



Functional Foods as a New Therapeutic Strategy

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Recently, the use of nutraceuticals has drawn attention in the food industry due to their potential health benefits. Nutraceuticals are products that are produced from foods and sold in pills, powders, and other medicinal forms that have both nutritional value and health-promoting properties. They contain bioactive compounds that can prevent and treat various chronic diseases such as antioxidants and anti-inflammatory and antimicrobial agents.

This Special Issue, entitled “Functional Foods as a New Therapeutic Strategy”, provides an overview of various functional ingredients that are used as nutraceuticals, including almond, hazelnut, and pistachio skin, mushrooms, buckwheat, fava bean, hemp flours, apple puree, and microalgae. These have been shown to bestow beneficial effects and could be used for therapeutic, hypoallergenic, or sporting purposes.

Thus, the use of plant-derived materials that are rich in bioactive compounds has the potential to promote health and prevent diseases [1]. Similarly, plant seed mucilage, which is typically discarded during food processing, has been shown to have a range of potential applications in the development of functional foods [2]. The use of these by-products not only offers a potential source of nutraceuticals but also helps to reduce waste in the food industry. In fact, fruit- and plant-based waste (including anthocyanins and phenolic acids) can be incorporated into buckwheat, fava bean, and hemp flour to improve their health-promoting properties [3].

Similarly, mushrooms are being investigated as a potential source of functional food ingredients, with some species showing promise for health promotion and disease prevention [4]. In addition, modified quercetin and pectin have been shown to have effects on cell viability and migration [5].

Another important aspect of nutraceutical research is the study of the gut microbiome and its interactions with dietary components. Thus, in this Special Issue, a study explores the potential of alginate oligosaccharides to modulate gut microbiota and promote health [6].

The use of microalgae as functional foods for mitochondrial protection and the promotion of healthy aging was also revised [7]. Thus, the bioactive compounds present in microalgae, such as carotenoids, phycocyanin, and polyunsaturated fatty acids, have antioxidant and anti-inflammatory properties that have protective effects against aging-related diseases [8]. Goji berry fruits have also demonstrated several beneficial effects on age-related diseases, such as diabetes, atherosclerosis, and cancer, principally due to their bioactive secondary metabolites [9].

On the one hand, functional food can be used to improve sport performance. In this sense, this Special Issue shows that carbohydrate consumption during exercise is important for enhancing endurance, and for this reason, currently, there exist several artificial fructose sources. However, food can also be a source, and is a healthier one. The performance of nine trained male cyclists was not altered regardless of whether natural apple puree (+maltodextrin) or artificial crystalline fructose was consumed. Other parameters, such as heart rate, blood glucose/lactate concentrations, and gastrointestinal symptoms, were



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not altered, showing that a natural fructose source is a valuable alternative to artificial sources [10].

On the other hand, the combination of a linear polysaccharide (chitosan) with physical exercise improved the lipid profile of high-fat diet-fed rats [11]. In fact, this synergism (chitosan + exercise), which lasted for eight weeks, reduced the body weight of the animals, as well as restoring the altered lipid profile (total cholesterol, triglycerides, LDL, and VLDL).

Furthermore, aqueous coriander (*Coriandrum sativum*) leaf extract (ACLE) possesses an anti-allergenic effect, inhibiting the degranulation of rat basophilic leukemia cells and suppressing the increase in intracellular Ca^{2+} that is responsible for this degranulation. Moreover, ACLE is capable of downregulating the phosphorylation of phosphatidylinositol 3-kinase and the tyrosine-protein kinase SYK, attenuating allergen-induced symptoms. Finally, its oral administration reduced the IgE serum level in a pollinosis mouse model [12].

In addition, buckwheat, fava bean, and hemp flours fortified with anthocyanins and other bioactive phytochemicals may have applications in the prevention and treatment of chronic diseases, moreover showing the importance of using sustainable and environmentally friendly practices in the food industry [3].

Of relevant interest is that European black elderberry fruit extract has been demonstrated to be capable of inhibiting the replication of SARS-CoV-2 in vitro [13].

In conclusion, the natural ingredients discussed in this Special Issue highlight the importance of incorporating them into functional food development, as well as of using sustainable and environmentally friendly practices in the food industry.

The continued exploration and generation of nutraceuticals will be critical in addressing the increasing prevalence of chronic diseases and promoting healthy aging.

As consumers continue to seek out natural and functional food products, this research will become increasingly important in the development of new and innovative products that meet their needs.

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