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**EFFECT OF PREHEATING ON FOULING OF UHT STERILIZING PLANTS BY FRESH, RECOMBINED AND RECONSTITUTED WHOLE MILK**

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**ABSTRACT**

The literature contains conflicting evidence for the effect of milk preheating on fouling of UHT sterilizing plants by whole milk. This study was carried out to address this, and, further, to discover whether or not there were differences in the response to preheat treatment between fresh and recombined milk. In each of three extensive experiments the fouling behaviour of fresh whole milk, recombined whole milk (from skim milk powder and milk fat) and reconstituted whole milk (from whole milk powder) was measured. In each experiment the fresh milk, the skim milk powder and the whole milk powder all originated from the same original batch of fresh milk. Fouling rates were measured in the high temperature section of a pilot-scale indirect (plate heat exchanger-equipped) UHT plant. The fouling rate was evaluated as the rate of increase of the difference between the heating medium (hot water) inlet temperature and the milk outlet temperature (controlled to 140°C). The effects of preheating conditions were compared as follows: UHT preheating conditions (fresh and recombined milk): 75°C 11 s, 85°C 147 s, 95°C 147 s; evaporator preheating conditions in skim milk powder manufacture: 75°C 2 s, 85°C 155 s, 95°C 155 s. The evaporator preheating conditions in whole milk powder manufacture (95°C, 20s) were not varied. In all cases it was found that the more severe the preheat treatment, either prior to evaporation during milk powder manufacture or prior to UHT treatment, the higher were the fouling rates. This trend was the same for fresh as well as recombined milk. Findings are contrasted with those of previous relevant investigations.