

A Short Note on Dietary Lignans Sushree Sunena*

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Editorial

Among phytochemicals, phenolic substances known as lignans have long piqued the curiosity of food chemists and nutrition specialists. Lignans are vascular plant secondary metabolites that found across the plant kingdom and have been linked to a variety of physiological functions that benefit human health. They are a type of secondary plant metabolite that is formed from the conjunction of two phenylpropanoid C₆–C₃ units at the and' carbon and can be coupled to additional ether, lactone, or carbon bonds; they have a chemical structure similar to that of 1,4-diarylbutane. Plant lignans produce metabolites such as enterodiol and enterolactone, which are referred to as enterolignans due to their colonic origin (named also mammalian lignans). Enterolignans and some of their plant precursors have been shown to have a variety of biological actions, including antitumorogenic, anticarcinogenic, estrogenic or anti-estrogenic, and antioxidant effects. Lignans serve as the foundation for new approaches to health promotion and disease prevention as nutraceuticals and functional foods.

Pilkington is currently analysing the physicochemical properties of classical lignans, neolignans, flavonolignans, and carbohydrate–lignan conjugates using a chemometric approach to determine their absorption, distribution, metabolism, excretion, and toxic (ADMET) profiles, and determining if these compounds are lead-like/drug-like and, thus, have potential to be, or act as, a driver in the development of future. Currently, lignan species and their abundance in food products are being determined. For the extraction and identification of lignans, various methodologies have been developed. The extraction procedure from the food matrix is critical, as is the type of hydrolysis step (alkaline, acid hydrolysis, enzymatic hydrolysis, or a mixture of them).

The growing demand for lignans is piquing interest in the discovery of new sources as well as the improvement of analytical and purification procedures. Analytical values were developed and tested using HPLC, as well as gas or liquid chromatography–mass spectrometry.

Nutrients and bioactive substances, i.e., helpful food components, and non-beneficial food components, are used to investigate the complicated interaction between food, nutrition, and health. In this vein, a specialised directory of information about bioactive component databases is being built at the national and European

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levels, which will be beneficial for the planning and evaluation of clinical and epidemiological research studies on bioactive components. A comprehensive food composition database (FCDB) should be a repository of all numeric, descriptive, and graphical information on the nutrient features of foods; the phrase food composition data refers to all information relating to the description and identification of foods and their food components (nutrient values, number of sample collections and analyses, analytical methods, descriptive coding, pictures, data source, value documentation, and so on) and should include a variety of variables.

Lignans can be found in a wide range of plants from various origins, including the major food plants. Among the latter, flaxseed and sesame seeds are high in lignans, whereas wood knots in coniferous trees, particularly Norway spruce, are the most concentrated lignan sources known so far. Oilseeds (flax, soy, rapeseed, and sesame), whole-grain cereals (wheat, oats, rye, and barley), legumes, various vegetables and fruit (particularly berries), as well as beverages such as coffee, tea, and wine, are the main sources of dietary lignans. Recently, lignans have also been reported in dairy products, meat, and fish. Phenol-Explorer, the first comprehensive database on polyphenol content in foods, and eBASIS (Bioactive Substances in Food Information Systems), published through the EuroFIR project, are two of the major core public databases that collect extensive data on the polyphenol content of foods and beverages. Phenol-Explorer was the first comprehensive web-based database on polyphenol content in foods and an open-access database, and it currently includes new data on pharmacokinetics and metabolites, as well as the effects of food processing and cooking, through multiple upgrades.