381f Concentration of Whey Solutions by Foam Fractionation

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Recent studies have shown that whey proteins serve a variety of useful purposes from improving flavor in meat to improving the texture of ice cream. During cheese production a large volume of whey is produced which is typically considered a waste stream. Recovery of whey solution from this waste stream via concentration would not only reduce waste disposal costs but also provide for a valuable co-processing stream. Adsorptive bubble separation techniques like foam fractionation offer a cheap and simple way to recover high value components from industrial waste solutions. In foam fractionation, gas is bubbled through a dilute protein solution and the proteins adhere to the rising bubbles. The foam thus obtained is a protein rich solution. The goal of the current study is to examine the use of foam fractionation to reduce the volume of whey wastes from dairy industry via concentration. A design of experiments strategy using response surface methodology is used to investigate the influence of feed concentration, pH, and flow rate on the foaming performance. Since the whey solutions are composed of several component proteins (á-lactalbumin, â-lactoglobulin, BSA, etc), the results are discussed in the light of their relative separation efficiencies.