



Consumer training for novel smart packaging benefits and application for frozen food cold chain monitoring

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Introduction

Application of an optimized cold chain management system for frozen products can be assisted by monitoring with Time Temperature Integrators (TTI). TTIs cumulatively show the product history in an easily measurable, time-temperature dependent change (Taoukis & Labuza, 2003). Enzymatic and photochemical TTI were developed and tested for frozen products in the IQ-Freshlabel FP7 European project. Methodology was developed for selection of the optimum TTI design of specific frozen fish products and their application was validated in cold chain simulating trials and in pilot studies (Giannoglou et al., 2014). A TTI based system could lead to realistic control of the cold chain, optimization of stock rotation and reduction of waste and efficient shelf life management.

This work further to the technical objectives, aimed to increase consumer confidence in the food supply by improving the awareness in the scientific and technological basis for ensuring traceability along the entire food chain. Training activities intended to educate the stakeholders regarding the properties of the developed TTIs and their utilisation within food packaging, transport, storage and sale. Training activities towards consumer associations focused on information about the use and benefits from TTIs application. Training material was developed, including an informative brochure, PowerPoint presentations and printed tutorials.

Training activities were also dedicated to the participating consumer associations as well as to the test groups of consumers and retailers, providing them with information about the use and benefits from TTIs application. Moreover, the consumer and retailer associations contributed to the successful evaluation of the understanding and expectation towards currently available smart labels by their members. That outcome influenced the design of the innovative intelligent labels.



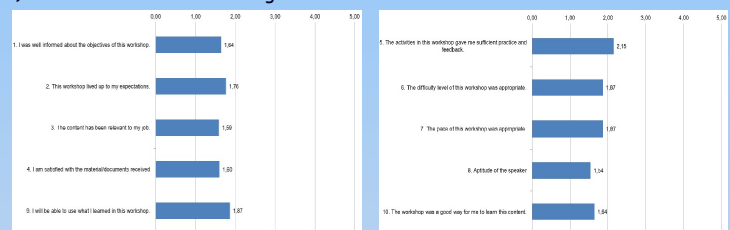
All trainees received a leaflet developed specially to address consumers and were asked to fill an evaluation form for the training workshop.

The training sessions for consumers provided information on the following topics:

- ✓ Comprehensive assessment of the requirements for the upcoming EC regulations affecting the traceability of the cold chain within the meat and fish processing sector.
- ✓ Technological principle and properties of TTI and information material about the characteristics of the developed IQ-Freshlabel labels starting with the project website and the project leaflet.
- ✓ The consumer's attitudes towards TTIs, based on the consumer studies of IQ-Freshlabel project.
- ✓ The role of industry and the retail management aspect on food chain control and stakeholder's attitude towards TTI.

Evaluation of the consumer's training

All trainees filled an evaluation form for the training Workshops. The training organized by EKPIZO for consumers in Greece was evaluated by the attendees as "good" with an average evaluation mark of 1,75 on a scale from 1 (very good) to 5 (very bad). The content of the training was evaluated as follows:



The attendees considered that the high quality of the workshop is due to both the examples presented and the CD with training material and presentations distributed as well as to the discussion at the end of the workshop where different opinions were presented and discussed regarding Current legislation, Labelling issues, Smart labels.

Additionally the consumers attending the training suggested adding practical exercises regarding TTI use and application as well as examples about TTI application in different countries to allow better interaction with participants. The consumers wished more time for discussion and questions. Moreover the consumers are interested about financial issues regarding TTI application.

Consumers' acceptance study

The training material and the content of the workshops was built taking into account the outcome of previous consumer acceptance studies conducted within IQ-Freshlabel project.

The consumer study results showed that TTI technology is promising from consumers' perspective. It is found useful, it is a good tool to monitor both external and consumer's own cold chain and it increases trust in food chain in each country. Despite the promising results, there is still need for further work before the technology is ready to be implemented.

First of all, consumers need education. Both qualitative and quantitative study showed that consumers have difficulties to understand how to adapt TTI message to their own behaviour. This is caused by the intermediate colours and also other freshness labels which might be in conflict with TTI. As food is a sensitive matter to consumers, such confusion is neither needed nor wanted.

Secondly, the current TTI applications are (from consumers' opinion) vulnerable to manipulation as they considered that retailers would anyway change the "bad TTIs" to "good TTIs". The reason for this was that TTIs are not integrated in packaging. As TTI in general was appreciated as a technology which allows consumers to monitor food chain, this feature of the technology undermines the added value almost completely. Thus, a solution to this problem should be considered carefully.

Smart Labels' Training for Consumers in Athens

The key objective of the workshop was to educate the EKPIZO members (consumers) about the concept and application of TTIs for chilled and frozen products. 130 participants were trained.

The main results obtained within the IQ-Freshlabel project were presented. Consumer's training included the current and oncoming legislation regarding food labeling and on package shelf life dates, the role of industry in the control of food chain conditions, consumer's, producer's and retailer's attitudes towards TTI application. As a result, opinion exchange took place during the workshop and it was a good opportunity to discuss consumers' perspectives regarding the application of smart labels and the needs for TTI implementation.

References

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