

Changes in Plasma Lipid and Antioxidant Activity in Rats as a Result of Naringin and Red Grapefruit Supplementation

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The aim of this investigation was to compare the influence of naringin versus red grapefruit juice on plasma lipid levels and plasma antioxidant activity in rats fed cholesterol-containing and cholesterol-free diets. The antioxidant activity of a correlated quantity of red grapefruit juice was higher than that of naringin. Forty-two male Wistar rats were randomly divided into six groups of 7 named control, naringin, grapefruit, Chol, Chol/naringin, and Chol/grapefruit. The rats of the control group were fed basal diet (BD) and 1–2 mL of distilled water. To the BD of the other five groups were added 0.46–0.92 mg of naringin dissolved in 1–2 mL of distilled water (naringin), 1–2 mL of red grapefruit juice (grapefruit), 1% of nonoxidized cholesterol (NOC) and 1–2 mL of distilled water (Chol), 1% of NOC and 0.46–0.92 mg of naringin in 1–2 mL of water (Chol/naringin), and 1% of NOC and 1–2 mL of red grapefruit juice (Chol/grapefruit). After 30 days of different feeding, it was found that diets supplemented with red grapefruit juice and to a lesser degree with naringin improved the plasma lipid levels mainly in rats fed cholesterol and increased the plasma antioxidant activity. In conclusion, naringin is a powerful plasma lipid lowering and plasma antioxidant activity increasing flavonone. However, fresh red grapefruit is preferable than naringin: it more effectively influences plasma lipid levels and plasma antioxidant activity and, therefore, could be used as a valuable supplement for disease-preventing diets.

KEYWORDS: Naringin; red grapefruit; plasma lipids; antioxidant activity; rats

INTRODUCTION

The beneficial health effects of diets supplemented with different fruits and vegetables have enhanced the interest in their bioactive compounds (1–3). It was shown that the positive influence of these natural products is mostly connected with their antioxidants and certain parts of dietary fiber (4). Citrus fruits have a high content of these substances and, as a consequence, a high antioxidant capacity (5). Naringin is one of the flavonones and is a permanent component of grapefruit juice (6). Ross et al. (6) have analyzed nine commercial brands

of grapefruit juice for their flavonoid content using HPLC methods. Naringin has been identified in all grapefruit juices. Others received similar results (7). Some authors claim that naringin can alter cholesterol metabolism and antioxidant status when rats are fed a diet high in cholesterol (8). To assess these properties of naringin, it was decided to compare the well-known plasma lipid-lowering and antioxidant effects of red grapefruit juice with correspondent quantities of this flavonone in rats fed cholesterol-containing and cholesterol-free diets (9, 10).

As far as we know, there are not such comparative investigations that also include experiments on laboratory animals.

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MATERIALS AND METHODS

Chemicals. All reagents were of analytical grade. Deionized and distilled water was used throughout. All used chemicals, naringin, Trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid), and