



Conference Abstract

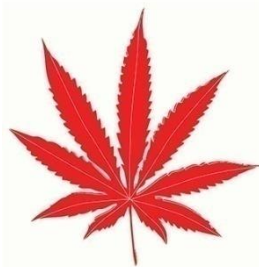
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Conference Abstract

FUNCTIONAL FOOD: VITAMIN C AND THE ROLE OF CITRUS JUICE

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ABSTRACT

The stability and content of vitamin C (Ascorbic acid, AA) in citrus juice is reviewed in relation to industrial practices, along with the role of vitamin C in human diet. Citrus juice and fruits are the rich source of different types of bioactive compounds. Along with vitamin C the citrus fruit and juice also contains phytochemicals, mainly flavonoids which have the antioxidant activity. During the processing of citrus juice, oxygen and temperature are the main factors which are responsible for the loss of vitamin C. Non-thermal juice processing retain the higher levels of vitamin C but this processing technique is delayed in the juice industry due to some economic factors. About the packaging material, vitamin C in fruit juice remain stable when packed or stored in glass or metal containers whereas juice in plastic bottles has shorter shelf life. Transcellular active transport across the wall of intestines is the limiting step for the absorption of vitamin C in humans where AA may be oxidized to dehydroascorbic acid (DHAA), which is easily transported across the cell membrane and immediately reduced back to AA by two major pathways. In the presence of flavonoids the bioavailability of AA has yielded controversial results. While flavonoids seems to reduce the absorption of AA in intestine, some studies shown that AA in citrus extract was more available then synthetic AA. DHAA is reported to possess equivalent biological activity to AA, so recent studies often consider the vitamin C activity in the diet as the sum of AA plus DHAA. However, this claimed equivalence should be carefully reexamined. Humans are one of the few species lacking the enzyme (L-gulonolactone oxidase, GLO) to convert glucose to vitamin C. It has been suggested that this is due to a mutation that provided a survival advantage to early primates, since GLO produces toxic H₂O₂. Furthermore, the high concentration of AA (and DHAA) in neural tissues could have been the key factor that caused primates (vertebrates with relative big brain) to lose the capacity to synthesize vitamin C. Oxidative damage has many pathological implications in human health, and AA may play a central role in maintaining the metabolic antioxidant response. The abundance of



citrus juices in the Mediterranean diet may provide the main dietary source for natural vitamin C.

Key Words: Vitamin C, L-ascorbic acid, Citrus processing, Health diet, Dehydroascorbic acid, Functional food, Biological compounds, Mediterranean diet.