

Cardoon Leaves as a Nutrient Food Source: Promoting Sustainability and Circular Economy

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Agro-industrial by-products are a substantial source of bioactive compounds and nutrients. The valorisation of these by-products has the potential to promote environmental sustainability and a circular economy. This practice can lead to a significant advancement in sustainable food production. Cardoon (*Cynara cardunculus* L.) is a multipurpose crop, and its flowers are used as a natural coagulant in the cheesemaking process in countries such as Portugal and Spain. Cardoon leaves are rich in bioactive compounds, yet they are still often discarded as waste. These leaves can be directly consumed or used as an active ingredient in food packaging, thereby promoting resource efficiency and waste reduction. This study aims to evaluate the nutritional composition of cardoon leaves and their potential as a food ingredient. Fresh cardoon leaves were analyzed according to their content of moisture, ash, total protein, total fat, total dietary fiber, and total sugars, as well as their fatty acid profile. The results, expressed based on the weight of the fresh product, show that cardoon leaves contain 2.4 g/100 g, indicating a rich mineral composition. The total fat content is low, at 0.2 g/100 g, with only 0.05 g/100 g of saturated fat. The protein content (4.2 g/100 g) is considered adequate, highlighting its potential as a plant-based protein source. Additionally, the high fiber content (7.9 g/100 g) supports digestive health, while the low sugar content (0.9 g/100 g) further enhances its nutritional profile. Although cardoon leaves are often considered waste products, they offer substantial nutritional value, boasting high levels of protein, fiber, and minerals, as well as low levels of sugar and fat. Their effective valorisation can create a more sustainable system of food production. By incorporating cardoon leaves into the human diet and food packaging, their full potential can be achieved while minimizing waste and promoting sustainable consumption.

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