

Toxic elements in food: occurrence, binding, and reduction approaches

ABSTRACT

Toxic elements such as mercury, arsenic, cadmium, and lead, sometimes called heavy metals, can diminish mental and central nervous system function; elicit damage to blood composition as well as the kidneys, lungs, and liver; and reduce energy levels. Food is considered one of the main routes of their entry into the human body. Numerous studies have been performed to examine the effects of common food processing procedures on the levels of toxic elements in food. While some studies have reported negative effects of processing, several have shown that processing practices may have a positive effect on the reduction of toxic elements in foodstuffs. A number of studies have also introduced protocols and suggested chemical agents that reduce the amount of toxic elements in the final food products. In this review, the reported methods employed for the reduction of toxic elements are discussed with particular emphasis on the chemical binding of both the organic and inorganic forms of each element in various foods. The molecular groups and the ligands by which the food products bind with the metals and the types of these reactions are also presented.

Keyword: Food processing; Toxic elements