

## Characteristics of Synthesizing Enzymes of Nicotianamine as Anti-Hypertensive Substance, in Germination of Soybean and Its Application for Food

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### Summary

Nicotianamine, an anti-hypertensive substance that decreases in soybeans during germination, can be developed from soybean seedlings for new healthy functional foods for people with high-blood pressure. Nicotianamine is produced by two enzymes as methionineadenosyl transferase (MAT) and nicotianamine synthase (NAS). First, S-adenosyl methionine (SAM) is produced from methionine and ATP by MAT. Subsequently, NAS produces nicotianamine from SAM. This study was conducted to examine nicotianamine and enzyme characteristics for production of new healthy functional foods containing nicotianamine. Soybeans were seedlings using deionized water or sodium chloride solutions. SAM, nicotianamine, and methionine were assayed using an LC/MS/MS system. Decreasing amounts of ATP were assayed for MAT activity at 37°C. Long sprouts were grown from soybeans that had been germinated using deionized water. However, sprouts grown from soybeans germinated using high concentrations of sodium chloride solution were short. Soybeans were not grown using 10% sodium chloride solution. Nicotianamine was present in large quantities in soybeans germinated in 5% sodium chloride solution. Results suggest that the soybeans produced nicotianamine under salt stress conditions. Crude enzyme extraction was done from germinated soybeans reacted in ATP and methionine solution. The enzyme produced SAM quickly. Nicotianamine was produced slowly by the enzyme extract. MAT germinated in 5% sodium chloride solution was the highest among germinating bean conditions. Furthermore, it contained low levels of methionine. Methionine in beans germinated in 5% sodium chloride solution was apparently converted by MAT. Results suggest that MAT is an important enzyme for high-level nicotianamine production.