Reducing Food Losses: **FEFO Inventory Control**

In our last blog we discussed how – while 1 billion people in the world are undernourished – 30-40% of food (primarily perishable products) is lost or wasted. We described how a holistic approach to cold chain management – from the field to the supermarket shelf – can dramatically reduce the loss of perishable products. In this blog we will examine the importance of FEFO (First Expired First Out) inventory management in the cold chain in order to reduce food losses. Simply put, FEFO is an inventory management methodology that allows for products with the shortest shelf life to be distributed first. As noted in the June 2014 article “Reducing food losses by intelligent food logistics” published by Jedermann et al in the Philosophical Transactions of the Royal Society A, it is important that ‘shelf life’ not be confused with a fixed ‘best-before’ or ‘use-by’ date. Shelf life is a dynamic value that gives the time span for which the product, if stored at a certain reference environment including temperature, will still meet the quality requirements for purchase and consumption.

Accurate, reliable assessment of a product’s shelf life is key to FEFO inventory management. In the article cited above, the authors state clearly “**Owing to the lack of automated data capture and shelf life calculation systems to perform this task, FEFO has found very little practical application so far**” (our emphasis).

There is no question that providing an automated food quality supervision/assessment system is a challenging task. It requires a highly multidisciplinary approach, bringing together expertise in the fields of sensor systems, communications, predictive biology and food technology – not to mention deep knowledge of cold chain logistics. It means tracking the relevant quality parameters seamlessly, and analyzing the data in a dynamic algorithm that can take into account – in real-time – new information that impacts on a product’s shelf life. But, as illustrated by the chart on the right, controlled studies conducted by the Intelligent Container project clearly show that **FEFO inventory control**, based on reliable assessments of product shelf life, **significantly reduces the loss of perishable products**.

BT9’s Xsense® cold chain management system facilitates FEFO inventory control by automatically tracking, throughout the cold chain, the two parameters most closely associated with product shelf life, i.e., temperature and relative humidity (RH). Whenever a shipment arrives at its next destination, Xsense® automatically sends arrival notifications with a Cold Chain Logistic (CCL) score and a Pallet At Risk (PAR) indication for each pallet – calculated from the tracked data by a complex, proprietary algorithm.

**Armed with these product quality scores, every stakeholder along the cold chain can implement FEFO inventory control – and significantly reduce food losses.**