Strawberry intake increases blood fluid, erythrocyte and mononuclear cell defenses against oxidative challenge

Sara Tulipani, Francesca Giampieri, José M. Alvarez-Suarez, Ana M. Gonzalez-Paramás, Franco Busco, Giovanni Principato, Stefano Bompadre, José L. Quiles

Abstract

The health promoting effects of a regular consumption of strawberries deserve attention, and a direct or indirect antioxidant role of strawberry bioactive compounds is among the most probable mechanisms underlying their beneficial properties. In the present study, we evaluated the overall effects of a 2-week daily consumption of strawberries on plasma antioxidant status, membrane lipid susceptibility to ex vivo-induced oxidation, and erythrocyte and mononuclear cell resistance to oxidative damage in apparently healthy volunteers. After strawberry intake, a moderate increase in fasting plasma antioxidant capacity and vitamin C was observed, together with a significant increase in the lag phase preceding plasma lipid oxidation. A significantly enhanced resistance to oxidative hemolysis was confirmed in red blood cells, while no significant changes were found in the extent of their membrane lipid peroxidation. For the first time, increased intake of strawberries for only 2 weeks was shown to be sufficient to attenuate mononuclear cell mortality after ex vivo exposure to a single acute oxidative challenge, but the analysis of DNA oxidative damage gave conflicting results. These findings suggest that a regular consumption of strawberries may enhance body defences against oxidative challenges.

Abbreviations

BHT, butylated hydroxytoluene; DDD, daily diet diary; EthD-1, ethidium homodimer; FFQ, food frequency questionnaire; FOX, Ferrous Oxidation-Xylenol Orange; PBMCs, peripheral blood mononuclear cells; RBCs, red blood cells; t-BOOH, tert-butyl hydroperoxide

Keywords

Strawberry; Human study; Plasma antioxidant status; Antihaemolytic effects; Mononuclear cell mortality; DNA damage

Corresponding author. Address: Dipartimento di Scienze Cliniche Specialistiche ed Odontostomatologiche-Sez Biochimica, Facoltà di Medicina, Università Politecnica delle Marche, Via Raineri 65, 60100 Ancona, Italy. Tel.: +39 071 2204646, fax: +39 071 2204123.
1 Present address: Biomedical Research Laboratory, IIBIMA, Service of Endocrinology and Nutrition, Virgen de la Victoria Clinical Hospital, Malaga, Spain.
2 Present address: Dipartimento di Scienze Agrarie, Alimentari ed Ambientali (D3A), Università Politecnica delle Marche, Ancona, Italy.

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