OC38: Introduction of plasma vitamin C and Ferric Reducing Antioxidant Power into a combined biomarker with plasma carotenoids increases the association with fruit and vegetable intake

Y. Jin¹,²,³, M. H. Gordon²,³, D. Alimbetov²,³,⁴, M. F.-F. Chong²,³,⁵, T. W. George²,³,⁶, J. P. E. Spencer²,³, O. B. Kennedy², K. M. Tuohy²,⁷, A.-M. Minihane²,⁸, and J. A. Lovegrove²,³
For The FLAVURS study group
¹Department of Health Sciences, Liverpool Hope University, Liverpool L16 9JD, UK, ²Hugh Sinclair Unit of Human Nutrition, ³Institute of Cardiovascular and Metabolic Research, Department of Food and Nutritional Sciences, the University of Reading, Whiteknights, PO Box 226, Reading RG6 6AP, UK, ⁴Department of Bioengineering, Cell Technologies and Cell Therapy, Centre for Life Sciences, Nazarbayev University, 53 Kabanbay Batyr Ave., Astana, 010000, Kazakhstan, ⁵Clinical Nutrition Research Centre, Singapore Institute for Clinical Sciences, A*STAR, 14 Medical Drive, #07-02, Singapore 117599, ⁶Ellison Building, Department of Applied Sciences, Faculty of Health and Life Sciences, Northumbria University, Newcastle Upon Tyne NE1 8ST, UK, ⁷Research and Innovation Centre, Fondazione Edmund Mach, via Mach 1, 38010 San Michele all’Adige, Trento, Italy and ⁸Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, UK

Monitoring of fruit and vegetable (F&V) intake is fraught with difficulties. Available dietary assessment methods are associated with considerable error and use of biomarkers offers an attractive alternative(1). Few studies to date have examined the use of plasma biomarkers to monitor or predict F&V intake of volunteers consuming a wide range of intake from both habitual F&V and manipulated diets. This study combined plasma vitamin C and carotenoid concentrations with Ferric Reducing Antioxidant Power (FRAP) as an integrated biomarker of F&V intake and compared the predictive powers of each single and integrated biomarker for F&V intake. Data from a randomized, controlled, dietary intervention study (FLAVURS) (n = 154) in which the test groups had observed sequential increases of 2·3, 3·2 and 4·2 portions of F&V every 6-wk across an 18-wk period was used in this study. A modified integrated plasma biomarker was devised which included plasma vitamin C, total carotenoids and FRAP values, and this gave a better correlation with F&V intake (r = 0.516, P < 0·001) than the individual biomarkers (r = 0·332, P < 0·001; r = 0·417, P < 0·001; r = 0·136, P = 0·099 respectively). Inclusion of urinary potassium concentration did not significantly improve the correlation. The modified integrated plasma biomarker more accurately predicted F&V intake to within 2 portions of the actual intake in 54·3±4·9% of the population compared with plasma carotenoid concentration (48·3±11·3%), although this difference did not reach statistical significance (P > 0·05). Either plasma carotenoid concentration or the integrated biomarker could be used to distinguish high and low F&V consumers.

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