

The biochemistry behind quality and sustainability of plant-based food

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Human health is closely linked to food and the environment. All over the world, we are facing the sustainability of food chains. On the other hand, people are pushed to consume more plant-based foods to reduce the negative impacts of the modern food supply on human health. Climate change directly impacts cellular cycles and metabolism. The increasing atmospheric carbon dioxide and the rising temperatures may reduce the overall yield of major staple crops and cause plants to react, leading to the formation of new compounds that can have repercussions on the safety and nutritional features of plant food. Changes can cause compositional variations which in turn lead to variations in nutritional, bioavailability and techno-functional potential. Biochemistry can contribute to fighting the negative impacts. The molecular and physicochemical properties of plant-derived ingredients are peculiar. It is therefore critical to understand the fundamental attributes of plant-derived ingredients.

Although

the primary production and the quality of the plant products are influenced by the atmospheric conditions and the quality must be preserved, on the other the recovery and valorisation of what is still contained in the waste and by-products, which in some matrices amounts up to 40-50% of the content of the original raw material, is of equally primary importance. Today the set-up of eco-sustainable technologies based on biological approaches, including the use of enzymes, microorganisms, and insects/larvae for the recovery and reuse of compounds to be used as such or as food ingredients is a need. New technologies have been developed or are under development in this respect. The present communications aim to focus on these emerging aspects to review and critically discuss the possible application of biomolecular approaches to guarantee the quality and sustainability of plant-based food to the entire current population and future generations.