

Effect of Salts on the Hardness of Cooked Beans(I)

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Summary

The effect of salts in soak solution on the hardness of cooked beans was determined with new soybeans and aged soybeans. Beans were soaked in a salt solution, cooked in distilled water, ground with a homogenizer and the resulting slurry was sieved. The dry weight of the residue on the sieve was measured and the relative hardness was expressed as percent to that of beans soaked in distilled water. For new soybeans, bicarbonates showed a prominent effect of softening. Tri- and dicarboxylates such as sodium citrate, sodium fumarate and sodium oxalate were more effective than monocarboxylates such as sodium lactate and sodium acetate. The chlorides of alkali metal and ferrous chloride softened the beans, but their effect was not so great as bicarbonates or polycarboxylates. On the other hand, the chlorides of alkaline earth metals hardened the beans. For aged soybeans, bicarbonates and sodium oxalate exerted more marked effect than for new soybeans.

The softening effect of sodium chloride was enhanced when soybeans were previously soaked in ferrous solutions. When the beans were soaked first in the sodium chloride solution and then in the ferrous solutions, the synergistic action was not observed.

The calcium contents of beans soaked in salt solutions were closely correlated with the cooked hardness except for the cases of ferrous chloride, magnesium chloride and bicarbonates.

Aged soybeans leaked more calcium ions on soaking in water than new soybeans, but they cooked more slowly.