

Food Process Engineering-II 3(2-1)

Theory

Food engineering: trends. Properties of foods: physical, colligative, rheological, engineering. Microstructural and imaging analysis as related to food engineering. Heat transfer in food: heat measurement, transfer and control; steam and its use in industry. Applications of refrigeration and freezing: principles, insulation, cold storages - design, equipment, applications. Sterilization, evaporation, drying, pasteurizing. Engineering properties of packaging materials: diffusion through membrane, gas permeation mechanism. Materials handling: equipments. Energy for food engineering: steam, fuel utilization, electric power utilization, thermodynamic laws, energy balance for open systems, dynamic response of sensors.

Practical

Determination of depression in freezing point, surface tension and absolute viscosity of given fluids. Determination of freezing time for food products using Plank's equation. Verification of Stokes law. Selection of pumps and fans using characteristic curves. Determination of thermal conductivity of food materials. Determination of overall heat transfer coefficient of shell and tube heat exchangers. Calculation of thermal process time of foods packed in containers.

Books Recommended

1. Pandey, H., Sharma, H.K., Chauhan, R.C., Sarkar, B.C. and Bera, M.B. 2004. Experiments in food process engineering. CBS Publishers, New Delhi, India.
2. Sahay, K.K. and Singh, K.K. 2001. Unit operations of agricultural processing. Vikas Pub. House, New Delhi, India.
3. Barbosa-Canovas, G.V., Fito, P. and Ortega-Rodriguez, E. 1997. Food engineering 2000, Springer Verlag, Heidelberg, Germany.
4. Farrall, W. 1993. Engineering for dairy and food products. John Wiley & Sons Inc., New York, USA.

Website: www.foodscienceuniverse.com