

Food Technology and Quality Evaluation

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Horticultural food crops (mostly fruit and vegetables) constitute a significant component of world agriculture, and are a valuable source of vitamins, minerals, protective antioxidants and dietary fibre. Such products command a good price in national and international markets, and many scientific methodologies are utilised to develop, enhance and improve their freshness, shelf life and safety, all of which contributes to boosting trade and results in better returns for farmers and better quality for the consumer. This volume presents a selection of articles that deal with a broad range of topics related to the science, technology and quality evaluation of horticultural crops. The entire spectrum of activities is covered (e.g. production, yield, quality assessment, and selected specific applications).

The opening chapter is concerned with the influence of field conditions and handling operations and parameters on fruit quality: pre-harvest factors, post-harvest treatments, storage technology, ripening and senescence, physiological disorder, transportation, and packaging are discussed. Biochemistry, chemistry and molecular biology techniques have been applied to improve/modify the properties (softening and ripening) and quality, and performance of horticultural products. Several articles in this volume cover such topics as controlling enzymatic browning in fruit and vegetable processing, the relationship between water-soluble and total calcium content and bitterness in apples, and the effect of saline water irrigation and storage temperature on tomato fruit sensory evaluation. The study of plant extracts and the impact of worldwide environmental factors on food crop quality are also discussed. Specific examples covered include the effects of controlled/modified atmospheres on product storage and shelf life.

A significant proportion of this volume is devoted to the application of current techniques and the development of novel methodologies with respect to horticultural products. Examples of topics covered include the use of computer based control systems to collect and analyse storage regimen and process data to improve crop quality, the application of near-infrared techniques for the assessment of soluble solids contents, and juice quality evaluation by anionic profile determination using capillary isotachnophoresis. Another major area of volume coverage is irradiation, which is utilised for extension of shelf life and enhancing post-harvest quality.

This volume will be of interest to all individuals involved with horticultural farms and other aspects of food science and agricultural technology. It provides both substantial background information and specific up-to-date knowledge in a number of key topic areas.

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Antioxidant vitamins and health: cardiovascular disease, cancer, cataracts, and aging

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Oxidation phenomena have been implicated in many illness pathologies, including cancer, which is one of the most serious problems of human health. Carcinogenesis in adults is a multi-step process (initiation, promotion and progression) that can be induced by free radicals acting as toxic agents. Many defense systems normally exist in an organism to prevent oxygen toxicity: antioxidant enzymes (such as superoxide dismutase, catalase and glutathione peroxidase), endogenous radical scavenging proteins, and a range of water and lipid soluble chemical compounds with antioxidant properties. Antioxidants are often able to suppress the initiation phase and slow down tumor development and therefore suppress carcinogenic action, i.e. they are preventative rather than curative. Certain antioxidant vitamins slow down progression as a result of their immunostimulating capacity. Ascorbic acid (vitamin C), a well-known anti-oxidising agent, plays a major role in the detoxification of eventual carcinogens, and vitamin E (α -Tocopherol) and β -Carotene have antioxidant/pro-oxidant effects. A range of other compounds, such as phenols and polyphenols found in wine, tea, onions, olive and sesame oil, rice husk, spices and apples, have beneficial action on various cancers and cardiovascular disease, but their modes of action are not fully understood.

This volume is concerned with the role played by antioxidant nutrients in the prevention of chronic degenerative diseases and conditions, especially cardiovascular disease, cancer, cataracts, and aging. Detailed background information on free radicals, the reactive oxygen species generated in vivo, and reactive nitrogen species involved with such pathologies, is provided, along with in-depth discussion of the mechanisms of anti-oxidation and pro-oxidation effects of vitamins E, C and β -carotene. Information on human antioxidant defenses and selected epidemiological study reviews is also provided, along with an exhaustive description of the biochemistry of antioxidant and antioxidants (both endogenous enzymes and