Title Heat transfer during forced air precooling of perishable food products

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Abstract

An experimental investigation has been carried out to study the heat transfer during forced air precooling of orange and tomato at different cooling velocities of cold air at 4–5 °C. The air velocity has been varied from 1.2 to 4.4 m s^{-1}. It was found that air velocity had significant bearing on the cooling rates of food products below the dimensionless temperature, $\mp$, of 0.6. The limiting cooling air velocity for orange was 3.5 m s^{-1} and that for tomato was 2.6 m s^{-1}. The increase in cooling air velocity beyond the above values did not affect the cooling rate significantly. The heat transfer coefficient, *h*, during cooling of tomato was higher than that for the cooling of orange by between 9 and 30 per cent. A correlation has been developed to predict the heat transfer coefficient, *h*, for different velocities of cooling air. This correlation predicts the experimental results in an error band of ±7.5 per cent.