

Title Design guidelines for the forced-air cooling process of strawberries
Author M.J. Ferrua and R.P. Singh
Citation International Journal of Refrigeration, Volume 32, Issue 8, December 2009, Pages 1932-1943
Keywords Strawberry; Modelling; Simulation; Cooling; Ventilation; Forced convection; Packaging

Abstract

The complex structure of the package systems currently used by the strawberry industry has prevented an efficient design of the forced-air cooling process. In this study, we investigated the mechanisms through which different design parameters affect the rate and uniformity of cooling, using a previously validated computational fluid dynamics model. The results indicated that the vent area has a significant effect on the cooling rate, but not on its uniformity. A design that reduces bypassing will not necessarily increase the cooling rate, because there is less bypass air to cool down the air exiting from each clamshell, so that the air entering the next clamshell becomes warmer. Periodic airflow reversal improves the rate and homogeneity of the cooling process.