

**Title** Effects of glutaminase deamidation on the structure and solubility of rice glutelin  
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### **Abstract**

The effects of glutaminase on deamidation of rice glutelin were investigated. Water-insoluble rice glutelin was deamidated to the extent of deamidation degree 52.29% in 200 mmol/L sodium phosphate buffer (pH 7.0) at 37 °C for 48 h. Zeta potential analysis indicated that the glutamines of rice glutelin were deamidated into glutamic residues. Size exclusion chromatography results demonstrated that glutaminase deamidation broke the hydrophobic, hydrogen and some intermolecular disulfide bonds in rice glutelin and thereby rearranged the molecular weight distributions without serious cleavage of the peptide bonds. Fourier transform infrared analysis revealed the transformation of  $\alpha$ -helix to random coil and  $\beta$ -turn by deamidation and suggested that deamidated rice glutelin maintained more flexible or extended forms. Solubility properties of rice glutelin in mildly acid (pH 5) and neutral buffers (pH 7) were remarkably improved by glutaminase deamidation. These new features of deamidated rice glutelin suggested that glutaminase could be a potential tool for enhancing the usability of rice protein in the food industry.