

**Title** Smart traceability systems to satisfy consumer expectations  
**Author** Maarten L.A.T.M. Hertog, Ronald Frederic, Peter Snoekx and Bart M. Nicolai  
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### **Abstract**

Quality of horticultural produce is based on consumer evaluation of a complex of quality attributes, related to specific product properties. These product properties change with time, as part of normal product metabolism. Final quality of horticultural produce is the combined result of efforts by the grower, the distributor, and retailer. This emphasises the need for an integrated approach to optimise conditions throughout the supply chain as a whole. To this end, a prototype of an intelligent traceability systems is being developed using tomato as an example. Traditional traceability systems are mainly identification systems. The generated information is of a static nature and does not contain dynamic information. Process conditions are relatively easy to measure but continuously measuring product quality is often not feasible. However, quality change models can be used to predict product quality and the measured conditions. Quality change models can be integrated with traceability systems to lift these administrative tools to the level of decision support systems accounting for the quality of the product going through the chain. This contribution focuses on implementation and validation of a smart traceability systems for tomato. Tomatoes were stored at dynamically changing temperature conditions to validate the quality change model. Belgian tomato chains were monitored from grower to retail using radio frequency (RFID) labels with integrated temperature sensors. The monitored temperature scenarios were simulated to further validate the quality change model. Finally batches of product were identified and characterised at the growers' farm, the product was monitored during transport with RFID labels and recovered after going through the marketing chains. Experimental results are presented outlining the potential benefits of integrating quality change models with traceability systems to satisfy consumer expectations.