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# Importance of tomato (Lycopersicon esculentum) consumption on the plasma status of antioxidant microconstituents in healthy young women

Ana F Vinha, P.C. Pires, M. O. Soares, R. Iglésias, M.J. Pérez and J.G. Estévez

*Functional Biology and Health Sciences*
*Research Center in Health Technology, CITS-IPSN/CESPU, Portugal*
*Department of Functional Biology and Health Sciences,*
*University of Vigo, Spain*

Tomato fruit and especially concentrated tomato paste are important sources of antioxidants in the Mediterranean diet. Tomatoes (Lycopersicon esculentum) are widely consumed either raw or after processing and can provide a significant proportion of the total antioxidants in diet. Amongst the carotenoids, lycopene predominates and is mainly responsible for the red colour of tomato fruits and their derived products. Epidemiological studies have also suggested a possible role for tomato (based on its lycopene content) in the prevention of cardiovascular diseases by inhibiting the formation of oxidised products of LDL cholesterol. The continuing increase of obesity in young people is due in part to changes in eating patterns. The current obesity, seen in younger generations is a public health problem because of increased risk of persistence into adulthood and the risk of diseases related to it, such as diabetes mellitus, metabolic syndrome and vascular complications. The aim of this study was to identify the plasma antioxidant microconstituents mainly affected by tomato fruit consumption, to check whether tomato consumption can affect antioxidant status, and to identify tomato product antioxidant-microconstituents mainly involved in the effect of these products on oxidative stress. Twenty five healthy young ($18 < \text{years} < 25$), non obese ($18 < \text{BMI (Kg/m2)} < 25$) females were recruited by advertisement. The usual diet of the subjects was supplemented for four weeks with 90 g/day tomato puree. Fasting blood samples were collected the day before supplementation, the day after supplementation period, and the day after the depletion period. The status of several antioxidant microconstituents (plasma microcosntituents concentrations) and antioxidant status (plasma total antioxidant capacity) were assessed together with anthropometric analysis (body mass index - BMI). Supplementation with tomato puree significantly increased plasma lycopene, β-carotene and vitamin C ($p < 0.05$) with significant decreased of plasma triglycerides and total cholesterol ($p < 0.01$). Anthropometric parameters also changed significantly and may be related to plasma antioxidant activity, as measured by chemiluminescence, positively related to the status of lycopene, β-carotene and vitamin C. Results suggest that tomato fruit consumption can affect not only the status of lycopene, β-carotene and vitamin C. The effect on plasma lycopene and β-carotene is apparently mainly responsible for the beneficial effect of these products on plasma antioxidant status and their importance in Mediterranean diet.