

Effect of Particle Size on Extraction, Clarification and Membrane Separation of Soy Proteins.

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Soy protein is a high quality protein which is used extensively in a variety of foods such as cereals, juices & drinks, meats, dairy, deserts, vegetarian foods etc. Soy protein has been proven to provide health benefits like reduced risk of heart disease, weight management and child nutrition. Soy proteins are classified based on the protein content in them as isolates (90%), concentrates (atleast 65%) and textured proteins (52%). Soy protein concentrate was made by a series of steps, extracting the soy protein from white flakes using water, removing the fiber using solid bowl centrifuge, further concentrating the extract to >80% (solids) soy protein by membrane separation. The particle size of the white flakes used during extraction was a key to increase the extraction efficiency, there by the overall yield of the process. A grinder was used to decrease the particle size. A lower particle size gives increased surface area which leads to better extraction efficiency. However due to grinding, additional fines would be created which could harm the membrane performance. A centrifuge was used as a clarifier to remove the additional fines and decrease the volume solids of the extract to the same level as that of the extract obtained from unground white flakes. The protein extraction efficiency was improved 12% by decreasing the particle size to 50% of the unground flakes. The overall yield was measured as the change in spent flake protein during extraction. The yield was then adjusted for the protein loss during shoots across the clarification step. The data indicated that the gain in the yield due to better extraction was offset due to the loss across the clarification step. The membrane flux (LMH/bar) did not deteriorate and was comparable to the one when using unground flakes.