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EFFECTS OF ORALLY ADMINISTERED GENISTEIN AND DAIDZEIN ON BRAIN GLUTATHIONE LEVELS IN RATS

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Genistein and daidzein, major isoflavones in soybean, have been reported to provide an antioxidative activity in vitro. However, the reports for in vivo studies are very limited. Glutathione, a low molecular weight tripeptide consisting of Glu-Cys-Gly, presents at a quite high concentration and conducts important functions for defense against reactive oxygen species in brain tissues.

We investigated the effects of oral administration of the isoflavones (0, 2 and 10 μ M genistein or daidzein/kg body weight) on glutathione levels in brain tissues of rats. Twenty-five, Sprague Dawley, male rats with average 250 g body weight were fed a purified-type diets (AIN-93M), which were modified to be isoflavones free and supplemented with RRR- α -tocopherol acetate at 150 IU/kg diet for four weeks.

Levels of α -tocopherol, reduced glutathione(GSH) and oxidized glutathione (GSSG) were measured in brain tissue homogenate, mitochondria, cytosol and microsomes. Rats orally administrated 10 μ M isoflavone showed lower levels of mitochondrial GSH ($p < 0.05$) and higher GSSG compared to the group fed 0 isoflavone diet. Ingestion of isoflavones, particularly 10 μ M genistein or daidzein, tended to increase α -tocopherol content in homogenate. The other organelles tended to follow the same pattern as the mitochondria.

In conclusion, orally administrated genistein and daidzein may have influenced cellular GSH levels in brain tissue through sparing the α -tocopherol. Daidzein appeared to be more prominent than genistein in saving the α -tocopherol in the organelles.