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THE EFFECT OF FOOD MATRIX ON WHOLEGRAIN MAIZE FLOUR'S *IN VITRO* DIGESTIBILITY

Functional food products, such as wholegrain flours, have gained special interest due to their potential in improving life quality by exhibiting some desirable health benefits and preventing nutrition-related diseases. The different amylose-amylopectin ratios and the structure of starch granules affect the starch's functional and physicochemical properties, the processing properties of flour, digestibility and the edible quality of the end-use products. Wholegrain maize flour contains more dietary fibers than refined flour, which are mostly located at the pericarp of the maize kernel. Dietary fibers and proteins, which could be either incorporated into the diet or be a part of the food itself, can be the source for gaining long-term health benefits. Maize protein solubility is an important functional characteristic that affects both the nutritional value and the use of maize grains. The digestibility of food plays a crucial role in the modern everyday diet and nutrition. The food matrix, which causes complex correlations between certain chemical components and the digestibility of the food product, is of great importance for this subject.

In recent years, there has been a significant global shift in dietary choices due to growing awareness of the close relationship between nutrition and human health. Wholegrain flours and other functional food products have drawn particular attention because of their potential to enhance life quality by reducing diseases linked to poor nutrition and displaying certain positive health advantages. Long-term health benefits may be obtained from dietary proteins and fibers, which can be contained within the food or incorporated into the diet. In the context of contemporary daily nutrition and diet, food digestibility is vital. The food matrix – which results in intricate relationships between specific chemical components and the food product's digestibility – is crucial for this topic. The structure of starch granules and the varying amylose-amylopectin ratios have an impact on the functional and physicochemical characteristics of starch, flour-processing traits, digestibility, and the edible quality of the final products. Dietary fibers, which are mostly found at the pericarp of the maize kernel, are more abundant in wholegrain maize flour than in refined flour. A modified *in vitro* multi-step digestion process comprising oral, gastric, duodenal, and colon stages was used to assess the possible digestibility of whole grain maize flour for human consumption. Total protein content was determined by the Kjeldahl method, starch content according to the Ewers polarimetric method, and fiber composition according to the Van Soest method modified by Mertens. The chemical composition and *in vitro* digestibility of all the studied maize flours varied significantly. Blue popping maize flour had the lowest digestibility level (19.67%), while sweet maize hybrid flour had the highest digestibility (57.36%). The pericarp was least impacted by the digestion processes, but the germ showed the highest degree of degradation in terms of the digestibility of the various kernel components. It was determined that the intricate processes of food degradation by digesting enzymes depend heavily on variations in chemical composition and inherent kernel structure. Nevertheless, in the near future, more research and advancement on this specific topic are required.

Keywords: maize, wholegrain flour, *in vitro* digestibility, food matrix, chemical properties