

Fresh on Demand



WAGENINGEN
UNIVERSITY & RESEARCH



How do you maintain high product quality of fruit and vegetables while reducing the use of chemical pesticides and environmentally harmful packaging? How do cooperating parties in the chain ensure they can continue supplying fresh, high-quality products? And to what extent can this increase consumption of fruit and vegetables? These and other research questions are examined in the Fresh on Demand project.

Consumers demand tasty, healthy and food-safe products sourced from a sustainable supply chain. In order to promote consumption, it is necessary to continually optimise fruit and vegetable chains. We are constantly striving for a sustainable supply chain and guaranteed product safety, while also guaranteeing product quality. Further chain integration and greater insight into the intrinsic chain quality is needed to deliver consistently high quality all year round, as well as limit losses in the chain. How can chain links best respond to current consumer wishes and requirements, and thus deliver 'Fresh on Demand'?

These developments create contradictions between quality preservation, food safety and sustainability measures. A good balance must be found between optimum quality, taste and risk of product loss due to safety and sustainability requirements. The aim of this project is to optimally attune fresh produce chains to consumer needs, taking into account food safety and sustainability requirements. In this way, the project contributes to the desired increase in fruit and vegetable consumption.

Smart chain concept

The participants in this project are working on:

- the development of knowledge on physiological quality
- measurement and detection methods for a wide range of quality issues (from spoilage to taste)
- smart, targeted use of quality information and other information from the chain
- tools to meet current and future food safety and sustainability needs

Improving intrinsic quality control: the *smart chain concept* is the starting point. Participants share this knowledge and these tools on a knowledge platform, so that after the end of the project, other companies can also be informed about the knowledge gained.

Seven sub-projects

The Fresh on Demand project consists of the following sub-projects:

1 Biomarkers for quality

Research into an applicable measurement principle based on volatile substances (biomarkers) which can serve as an 'early-warning system', for instance. The research focuses on two product groups, hard fruit (pear) and soft fruit (red currant). The right biomarker measurements will ensure timely detection of negative quality developments, so that additional action can be taken to prevent product loss. Innovative sensor technology will be valued in order to measure/monitor relevant biomarkers in various chains.

2 Taste and non-destructive measurements

Increasing the consumption of fruit and vegetables by developing knowledge and tools that enable chains to guarantee consistent taste of fruit and vegetables. The effect of this is that purchases, and repeat purchases are stimulated. This research aims to develop a taste model for tomatoes based on non-destructive measurements. With this model, the taste of tomatoes can be measured objectively. Moreover, a taste model for apples will be developed as an alternative to expensive expert/consumer panels. With this model, the taste of apples can be measured objectively, based on a number of destructive measurements.

3 Intermodal transport of perishables by rail

Transport by train is a sustainable way to transport food. In this project, the reefer containers used for this purpose will be improved to enable rail transport for more products, to China, for example. Focus lies on the following products: onions, flower bulbs and bell peppers.

4 Optimising the tropical fruits chain quality

Research into optimised control of the tropical fruits chain quality. Papaya serves as a case study, with the aim of being able to offer a higher proportion of high quality, ready-to-eat fruit to retailers and/or consumers. In addition, strategies and methods are being developed to improve the shelf life of the incoming product in order to reduce losses.

5 Firm, tasty blueberries

Research into optimising the supply chain, from producers to consumers, with the aim of achieving consistent quality in the form of firm/crisp blueberries with excellent taste. Central to this approach is the

development of a measurement method for the quality (especially firmness and mealiness) of blueberries in the chain. In addition, the effect of the moment of harvest and chain conditions on quality will be investigated.

6 Food safety of sliced fruit and vegetables

Controlling *Listeria monocytogenes* (Lm) in fresh, ready-to-eat cut fruits and vegetables is challenging. Unprocessed fruits and vegetables are sporadically infected with Lm and the process does not include microbial inactivation. Onsite detection of Lm on raw materials, equipment and end products can contribute to faster identification of a possible source. In addition to the speed and low detection limits of the onsite test procedure, this procedure must also have the right degree of specificity to correctly identify Lm. In addition, this subproject aims to provide insight into the parameters to be used for the implementation of the current EURL guidelines for Lm challenge testing and the extent to which these affect the shelf life/best-before date.

7 Development of a dynamic packaging concept

This project deals with the current discussion surrounding the use of plastic packaging in the fruit and vegetable sector. Namely by developing a new bio-based film to be used as Modified Atmosphere (MA) packaging. The film will be fully recyclable. A major advantage is that this packaging provides a longer shelf life because the film is able to adjust its properties and functionality to temperature fluctuations in the chain. This dynamic packaging will be optimised, and the foil will be prepared for upscaling.



Interested?

The results of the Fresh on Demand project offer companies interesting opportunities, such as more control of chain quality, objective measurement methods, more sustainable business operations, insight into product physiology, quality and safety and also optimised chain integration.

Interested in how Fresh on Demand can precisely bolster your objectives? Feel free to contact us.

Fresh on Demand is co-financed by the Ministry of Agriculture, Nature and Food Quality (TKI, Top Consortia for Knowledge and Innovation), GroentenFruit Huis and an extensive group of private companies from growers to suppliers of sensors and technologies.



Contact information

Fátima Pereira da Silva

Project Leader of Fresh on Demand at Wageningen Food & Biobased Research

T +31 317 48 02 32

E fatima.pereiradasilva@wur.nl

www.wur.eu/freshondemand

