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**FACTORS AFFECTING THE CLEANING EFFICIENCY OF  
POLYSULPHONE MEMBRANES AFTER CREAM ULTRAFILTRATION**

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**ABSTRACT**

Improvement in cleaning of polysulphone membranes after ultrafiltration of cream on a commercial production plant has been evaluated. The nature and composition of the liquid feed stream have a great influence on the degree of membrane fouling, and its subsequent cleaning. After ultrafiltration of cream with a fat content >10% different membrane cleaning protocols were tested. The three cleaning procedures included an alkali, acid and enzymatic steps, and differed in the order at which these steps were applied.

Water flux and performance of the membranes during the following day's production were monitored after each cleaning protocol. When the cleaning procedure included an enzymatic, alkali, acid and a further alkali step, average water fluxes of 88 % were obtained. However, when the protocol consisted of an alkali, acid, overnight soak of the membranes in enzyme solution and further alkali step water fluxes of 80 % were observed.

In contrast, average water fluxes of 50 % were obtained when an alkali, with a lower alkali strength, and an alkali clean, containing a surfactant, followed by an acid, enzymatic overnight soak and alkali clean were applied.

Considerable day-to-day variation in the effectiveness of the cleaning regimes was encountered. When water fluxes were below 80 % a further alkali, acid or even enzyme treatment had to be applied in order to improve such levels.

In addition, changes in temperature and feed pressure during ultrafiltration of the cream gave rise to differences in levels of fouling and subsequent effectiveness of cleaning. In particular, a temperature drop during processing led to more severe fouling.