

Selection and Definition of the Operational Conditions for the Removal of Lactose from Whey by Ion Exchange

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Whey is a by-product obtained from milk after casein curd separation during cheese manufacture, representing 90% of the milk volume used in the process – to produce 1 kg of cheese 10 litres of milk are used, being produced 9 litres of whey. Due to its composition, this effluent has a high BOD and consequently its environmental impact is considerable [1]. In Portugal 1 000 000 litres of cheese whey are produced daily. One of the most attractive ways to minimise this effect is to recover the main components of the whey – lactose (5% w/v) and protein (1% w/v) –, thus adding value to a food industry by-product [2, 3]. Cheese whey proteins - α -lactalbumin and β -lactoglobulin – due to its excellent functional and nutritional properties have a wide range of industrial applications such as sport drinks, baby foods, fortified fruit juices, meat products, desserts and other confectionery products [4]. To take full advantage of its properties, protein concentrates with low fat and lactose contents are needed. So far, two main alternatives have been considered for lactose removal – ultrafiltration coupled with diafiltration and ionic exchange processes [3]. In this work, several ion exchange resins were assayed for whey deproteinization. Since protein charge is, mainly, controlled by pH, results on optimal pH for proteins sorption and desorption are presented as well as data on contact time between cheese whey and resin and on the volume ratio between cheese whey and resin.

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