

Abstract for the general public

Celiac disease and gluten-related pathologies are associated with the intake of gluten, a protein present in some cereals (wheat, rye, barley) capable of producing important conditions directly or indirectly to the human body. The only present solution is to eliminate these cereals from the diet. However, following a gluten-free diet is not an easy task since grains containing gluten, especially wheat, are the main ingredients in culturally popular foods such as bread, pasta or biscuits. Nowadays, the market for GF products is experiencing a significant growth due mainly to the increase in the number of gluten fragile patients diagnosed and to the emerging of a new niche market for consumers who optionally avoid gluten.

However, the use of grain flour from grains other than common wheat in baked goods is a technological challenge due to the absence of the structural gluten protein network. The creation of the viscoelastic properties similar to those that wheat form, is an essential condition for obtaining fermented, technologically viable and sensory acceptable bakery products from gluten-free formulations.

The aim of the research project is to improve the functional and physical-chemical properties of gluten-free (GF) flours in order to increase the offer and quality of gluten-free breads from a physical, sensorial and nutritional point of view. The proposal will evaluate the impact of thermal treatments by means of microwave radiation (MW) on high nutritional flours and their applicability in the production of GF bread. For this purpose, different treatments conditions will be apply to buckwheat and tef flour in order to a) modify functional, thermal and structural properties of matrices, b) create structure in gluten-free dough matrices or perform as texturizing agents for gels and c) develop high quality gluten-free breads.

The results obtained in the project will be of great interest to all social agents: the industry of first and second transformation of cereals, the manufacturers of the technology and the consumers, particularly those belonging to the coeliac community. In addition, the use of physical, safe and environmentally friendly treatments that contribute to the "clean label" trend will enable the industrial sector to meet the requirements currently demanded by consumers.

This project encompasses various science disciplines as food sciences, bioeconomy, engineering, physics, chemistry, nutrition, environmental and social sciences, medicine and public health in multi- and interdisciplinary, inspiring research program with many benefits and perspectives of industrial application in order to improve the well-being of gluten-free consumers.