

Effects of Processing Treatment and Cheese-Making Parameters on Foaming Properties of Whey Protein Isolates

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Acid whey from raw milk, acid whey from pasteurized milk, and sweet whey from Cheddar cheese making were prepared from one batch of milk. Each whey was dialyzed and freeze-dried to produce a whey protein isolate containing <90% protein on a dry basis. Foaming characteristics (overrun and foam stability) of aqueous solutions (5% protein, pH 7.0) of each whey protein isolate were measured. Foaming characteristics were poor for whey protein isolate prepared from untreated acid whey and sweet whey. Following centrifugation to remove insoluble foam depressants, the foaming characteristics of whey protein isolate prepared from acid whey and sweet whey were improved slightly. Following centrifugation plus microfiltration of the acid and sweet whey protein isolates with cellulosic membranes (.22- μ m), the overrun and foam stability were greatly improved, very consistent, and comparable with the foaming properties of egg white and commercial whey protein isolate, in spite of fat contents of 2 to 4% on a dry basis. Whey pasteurization and cheese-making parameters (i.e., coagulant, starter media, color, and bleaching agent) did not influence the foaming characteristics of whey protein isolate. Microfiltered acid whey protein isolate and sweet whey protein isolate had very different glycomacropeptide contents but similar foaming properties. The foam depressant in whey originates from raw milk.

Key Words: whey protein isolate • foaming properties • microfiltration • foam depressant

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