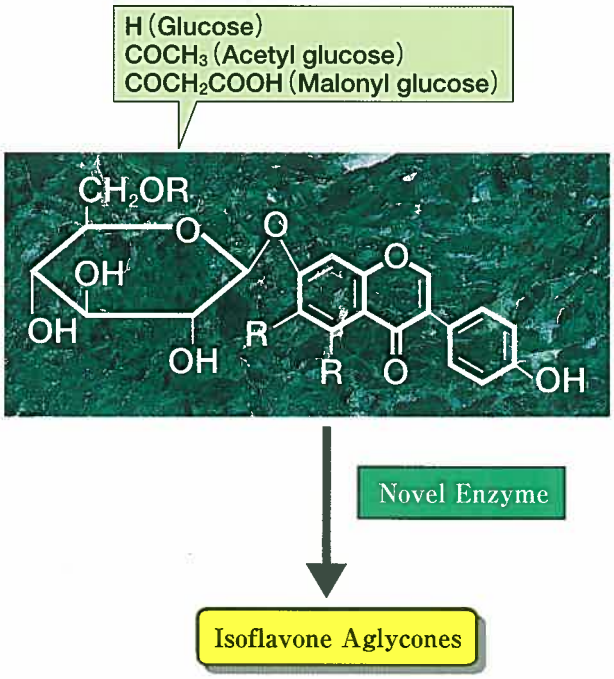
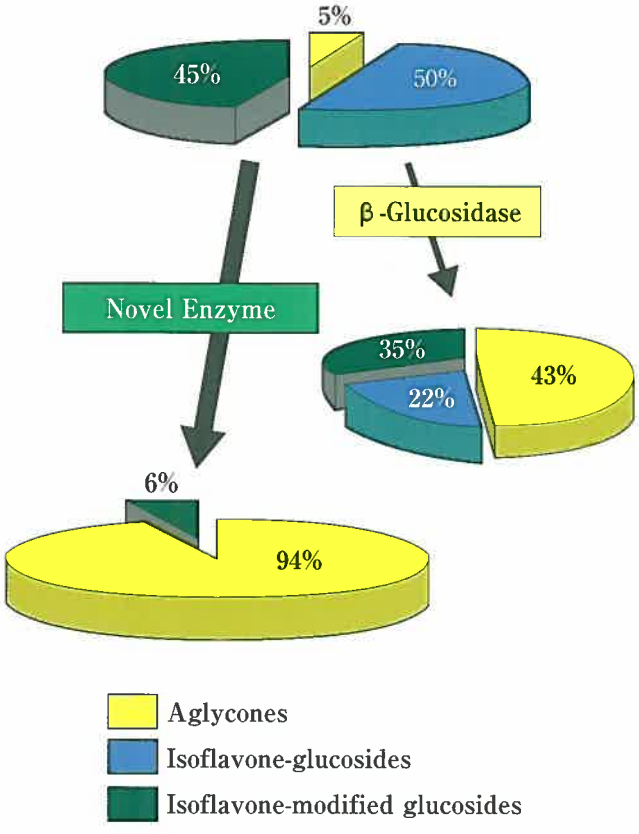
A Novel Enzyme for Isoflavone Aglycone Production

Soy food products are getting more attention from both ingredient suppliers and food manufactures in the fast growing functional foods/nutraceutical market. The soybean is unique in that it contains very high levels of isoflavones, up to about 4 mg/g dry weight. Mounting scientific evidence indicates that these unique phytochemicals can lower the incidence of heart disease and certain hormone-related cancers, reduce the risk of osteoporosis and ease menopausal symptoms. In soybean, isoflavones are present in the form of glycosides (with sugar) or aglycones (without sugar). The glycoside form is the major form of isoflavones in soy products. Recent studies show that isoflavones in the aglycone form are absorbed more efficiently into the blood stream. It is also reported that the isoflavone aglycones show greater antioxidant activity than their corresponding glycosides. Therefore, converting isoflavone glycosides in soy products to isoflavone aglycones may increase their bioavailability and improve their health benefits.





Amano has isolated a novel microbial enzyme capable of transforming isoflavone glycosides into isoflavone aglycones in soy products. This novel enzyme preparation utilizes all 9 isoflavone glycoside isomers found in soybeans. As a result, the novel enzyme preparation converts nearly all soy isoflavone glycosides to isoflavone aglycones (daidzein, genistein and glycitein) in a one step reaction. In contrast, current commercial β-glucosidase preparations convert isoflavone glucosides, but have little activity on modified glucosides (6"-O-acetyl glucoside and 6"-O-malonyl glucoside).

This novel enzyme and a new production method for isoflavone aglycones using the novel enzyme are the subject of a patent (WO0018931A) and were presented at "The Third International Soybean Processing and Utilization Conference" held in Japan (October, 2000). With this new production method, isoflavone glycosides in various soy products (defatted soy meal, soy concentrates, roasted soy flour and soymilk) can be efficiently converted to isoflavone aglycones, the readily bioavailable isoflavone form. We believe that this new process is superior to current conversion processes for soy isoflavones: acid hydrolysis, microbial fermentation and enzymatic hydrolysis by β-glucosidase combined with alkali pretreatment. *We have been working toward the commercialization of this novel enzyme preparation.*