PROJECT TITLE

Process Analytical Technology for 'near real time' Holistic process control in Food products, using advance data management and information technology tools (FoodPATH)

CLIENT

Food Industries

OUR TEAM

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THE PROBLEM & THE NEED

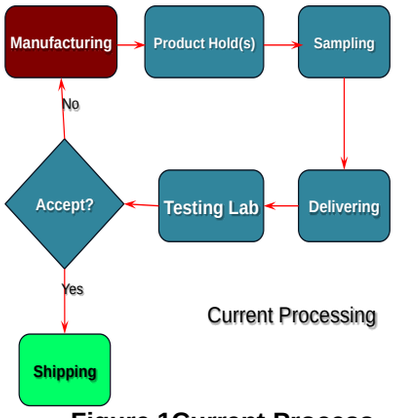

Figure 1Current Process

The current practice **(Fig.1)** to meet the demands of EU legislation 2073/2005, address these issues and to assure the safety of food ***still relies heavily on regulatory inspection and sampling regimes***. This approach, however, seems inadequate because it cannot sufficiently guarantee consumer protection since 100% inspection and sampling is ***technically, financially and logistically impossible***. On the other hand, the food needs rapid, non-invasive and, if possible, hand-held analytical instruments/ methods that can be used ***on-line, in-line or at-line*** and can ensure that raw and in process materials are both of good quality and safety while food losses are minimized.

SOLUTION: Addressing the problem and the need

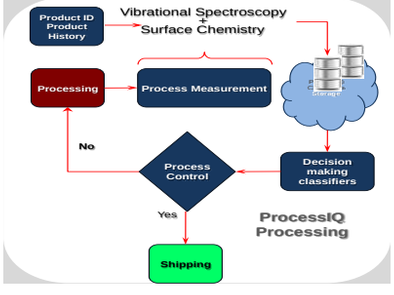

Figure 2 Proposed Process

Given the above, it is an industrial requirement to coordinate and reinforce European research to develop and implement "**a generalized system/strategy"** that will be designed to "*analyse and control manufacturing through timely measurements, i.e., during processing those critical quality and performance attributes of raw and in-process materials and processes with the optimum goal of ensuring final product quality and safety* **(Fig.2)** ", while understanding and controlling the food processes should also be feasible.

RESULTS

Data collected from either vibrational spectroscopy (e.g. FTIR, RAMAN), as well as surface chemistry (hyperspectral / multispectral imaging) instruments combined with appropriate machine learning strategies (for example partial least squares regression, artificial neural networks) could become an interesting tool to

(i) monitor food spoilage/freshness through the measurement of biochemical changes occurring in food substrate, without the history of sample to be known (e.g. temperature of storage, the initial contamination, pH)
(ii) quantify certain compounds e.g. fat, proteins that are of great importance for the food industry from the quality as well as from nutritional point of view.

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