it is vital to healthy development, disease prevention and wellbeing, selenium is considered an essential element in human nutrition [1-3]. At least 30 selenoproteins (thioredoxin reductases, glutathione peroxidases and iodothyronine deiodinases) are known, in which selenium is present in the form of selenocysteine (Se-Cys) and selenomethionine (Se-Met) [4-8]. The role of selenium as an antioxidant is mainly fulfilled by the glutathione peroxidases class, which act by neutralizing reactive oxygen species (ROS) [9]. In addition to the antioxidant role, it also acts as an antimutagenic, anticarcinogenic, antiviral, antibacterial, antifungal and antiparasitic agent [10, 11]. The anticarcinogenic role has been demonstrated in a variety of cellular models and even in some clinical studies [12].

Being a powerful antioxidant, involved in cellular defense against reactions with free radicals, the risk of deficiency seems to increase in proportion to age. There is evidence that most degenerative diseases originate in the harmful reactions of free radicals. These diseases include atherosclerosis, cancer, inflammatory joint, asthma, diabetes, senile dementia and degenerative eye disease [7, 8, 13].

It has been observed that selenium deficiency disrupts mitochondrial activity, and supplements with Se intensifies the activity of selenoenzymes,

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