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Today, epidemiological studies show that the high intake of fruits and vegetables is associated with a reduced risk of chronic diseases and the potential beneficial effects are attributed to the presence of bioactive compounds, in particular polyphenols.

Polyphenols are plant secondary metabolites, which are important compounds for the sensory and nutritional quality of foods. Many polyphenol-rich foods are subjected to some form of processing due to their seasonal and perishable nature. Processing may change the polyphenol content of foods depending on the processing type and conditions. In addition, as a result of food processing large amounts of by-products are generated. These by-products are often discarded as waste or valorized in low-value applications. However, these by-products have the potential to be used as relatively cheap but valuable resources for polyphenols. In many cases these by-products contain the same valuable constituents as the starting products and possibly yet uncharacterized active compounds that could lead to higher value applications.

As a part of our diet, polyphenols are ingested as complex mixtures in a food matrix, which undergo a digestion process in the human body. The potential availability of polyphenols after digestion is important, as previous studies have stated that if the bioavailability of a certain polyphenol is poor, it would have a limited effect on health.

Several factors including the chemical state of the compound, its release from the food matrix, or possible interactions with other food components affect the bioavailability of polyphenols. Absorption of polyphenols into the blood streams is also important. Upon absorption, polyphenols undergo phase I and phase II transformations in the human body. Phase I transformations consist of oxidation, reduction, and hydrolysis reactions. Phase II biotransformation, which take place in the liver and intestine, consists of conjugation reactions where methyl, glucuronic, and sulfate derivatives are formed. These metabolites derived from the ingested polyphenols may play a role in the beneficial health effects. Despite the suggestions for polyphenol absorption and metabolism, there is still limited information and much of the detail is missing. Further research is needed for a greater understanding of how polyphenols are absorbed, how the variation of molecular structures is consumed in food, and how the forms generated contribute to the health benefits.

This special issue is intended to discuss the effect of processing and digestion on polyphenol content of foods. This will serve as a comprehensive special issue for researchers, educators, and food processors and product developers providing an up-to-date insight into polyphenols.

Potential topics include but are not limited to the following:

- ▶ Recent advances in characterization of polyphenols
- ▶ Impact of processing on polyphenol content of foods
- ▶ Effect of processing on polyphenol structure, polymerization, and glycosylation
- ▶ Food processing by-products as sources of polyphenols
- ▶ Models to study bioaccessibility/bioavailability of polyphenols
- ▶ Effect of food processing on bioaccessibility/bioavailability of polyphenols
- ▶ Dietary compounds affecting the bioaccessibility/bioavailability of polyphenols
- ▶ Bioactive properties of polyphenols

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