

Bioavailability of Chlorogenic Acid

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SUMMARY

Absorption and metabolism chlorogenic acid (5-*O*-caffeoylquinic acid, CGA), the main phenolic acid in the human diet, was studied in rats in order to determine where and under which form this ester of caffeic acid is absorbed. Nutritional intervention, *in situ* intestinal perfusion and *in situ* gastric infusion studies were carried out. CGA was found stable in the stomach and small intestine contents, whereas it was hydrolysed into caffeic acid in the cecum. CGA and caffeic acid appeared early at 1.5 h in plasma and urine, suggesting an absorption of CGA in the upper part of the gastro-intestinal tract. Using the *in situ* intestinal perfusion rat model with cannulation of biliary duct, the net absorption of CGA was determined and accounted for 8%. Part of CGA was recovered in the gut effluent as caffeic acid showing the presence of trace esterase activity in the gut mucosa. No CGA was detected in either plasma or bile and only low amounts of phenolic acids were secreted in the bile. The present results show that CGA is absorbed with hydrolysis in the small intestine but does not explain the rapid appearance of CGA in aorta blood showed in the first experiment. Consequently, by infusing gastric buffer supplemented with CGA in the ligated stomach of food deprived rats during 30 min, intact CGA was found in the gastric vein and aorta. No other metabolites could be detected. These results show that CGA is quickly absorbed in the rat's stomach in its intact form, absorbed with hydrolysis in the small intestine and hydrolysed into caffeic acid by the microflora in the cecum. Moreover, in contrast to numerous flavonoids, absorbed CGA is poorly excreted in the bile or in the gut lumen.