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Whey protein concentrate (WPC) production: Environmental impact assessment

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Abstract

Cheese-making is a process that produces multiple coproducts, of which whey is the most abundant in terms of volume. It is often considered a waste product, but whey is rich in lactose, proteins and fats. The aim of the study was to evaluate the environmental impact of the production of whey protein concentrate (WPC) with an ultrafiltration process throughout a life cycle approach. The environmental impacts of three WPCs, characterized by different protein concentrations (WPC35, WPC60, WPC80), were estimated. A scenario analysis was performed to understand the mitigation effect of the pre-concentration process carried out in a pretreatment plant to obtain whey with a dry matter content of 20%. Two sensitivity analyses were performed: the first changing the transport distance of whey, the second using a different allocation method.