

Analysis of free fatty acid compositional change in soybean (*Glycine max* L.) flour depending on storage condition

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[Introduction]

Soybean is cultivated extensively from the tropics to temperate northern regions. It is used for long time in the Orient because it is a summer crop which needs high temperature and humidity but is easy to cultivate. In Korea, soybean is used not only as food materials such as soy milk, tofu, and soybean paste but also as a traditional dessert ingredient. Soybean is beneficial to health because they contain proteins and fats, especially large amounts of unsaturated fatty acids. Fat is thought to be one of major factors in the quality of soybean. But soybean flour has the disadvantage of being easily rancid during distribution. Therefore, it is necessary to investigate the change of quality of raw soybean flour and roasted soybean flour by changing free fatty acid composition during storage period when packing material and storage temperature are different.

[Materials and Methods]

Saedanbaek variety of raw and roasted soybean flour were packed with two types of packaging materials, polyethylene and polypropylene films bags. The raw soybean flour and roasted soybean flour were stored at 4°C, 20°C (as a control) and 45°C for 1 year, respectively. Fatty acids of raw soybean flour and roasted soybean flour were analyzed by selecting initial, 1, 2, 4, 8, 12, 24, 36 and 48 weeks during storage period. Fatty acid extraction : The FAs in 50 mg soybean flour was converted to the FAMES using heptane and methylation solvent (MeOH : benzene : DMP : H₂SO₄ = 39:20:5:2, v/v/v/v). Pentadecanoic acid was used as an internal standard and analyzed using GC-FID.

[Results and Discussions]

Linoleic acid was the most abundant in 45% ~ 53% of the raw soybean flour and roasted soybean flour. Oleic acid was the second most abundant with about 25%, parmitic acid was the third with about 11% and α -linolenic acid was about 8%. These four fatty acids account for more than 90% of total fatty acids. Due to the decrease in unsaturated fatty acids, notably linoleic acid, total fatty acids were significantly decreased at 24 weeks in roasted soybean flour stored at high temperature in polyethylene film and polypropylene film as compared to control and low temperature. Since we have looked at the long-term trends over a year, this study will help understand the use of free fatty acids as an indicator of the quality change of the flour during the distribution process.

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