5th. Global Conference on Agriculture

Berlin, Germany 13 - 15 March 2025

Evaluation Of a Method for Measuring Tocopherol Content in Soybeans

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Abstract

In recent years, with the increase in the number of patients suffering from lifestyle-related diseases, soybeans, which are rich in plant-based protein, have attracted attention as a substitute for animal protein. Tocopherols, one of the major nutritional components of soybeans, have high antioxidant capacity. Therefore, the tocopherol content greatly affects the quality of soybeans, making the accurate determination of tocopherols necessary. Soybeans are often consumed as cooked beans. Since tocopherols are lipid-soluble, lipid extraction is essential to measure their content. However, boiled soybeans contain a large amount of water, which may hinder effective extraction using conventional lipid extraction method. Therefore, in this study, lipid extraction and tocopherol content analysis of boiled soybeans were investigated. The results showed that the precision and accuracy of each tocopherol standard at known concentrations ranged from 1.75 % to 10.8 % and 92.3 % to 109.7 %, respectively, when measured using high-performance liquid chromatography after pretreatment with a combination of chloroform/methanol agitation extraction and saponification. For the boiled soybean samples, the accuracy ranged from 0.49 % to 8.62 %. Both the standards and the samples met the standard values for accuracy and precision at each concentration. These results indicated that pretreatment with chloroform/methanol agitation extraction and saponification was sufficient for the determination of tocopherols in boiled soybeans.

Keywords: soybean, tocopherol, lipid extraction