

# Influence of Culinary Treatment on Soriz Mineral Elements (*Sorghum oryzoidum*)

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## Abstract

Soriz (*Sorghum oryzoidum*) is a relatively new cereal of hybrid origin obtained at the Research Institute for Maize and Sorghum of Moldova. This paper presents and analyzes the results of the study of essential minerals content (K, Na, Ca, P, Mg, Fe) in native and hulled sorghum grains and their changes under the effect of hydrothermal treatment. The results show that the sorghum grains are a good source of essential minerals, especially of K, P and Mg and are less rich in Ca, Na and Fe. The experimental data have demonstrated that the technological process applied to obtain hulled sorghum leads to a considerable decrease in minerals content. Culinary treatment had a greater impact on the K content and lower on P and Mg content. The results will be used to optimize the parameters of raw material processing and culinary treatment with the aim of minimizing the mineral loss as well as for the nutritional value balance of soriz sorghum dishes.

## Keywords

Whole Grains of Soriz, Hulled Sorghum Grains, Essential Minerals, Culinary Treatment

## 1. Introduction

Cereals and food derivatives from cereals are the staple food of the population all over the world, only the crops being different from one country to another [1] [2]. Diversifying the range of cereals is highly relevant in the context of nutritionists' recommendations to increase the intake of foods rich in complex carbohydrates in combination with decreased lipid intake, in order to reduce the risk of cardiovascular disease and other metabolic diseases [3] [4] which are the leading causes of death in European countries.

Cereal grains are the major source of dietary nutrients in the world. However, a large part of them is lost after processing (peeling, crushing, grinding, mois-

turizing, boiling, frying, expanding, etc.). The loss of mineral elements in the process of decortication depends on the types of cereals, their sizes, the degrees of peeling, etc [5].

The content of mineral elements is also influenced by culinary technological processes, which refer to the ability of cereals to boil in the shortest possible time, accompanied by the improvement of organoleptic qualities.

Prior to the culinary treatment, the cereals are subjected to technological processes of primary processing such as: sorting (sometimes sifting) and washing. The content of dry substances in the water after washing is: starch—about 41%, nitrogen—about 33% and sugar—about 13%. Some research on the influence of hydration (for 24 hours) of whole grains (corn, sorghum, rice, etc.) on the content of iron, zinc and phytates has shown that during hydration in the water passes a considerable amount of iron and less zinc [6].

Knowing the impact of processing on cereals could contribute to the selection of technological processes with a tolerant effect on nutrients, which will increase their accessibility and, respectively, will contribute to increasing public health.

Soriz (*Sorghum oryzoidum*) is a hybrid of sorghum that is characterized by glassy endosperm, similar to rice. It was obtained at the Institute for Scientific Research for Maize and Sorghum in the Republic of Moldova, by crossing Sudan grass (*S. sudanense*) and sorghum bicolor (*S. bicolor*) [7] [8] [9].

The advantages of this crop have many; sorghum is a local crop with high productivity, resistant to drought and high ambient temperatures, a source of macro- and micronutrients with high nutritional value. An important feature of soriz is the absence of gluten, which makes it an optimal alternative in the diver. Diversification of gluten-free products is a relevant and popular field of research, especially for the Republic of Moldova [7] [10] [11].

The paper presents and analyzes the results of the research of the content of essential mineral elements (K, Na, Ca, P, Mg, Fe) in whole grains of soriz and hulled soriz and the modification of their content in the culinary treatment.

The results obtained are useful for optimizing the manufacturing process and technological processing of sorghum grains and groats in order to minimize losses of mineral elements, evaluation and nutritional balance of sorghum-based preparations.

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