

**Title** Modeling psychrometric data in real-time fruit logistics monitoring  
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### **Abstract**

Progress in fruit logistics requires an increasing number of measurements to be performed in refrigerated chambers and during transport. Fruits and vegetables are submitted to a variety of risks during transport and storage that are responsible for material quality losses. Among them water loss and condensation are causes of deterioration that reduces the marketability of fresh fruits and vegetables. Wireless sensor networks (WSN) are a promising solution in monitoring food logistics. Instrumented with sensors, such as temperature and humidity, this technology allows on-line supply chain monitoring of perishable food products. Psychrometry studies the thermodynamic properties of moist air and the use of these properties to analyze conditions and processes involving moist air. Using the information provided by the sensors, psychrometric equations can be used for quick assessment of changes in the absolute water content of air, allowing estimation of future water loss and detection of condensation. In this paper the psychrometric data from ASABE (American Society of Agricultural and Biological Engineers) has been applied, for modeling evaporation and condensation of water related with regard to product in a refrigerated chamber. The experiments were conducted in a commercial wholesaler store in the fruit and vegetables wholesalers market of Madrid. Two different types of IEEE 802.15.4/ ZigBee motes have been used.