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Delivery of lycopene to physiologically relevant vascular cells

J. Food Lipids 16 (2009) 259-272

Abstract

Lycopene most likely contributes to the positive health effects of tomatoes on the cardiovascular system. However, elucidation of underlying cellular mechanisms is hampered by the intricate solubility of lycopene in aqueous solutions. Cells relevant to the cardiovascular system, including bovine aortic endothelial cells (BAECs), the monocytic cell line THP-1, and RAT-1 fibroblasts, were treated for various time periods (0–72 h) with different concentrations of lycopene (1, 5, and 10 μM), solubilized either in tetrahydrofuran (THF) or micelles as solvents. Incubation of all three cell types led to a concentration- and time-dependent increase in cellular lycopene content. Both vehicles tested, THF and micelles, proved equally effective in the delivery of lycopene to cells. A marked difference in the amount of lycopene incorporated was observed among the various cell types. Compared with THP-1 cells, the uptake of lycopene using both solvents was higher in BAECs and RAT-1 fibroblasts for all concentrations and time points tested.