

**Analysis of the heat transfer coefficient for liquid nitrogen droplets in cryogenic freezing of foods: Analyse du coefficient de transfert de chaleur de gouttelettes d'azote liquide dans des conditions de cryocongélation des aliments**

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**Abstract**

An analysis of the heat transfer coefficient of liquid droplets evaporating on a food slab surface has been made in relation to cryogenic freezing of foods. The effects of heat transfer coefficients at the top and bottom surfaces of the evaporating droplets were determined. It has been shown that the heat transfer from the top surface of the droplets has a significant effect on the overall heat transfer coefficient of these droplets and that maximum extraction of heat from the food surface occurs at the bottom of the droplets. The results obtained from several tests were consistent and repeatability was good. The data obtained are in agreement with those reported in the literature and useful suggestions for higher freezing rates are discussed in relation to the commercial practice of cryogenic freezing.

**Keywords:** liquid nitrogen; heat transfer coefficient; cryogenic freezers