UTILIZATION OF ELECTROPHORESIS (SDS-PAGE) FOR MONITORING THE CONCENTRATION AND FRACTIONATION OF WHEY PROTEIN USING ULTRAFILTRATION PROCESS

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Whey is a byproduct generated in large quantities from the cheese-making dairy industry and its proteins are known for the versatility and nutritional value as described by the numerous applications in industries. Several technologies are being implemented in order to concentrate, separate and purify these proteins. The main niche markets are the food and pharmaceutical industries. Thus, there is a need to develop methods that can help to monitor the achievement of these proteins. The aim of this study was to monitoring the protein profile using electrophoresis (SDS-PAGE) and a colorimetric method of protein analysis (Bradford) through an ultrafiltration process, evaluating the feed (FE), retained (RE), and eluted (EL) fractions. In a 15% acrylamide-electrophoresis gel, it was possible to observe 14 polypeptide-chains, both in FE, and RE. In EL it was only detected 2 polypeptide-chains, of small molecular masses, corresponding to the α-lactoalbumin (18 kDa) and β- lactoglobulin (14 kDa), the most abundant proteins in whey. Therefore, the 20 kDa cut off membrane was effective in the partial fractionation of the proteins. The total protein concentration in FE was of 2.82 mg/mL, and in RE of 4.96 mg/mL, as expected once the membrane function was to concentrate the proteins. In EL, the total protein concentration was lower (0.19 mg/mL), but with a more purified profile. It is concluded that the processing conditions used in this work may be useful for different industrial applications, and the method of electrophoresis (SDS-PAGE) was efficient in monitoring the protein profiles of the process.