

*Please structure your abstract according to the following subheadings: **Objective(s)**, **Method(s)**, **Result(s)**.

Absorption and Metabolic Fate of γ -Oryzanol

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Profile

Dr. Kiyotaka NAKAGAWA is now working as a Professor of Food & Biodynamic Chemistry Laboratory, Graduate School of Agricultural Science, Tohoku University. He is currently a Department Chair at Department of Applied Biological Chemistry, Faculty of Agriculture, Tohoku University. He got his PhD in 1999. His present research focus on chemical structures, physiological significance and metabolism of food components, in order to explain their health effects on humans. Dr. Nakagawa serves now as Secretary General of Organizing Committee of IUNS-22nd International Congress of Nutrition in Tokyo, Japan 2021.

Objective: γ -Oryzanol (OZ) is a mixture of ferulic acid esters of several sterols and triterpene alcohols. OZ components (e.g., cycloartenyl ferulate, 24-methylenecycloartanyl ferulate, campesteryl ferulate, and β -sitosteryl ferulate) are abundant in crude rice bran oil. Although the beneficial effects (e.g., lipid-lowering activity) of OZ have been extensively investigated, few studies have evaluated the absorption and metabolism of OZ. Moreover, it is unclear whether OZ, once ingested, is directly absorbed by the intestine into the bloodstream at a sufficient level to exhibit physiological activities. Therefore, we conducted an animal study and evaluated whether OZ is present at such levels in plasma.

Method: We prepared OZ concentrate from purified rice bran oil (Rice Oil OZ) and determined its OZ concentration. Rice Oil OZ was orally administered to mice, after which the OZ concentration in plasma was determined by chromatography-mass spectrometry (LC-MS) analysis.

Results: LC-MS analysis showed that the Rice Oil OZ was composed of 52.2% OZ. In the animal study, the OZ concentrations of plasma from the control (vehicle-treated) mice were low (trace levels); however, at 5 h after a single oral administration of the Rice Oil OZ (600 mg per kg body weight), the levels significantly increased, reaching 17.6 ng/mL for cycloartenyl ferulate, 28.2 ng/mL for 24-methylenecycloartanyl ferulate isomers, 15.6 ng/mL for campesteryl ferulate, and 5.1 ng/mL for β -sitosteryl ferulate, respectively, expressed in equivalence of cycloartenyl ferulate in plasma¹. These results provided the first mass spectrometric evidence suggesting that a portion of orally administered OZ is directly absorbed by the intestine and is present in the intact form in plasma. The presence of a significant amount of OZ in its intact form in plasma may explain the beneficial effects of OZ in vivo. In this symposium, I will introduce further evidence to support the hypothesis.

1. Kobayashi E, Ito J, Kato S, Sawada K, Matsuki M, Hashimoto H, Miyazawa T, Nakagawa K, *Food Funct.*, **7**, 4816-4822 (2016)