

Relative bioavailability of coumarin from cinnamon and cinnamon-containing foods compared to isolated coumarin: A four-way crossover study in human volunteers.

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Abstract

Scope: Cassia cinnamon contains high levels (up to 1 %) of coumarin. Heavy consumption of this spice may result in a dose exceeding the tolerable daily intake (TDI). In this context, the question was raised whether coumarin in the plant matrix of cinnamon has the same bioavailability as isolated coumarin. Methods and results: A four-way crossover study was performed, in which the same dose of 12 mg coumarin was administered in different formulations to 24 healthy volunteers. The relative extent of absorption measured as urinary excretion of the main metabolite 7-hydroxycoumarin (7OHC) was found to be 62.8% for isolated coumarin in a capsule (reference), 56.0% for cinnamon in capsules, 66.1% for cinnamon tea, and 54.7% for cinnamon in rice pudding (means, n=23, observation period 8 hours). Additionally, 7OHC plasma levels were measured for 105 minutes after administration and revealed a fast absorption of coumarin from cinnamon tea leading to the highest peak concentrations. Conclusion: The relative extent of absorption of coumarin from powder of cassia cinnamon is only slightly lower than that of isolated coumarin. Therefore, the TDI of coumarin can be used for risk assessment of coumarin exposure from cinnamon-containing meals.

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