The Effect of Adding Chinese Food Supplements to Rice on Glycemic Response

Chiao-Hsin Yang, Meng-Hsueh Amanda Lin and Jenshinn Lin*

Department of Food Science, National Pingtung University of Science and Technology, Neipu, Pingtung 91201, Taiwan (R.O.C.)

**Corresponding author. E-mail: jlin@mail.npust.edu.tw*
https://doi.org/10.12982/CMUJNS.2017.0016

ABSTRACT

Although an international table of glycemic index (GI) values has been published, most listed values pertain to single foods. However, in recent years, mixed-diet GI has been widely studied. This study determined the dose-response and mixture interaction effects of food processing supplements (gluten protein, canola oil, and dextrin fiber) combined with white rice on glycemic response and GI. Twelve healthy adults aged 18-26 years were fed a test or reference food containing 50 g of available carbohydrates. Venous blood samples were collected before the meal and at 15, 30, 45, 60, 90, and 120 min after the meal. The results showed that white rice has a GI value of 93.8±2.8. Supplementation with various amounts of lipids and dextrin reduced the GI slightly, whereas gluten supplementation significantly ($p < 0.05$) reduced the GI from 93.8 to 84.9 and 83.1, respectively. Analysis of the interaction of gluten, lipids, and dextrin on GI using three-way ANOVA revealed that significant effects on GI value were found with gluten ($p < 0.01$) and dextrin ($p < 0.05$). Moreover, adding a gluten protein and dextrin fiber mixture yielded a larger glycemic control effect than adding a lipid and dextrin fiber mixture did. In conclusion, adding gluten protein supplements to rice products may reduce overall postprandial glycemic response and induce a lower GI in healthy people.

Keywords: Glycemic index, White rice, Supplementation, Gluten protein, Dextrin fiber

INTRODUCTION

Otto and Niklas (1980) were the first to analyze the glycemic responses to various foods. Jenkin et al. (1981) originally conceived the glycemic index (GI). On a scale of 1 to 100, foods can be classified as low GI foods (≤ 55), medium GI foods (56 - 69), and high GI foods (≥70). GIs are typically obtained by dividing the incremental postprandial blood glucose level by the corresponding level after ingesting an equivalent carbohydrate portion (25 or 50 g) of a reference food (Jenkins et al., 1983). Foods with a high GI are more rapidly digested and absorbed, causing greater fluctuations in blood glucose per unit of carbohydrate