

Obtaining Low-Fat Foods and Improved Nutritional Value

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Opinion

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One of the biggest challenges facing food research is the achievement of sustainable food production and, at the same time, the supply of quality food with added functionality for the prevention of diseases regarding the lifestyle. Currently consumers are more aware of food problems and monitor and attempt to harmonize their diet, they have become more preoccupied with improving their general health through daily nutrition [1].

It has been shown that there is a relationship between functional components in food and the health of the consumers. Preventing illness by increasing the consumption of functional foods can also present a socio-economic interest [2].

The effects of a diet high in lipids, mainly in saturated fatty acids, has been, and continues to be, the interest of several guidelines to reduce cardiovascular disease [3,4], obesity and, recently, cancer prevention [5]. Health concerns have led consumers across the world to reduce the consumption of foods that are perceived as high in fat. This has paved the way for a growing market of foods considered healthy while having flavor and natural ingredients. Producers are thus motivated to produce low-fat products that have natural ingredients [6,7].

Health organizations have suggested that the intake of total fats be less than 30% of the daily consumption, to prevent high levels of blood cholesterol, hypertension, obesity and colon cancer [8-10]. In the food sector, 30% of the total fat comes from meat, and 25% comes from pastry / confectionery and other cereal products. Milk products and fats / oils represent 18% respectively 11% of all fats. Overall, these food categories account for 84% of fat in food supply [8]. Although the type of fat in these foods

varies, the effort to reduce total fat and calorie consumption has been largely focused on reducing the fat content of foods in these categories. The effects of fat on cardiovascular disease are so well documented that they have been recognized as major factors in cardiovascular disease [11].

The issues related to the sensory and physico-chemical properties of these products have suggested the use of fat substitutes to ensure the desired qualities [8]. Fat substitutes are compounds incorporated in foods to provide one or more fat roles.

Fat replacers are usually classified based on the source of macronutrients, meaning: proteins, carbohydrates or fats. The caloric value of fat substitutes ranges from 0 to 9 calories per gram [12]. These are divided into two categories: fat substitutes and imitators. The fat substitute is a compound with many characteristics of fat, usually being a synthetically formulated compound but having a similar fat-like structure but resistant to hydrolysis of digestive enzymes [8,13].

On the other hand, fat imitators are substances that may have the sensory and physical characteristics of triglycerides but can't replace fat 1:1. To achieve their functionality, they need high water content [8].

Carbohydrate based fat substitutes use plant polysaccharides, such as fibers and starch, to retain moisture and provide textural qualities that are usually provided by fat. In dairy products and other foods they are used as thickening agents and stabilizers. Protein-based fat substitutes are used to provide a smoother texture and other properties usually offered by fats [12]. Microparticulate protein products can provide creamation as well as fats. These imitators are mixed with water and

used in a smaller amount compared to fat, for example, 1 g of protein-based fat replacer can replace 3 g of fat. Protein-based fat imitators are suitable for dairy products and low-fat pastries [14].

Because functional foods provide the perception that the food industry eliminates less desirable elements in foods (fats, sugars, sodium, etc.) and adds more beneficial ingredients, it can be widely held that all low-fat foods can be considered functional foods due to the nutritional benefits of lipid reduction. For example, fiber-based fat substitutes may claim such benefits, as there is an increase in the recognition of the role of fibers in disease prevention, particularly with regard to heart disease and colon cancer [15].

Recently, the use of fruit and vegetable by-products has increased to reduce environmental pollution. Agricultural and industrial residues are attractive sources of natural antioxidants and dietary fiber [16,17].

Nawal NZ, et al. [18] investigated the extraction and identification of antioxidant compounds in some by-products of vegetables and fruits. New applications of these by-products should be investigated to have a positive impact on the environment or to turn them into useful products. Therefore, the functional properties of shell components such as pectin, flavonoids, carotenoids and limonene [19] should be considered.

The watermelon, *Citrullus lanatus*, is part of the cucumber family (*Cucurbitaceae*) is large, oval, round or elongated [20]. The bark is smooth, with dark green stripes or sometimes pale ones that turns yellowish green when ripe. It is a very rich source of vitamins and a good source of phytochemicals [21].

The therapeutic effect of the watermelon has been reported by numerous researchers and has been attributed to antioxidant compounds [22,23]. Citrulline from green pepper crust is an antioxidant, which protects against the actions of free radicals. In addition, citrulline is converted to arginine, an amino acid that is essential for the heart, circulatory system and immune system [24].

Al-Sayed, et al. [24] assessed some physical and chemical properties of the watermelon shell powder and their use as flour substitutes at 2.5%, 5.0% and 7.5%, and fat from the level of 5.0%, 10% and 15%, as well as a natural source of dietary fiber and antioxidants in the processing of pastry products.

Pumpkin seeds possess valuable nutritional and medicinal qualities, besides being a source of quality edible

oils. Pumpkin seed oil has traditionally been used as a medicine in many countries, such as China, Yugoslavia, Argentina, India, Mexico, Brazil and America. It is used in the therapy of prostate and bladder disorders caused by hyperplasia.

Pumpkin seed cakes that are obtained after pressing and then oil separation are valuable for their composition and nutritional value due to the large amount of raw proteins, fatty acids, minerals and energy. Pumpkin seed cake is an alternative to the manufacture of low-fat products. It is a cost-effective process, and it increases the protein content. They are a rich source of protein, triterpene, lignans, phytosterols, polyunsaturated fatty acids, phenolic compounds, antioxidants, carotenoids, tocopherol and minerals [25].

The use of by-products in the food processing industries is a challenge and an opportunity all over the world. A large amount of by-products are obtained from the minimal processing of fruits and vegetables, represented by coats and seeds, containing large amounts of phenolic compounds with antioxidant and antimicrobial properties, found mainly in these by-products than in the edible parts of the vegetables or fruit.

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