Thesis Title	Studies on Factors Affecting the Yield and Quality of Soy-curd
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Abstract

Packaged tofu is soybean protein product and has the characteristic of semi-solid. The curd is obtained by coagulation protein of soymilk with coagulants. The interaction of protein molecule constructs a network structure called 'gel'. This study investigates the factors affecting the yield and quality of packaged tofu.

The first factor was soaking temperature. After soaking at 5° C for 3 hr, the weight of soaked soybean was maintained at 2.0 ± 0.16 times of dry bean weight. The amount of total soluble solid extracted was high and resulting gel was rigid and elastic. The effect of $NaHCO_3$ (1-3 %) in the soaking water was studied. The result shows that the soymilk has less bean flavor and good color when soaking water contained $NaHCO_3$. However, gel from those soymilks could not form when using 1 % of gluconodeltalactone (GDL) as coagulant. pH of soymilk was increased when added $NaHCO_3$ in soaking water. This causes the excess of anion compared with available protorn from GDL (1 %) . Yield and quality of soy-curd from three varieties of soybean (SJ. 4, SJ. 5 and Changmai 60) were studied. The result shows that protein extracted and total soluble solid of soymilk from SJ. 4 were remarkably higher than those of other varieties. Respect to the chemical omposition, the resulting gels from SJ. 4 were stiff and elastic. The effect of heating temperature on gel formation when using GDL or $CaSO_4$ as coagulants was examined. The present study found that the optimum

temperature for soymilk contained GDL or $CaSO_4$ to form rigid and elastic gel in plactic bag was 90-95° C.

The relationship between water : bean ratio and type or concentration of coagulant on the quality of packaged tofu was elucidated. If coagulant GDL was greater than 1.2 % or $CaSO_4$ was greater than 2.5 % (dry bean), the packaged tofu was bitter. If the water : bean ratio was less than 4:1, loss of extracted protein was high. As well as, the water : bean ratio was greater than 8:1, amount of extracted protein was not enough to form gel by 1.2 % GDL or 2.5 % $CaSO_4$. In sprite of the same coagulant concentration, if the water : bean ratio increased, the resulting gels became softer. Electron micrograph revealed that network structure of soft gels were composed of small aggregates forming less developed and less compact structure. At the same water : bean ratio, however, the increase of coagulant concentration increased the gel strength. Microstructure of stiff and elastic gel were composed of large aggregates forming developed and compact structure.

The difference between gels formed by GDL and $CaSO_4$ were analyzed by compression test. The texture analysis show that there were no significant difference between gel formed by 1 % GDL and 1.5 % $CaSO_4$ when water : bean ratio was 5:1. Microstructure from electron micrographs of both gels were similar. The panelist could not distinguish the difference between GDL and $CaSO_4$ gel. From the present study, the desirable gel strength can be achieved by using correlation of water : bean ratio and coagulant concentration.