

Effect of Fermented Orange Juice Intake on Urinary 6-Sulfatoxymelatonin in Healthy Volunteers

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Abstract : Melatonin is a bioactive compound involved in multiple biological activities such as glucose tolerance, circadian rhythm regulation, antioxidant defense or immune system action. In elderly subjects the intake of foods and drinks rich in melatonin is very important due to its endogenous level decreases with age. Alcoholic fermentation is a process carried out in fruits, vegetables and legumes to obtain new products with improved bioactive compounds profile in relation to original substrates. Alcoholic fermentation process carried out by *Saccharomycetaceae* var. *Pichia kluyveri* induces an important synthesis of melatonin in orange juice. A novel beverage derived of fermented orange juice could be a promising source of this bioactive compound. The aim of the present study was to determine whether the acute intake of fermented orange juice increase the levels of urinary 6-sulfatoxymelatonin in healthy humans. Nine healthy volunteers (7 women and 2 men), aged between 20 and 25 years old and BMI of 21.1 ± 2.4 kg/m², were recruited. On the study day, participants ingested 500 mL of fermented orange juice. The first urine collection was made before fermented orange juice consumption (basal). The rest of urine collections were made in the following time intervals after fermented orange juice consumption: 0-2, 2-5, 5-10, 10- 15 and 15-24 hours. During the experimental period only the consumption of water was allowed. At lunch time a meal was provided (60 g of white bread, two slices of ham, a slice of cheese, 125 g of sweetened natural yoghurt and water). The subjects repeated the protocol with orange juice following a 2-wk washout period between both types of beverages. The levels of 6-sulfatoxymelatonin (6-SMT) were measured in urine recollected at different time points using the Melatonin-Sulfate Urine ELISA (IBL International GMBH, Hamburg, Germany). Levels of 6-SMT were corrected to those of creatinine for each sample. A significant ($p < 0.05$) increase in urinary 6-SMT levels was observed between 2-5 hours after fermented orange juice ingestion with respect to basal values (increase of 67,8 %). The consumption of orange juice did not induce any significant change in urinary 6-SMT levels. In addition, urinary 6-SMT levels obtained between 2-5 hours after fermented orange juice ingestion (115,6 ng/mg) were significantly different ($p < 0.05$) from those of orange juice (42,4 ng/mg). The enhancement of urinary 6-SMT after the ingestion of 500 mL of fermented orange juice in healthy humans compared to orange juice could be an important advantage of this novel product as an excellent source of melatonin. Fermented orange juice could be a new functional food, and its consumption could exert a potentially positive effect on health in both the maintenance of health status and the prevention of chronic diseases.

Keywords : fermented orange juice, functional beverage, healthy human, melatonin

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