

# Vacuum-assisted freeze concentration of sucrose solutions

*Petzold, G., Niranjana, K., & Aguilera, J. M. (2013). Vacuum-assisted freeze concentration of sucrose solutions. Journal of Food Engineering, 115(3), 357-361.*

## Abstract:

Freeze concentration in a one-step configuration has emerged as an interesting alternative to conventional processes in terms of both the construction and operation of the equipment. For vacuum-assisted freeze concentration reported in this study, vacuum was used as the driving force to remove the concentrated solution from the ice matrix. By applying a vacuum (80 kPa), the efficiency of the freeze concentration was significantly improved over atmospheric conditions showing an evident advantage in terms of the process time (which was one-third of the time required for atmospheric treatments), and a higher recovery of solute, approximately 0.5 kg of sucrose obtained per 1 kg of initial sucrose compared to recovery values ranging from 0.16 to 0.3 kg/kg for atmospheric treatments. A better performance of vacuum-assisted freeze concentration may be attributed to the structure of the frozen phase which acted as a porous solid matrix allowing the flow of the concentrated solution.

**Keywords:** Vacuum | Porous matrix | Freeze concentration | Efficiency Concentrate

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