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Impact of increasing doses of flavonoid-rich and flavonoid-poor fruits and vegetables on antioxidant status in humans–FLAVURS study

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Emerging epidemiological evidence indicates that the consumption of fruits and vegetables (F&V) is associated with reduced risk of CVD, with evidence that dietary flavonoids present in F&V may contribute to the CVD benefits of increased F&V intake. However, a clear dose–response relationship between consumption of F&V and risk reduction is still absent. The present study investigated the effects of different amounts and types (flavonoid-rich or flavonoid-poor) of F&V intake on the antioxidant status of human subjects, as an indicator of risk of CVD. In a randomized, controlled parallel intervention study, 154 subjects (ages 30–70 years, 94 females, 60 males) who were at above average risk of developing CVD were randomly recruited into one of the 3 groups: flavonoid-rich F&V or flavonoid-poor F&V intervention group or habitual diet group (control). Subjects in the two intervention groups sequentially increased their F&V intake by 2, 4 and 6 extra portions for 6 weeks across an 18-week period. Blood samples were taken 4 times at week 0, 5, 11 and 17 for antioxidant status assessment by plasma ferric reducing antioxidant power (FRAP) and vitamin C concentrations. Both intervention groups showed significantly higher plasma FRAP values than the control group following 4 extra portion F&V ($P < 0.001$), with the flavonoid-rich group having significantly higher FRAP values than both the flavonoid-poor and the control groups following 6 extra portions F&V ($P < 0.001$). No significant changes were observed in the FRAP values of the control group throughout the study. The plasma vitamin C levels of the flavonoid-rich and flavonoid-poor groups were similar and significantly greater than that of the control group following 2, 4 and 6 extra portion F&V ($P = 0.001$). In conclusion, increased consumption of flavonoid-rich or -poor F&V contributed to significant dose-response increases in vitamin C and antioxidant status of human subjects.

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