ONLINE ISSN : 1881-3976
PRINT ISSN : 1341-7592

Food Science and Technology International, Tokyo
Vol. 3 (1997) , No. 4 pp.301-309

[PDF (1025K)] [References]

Vitamin E: Mechanism of Its Antioxidant Activity

Ryo YAMAUCHI[1)]

1) Department of Food Science, Faculty of Agriculture, Gifu University

(Received: August 8, 1997)
(Accepted: August 26, 1997)

The antioxidant activity of vitamin E (α-tocopherol) during the peroxidation of unsaturated lipids has been reviewed based on its reaction products. Free-radical scavenging reactions of α-tocopherol take place *via* the α-tocopheroxyl radical as an intermediate. If a suitable free radical is present, a non-radical product can be formed from the coupling of the free radical with the α-tocopheroxyl radical. The reaction products of α-tocopherol with lipid-peroxyl radicals are 8a-(lipid-dioxy)-α-tocopherones which are hydrolyzed to α-tocopherylquinone. If the supply of oxygen is insufficient, α-tocopherol can trap the carbon-centered radicals of lipids to form 6-*O*-(lipid-alkyl)-α-tocopherols. On the other hand, the dimer and trimer of α-tocopherol is formed by the bimolecular self-reaction of the α-tocopheroxyl radical in a reaction mixture containing a large amount of α-tocopherol. The other product-forming pathway yields isomeric epoxy-α-tocopherylquinones and their precursors, epoxyhydroperoxy-α-tocopherones, but the mechanism of this pathway remains unknown. The reaction products of other vitamin E compounds (γ- and δ-tocopherols) during lipid peroxidation are almost the same as those formed from the α-tocopherol. The tocopheroxyl radicals of γ- and δ-tocopherols prefer to react with each other to form dimeric products that are still effective as antioxidants.

Keywords: vitamin E, tocopherol, antioxidant, lipid peroxidation, autoxidation

To cite this article:
Ryo YAMAUCHI, **Vitamin E: Mechanism of Its Antioxidant Activity** *FSTI*. Vol. **3**, 301-309. (1997) .

doi:10.3136/fsti9596t9798.3.301
JOI JST.JSTAGE/fsti9596t9798/3.301