

Development of an intelligent (packaging) system for a sensor-based prediction of the actual expiration date of food

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Introduction

Food- and packaging waste is a major issue in food production, storage, retail to final consumer behavior and adds up within the EU on yearly more than 140 billion €. The marked expiration date of dairy food on packaging is often only indicative for actual expiration (food quality and safety). Therefore, food and packaging waste regularly occurs.

Aim

This project focuses on the concept development for the whole value chain of ESL-milk by creating an algorithm for predicting actual food expiration dates. The algorithm will be based on various quality tests during real-life storing conditions, so that the life-cycle period of ESL-milk depending on external influence factors (i.e. temperature, light intensity etc.) can be determined.

Methods

These data are used as a starting point for programming a smartphone-app to monitor and demonstrate e.g. current product states, predicted actual expiration date, its origin and ingredients to the user in a compact, individual manner.

Results

Substantial contents of the project are (1) specific determination of influence and impact of temperature on overall life-cycle of ESL-Milk, (2) development of an algorithm for prediction of actual and real expiration dates, (3) development of a reusable sensor label for collecting necessary data, (4) development of a cloud-based smartphone app for the evaluation and analysis of the recorded datasets, (5) compilation of a guideline for the practical use of this developed system, as well as in (6) combination with an economic efficiency calculation and analysis based on technical project results.

Conclusion

The developed app will help consumers, retail and food producers to monitor the actual shelf-life of food products (first step will be in dairy), thus reducing dairy food waste, solely based on indicated product expiration dates on the packaging. This application might be as well feasible and to be rolled-out for other food categories.