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**FACTORS AFFECTING HEAT TRANSFER
IN THE FALLING FILM EVAPORATOR**

A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE
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Abstract

A pilot scale single-tube falling film evaporator made of stainless steel (2 metres length) was used to gain some understanding of the mechanism of evaporation in this type of evaporator.

Results obtained from commercial milk evaporators were used to select operating conditions on the pilot evaporator. The study was carried out using the simple liquids: water and sugar solutions.

It was found that the overall heat transfer coefficient decreased with increase of the overall temperature difference. The rate of decrease of the overall heat transfer coefficient is more rapidly in the range of 3-8 °C than in that of 8-18 °C.

The dependence of the overall heat transfer coefficient on the evaporating temperature was observed in the range of 70 °C to 90 °C.

The longer the heating tube length, the lower the overall heat transfer coefficient on this pilot evaporator.

The relationship of the overall heat transfer coefficient with average Reynolds number and liquid viscosity obtained was:

$$U = 0.939 + 1.58 \times 10^{-3}Re - 3.5 \times 10^{-7}Re^2 + 6.45 \times 10^{-4}\mu$$

$$(R^2 = 97.8 \%)$$

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