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Protein extraction of soybean, cowpea and fishmeal with different agitation speed

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Many methods to extract protein from raw ingredients have been used due to increase of its use in foods to provide better healthy and functional properties to consumers. Usually, the protein is denaturalized from protein body in the seeds of defatted flour by pH increase, and its soluble protein is precipitated by pH decrease. Denaturation process is a critical to separate protein from protein body; therefore, physical agitation speed would contribute the protein extraction rate.

Our object was to demonstration that higher agitation speed can significantly increase the extraction rate of soluble protein in solutions containing flours of soybean, cowpea and fishmeal.

Flours (500g) passed through a 20-mesh sieve were mixed with 5L of 0.15M NaCl solution for 1 hour and then adjusted pH 9.91 with 5M NaOH for 30 minutes to extract protein in the slurry. The slurries were agitated at two different speeds (1,000 and 6,000 rpm).

Protein was extracted 55%, 38% and 24% at low (1,000 rpm), and 78%, 68% and 36% at high (6,000 rpm) agitation speed on soybean, cowpea and fishmeal, respectively, when compared to the initial flours. Extraction rate with soybean was the highest on both agitation speed, but extraction rate of cowpea at high agitation had a higher extraction rate (79%) compared to its rate at low agitation.

High-yield extraction was achieved by high agitation speed. Therefore, agitation speed plays a significant role for protein extraction.

Biography

Taehoon Kim is pursuing PhD degree in the Food Science and Technology program of Nutrition and Food Science at Texas A&M University since spring 2011. He has studied in separation technology using membrane. He has studied extraction and purification of protein from raw ingredients for commercial use used microfiltration and ultrafiltration. In addition, His specialty area is processing of cereal using extrusion technology. He is developing a model for predicting a breakfast cereal based on fundamental empirical parameters of sorghum and cowpea, including carbohydrate and protein composition and structure, among others with extrusion process.

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