



LIFE Fresh Box - LIFE Fresh Box: a sustainable transport solution conserving quality of fresh produce, reducing waste & fuel consumption

LIFE13 ENV/ES/001362

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Project description:

Background

Fresh products, such as fruits and vegetables, are highly perishable. They therefore require rapid transportation and good storage after being harvested in order to maintain their physical, chemical and organoleptic properties.

Enhancing the shelf life of fresh produce can help avoid food waste during transportation/distribution and in households. Food waste in the EU amounts to an estimated 89 million tonnes/year, with 42% being generated in households (37 million tonnes/year). This has been estimated to equal 1.9 tonnes of CO₂ equivalent/tonne of food waste.

Internal EU trade of fruit and vegetables in 2010 represented around 27.2 million tonnes of products out of a total production of 76 million tonnes. Most goods are moved in Europe by truck (around 50%), 10% by train, 40 % by boat – with just a small fraction being transported by plane.

According to the European Commission, road transportation fuel consumption in 2009 was about 300 Mtoe (Mega tonnes of oil equivalent) and involved a generation of around 878 million tonnes of CO₂ equivalent.

Objectives

The LIFE Fresh Box project aimed to improve the sustainability of the of the full value chain of fresh product distribution (from farm to consumer) in order to enable the sector to offer higher-quality products to the end consumer, thus improve its competitiveness. The plan was to develop and demonstrate an innovative, and more environmentally friendly, container called the Fresh Box. This container would improve the sustainability reducing food waste due to extended shelf life, improving the quality of fresh products offered to the final consumer and saving CO₂ emissions due to lighter and more sustainable materials that lead to the reduction of energy consumption. The LIFE Fresh Box would be an active and smart container that stores and transports each type of fresh product in the ideal conditions for the required respiration rate. Its innovative micro/macro perforated membrane system would include active substances and ethylene absorbers that protect fresh products from microbial spoilage, thereby extending shelf life and avoiding food waste.

The boxes would be monitored with an innovative Integrated Sensor Kit (using RFID technology) to check the main environmental features in the container and allow traceability. They would be lightweight, made with a technology which saves energy (MuCell SFC) and applying an innovative material, PLA, which is recyclable, biodegradable and compostable.

Furthermore, the aim was to ensure that Fresh Box could be used to transport fresh products that are harvested at a higher maturity stage. As a consequence, end consumers would be able to enjoy fruits and vegetables with better physical, chemical and organoleptical features.

Results

The LIFE Fresh Box project developed and tested a smart container, Fresh Box, which comprises 60% bio-based and biodegradable material (PLA) and 40% conventional recycled plastic (PE), for usability reasons. They weigh 17% less than ordinary containers, while 20% less energy is consumed in their production process. This represents a reduction of 2.31 kgCO₂/container. Fresh Box containers integrate a Sensor Kit for the online monitoring of the main parameters related to the shelf life of the fresh products being transported.

)Transportation tests at real conditions with strawberries, cherries, raspberries, grapes, spinach and mushrooms demonstrated that the shelf life of fresh produce can be increased by more than 30%, especially for fruits and vegetables with higher added value or that are more vulnerable to postharvest or in storage (especially for long distances). The reduction of food waste largely surpassed the expected 20%, achieving for certain products twice or even seven times less food waste compared to conventional containers. The reduction of CO₂ emissions due to lighter and more efficient transport has been estimated to amount 3.17 kg CO₂ per tonne of fruit transported.

The beneficiaries are continuing to improve the design of the boxes in order to take advantage of all the options identified for a more competitive product and for its further use in the transportation of other commodities vulnerable to cold chain disruption or that require delicate care, such as flowers, aromatic plants or even pharmaceutical or cosmetic products.

Further information on the project can be found in the project's layman report and After-LIFE Communication Plan (see "Read more" section).

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Environmental issues addressed:

Themes

Environmental management - Cleaner technologies
Environmental management - Eco-products design
Industry-Production - Agriculture - Forestry
Industry-Production - Food and Beverages
Services & Commerce - Transportation - Storage
Waste - Agricultural waste
Waste - Waste reduction - Raw material saving

Keywords

energy saving, waste reduction, packaging, food production, freight transport, alternative technology, agricultural waste

Target EU Legislation

- Waste
- COM(2014)398 - "Towards a circular economy: a zero waste programme for Europe" (02.07.2014)

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	FUNDACIÓN PARQUE CIENTÍFICO TECNOLÓGICO AULA DEI
Type of organisation	Research institution
Description	The Aula Dei Science and Technology Park (PCTAD) located near Zaragoza hosts specialists in the food, agriculture and environmental industries. Areas covered include the application of postharvest technologies, new product development research and shelf life studies, development of new analytical techniques in postharvest quality control and active packaging of fruits and vegetables. Also covered are the efficacy of sanitation methods for disinfection of fruits and vegetables and new product development research.
Partners	Institute of Technology Tralee, Ireland Transfer Latin Business Consultancy S.L., Spain LAFUENTE TOMEY S.L., Spain Kölla Valencia, S.L., Spain Fundación AITIP, Spain

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Administrative data:

Project reference	LIFE13 ENV/ES/001362
Duration	01-JUL-2014 to 30-JUN -2017
Total budget	1,851,396.00 €
EU contribution	921,696.00 €
Project location	Nordrhein-Westfalen(Deutschland) Aragón(España) Cataluña(España) East Midlands(United Kingdom) West Midlands(United Kingdom)

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Read more:

Project web site	Project's website
Project web site - 2	Project's Facebook page
Publication: After-LIFE Communication Plan	Title: After-LIFE Communication Plan Editor: LIFE Fresh Box No of pages: 3
Publication: Layman report	Title: Layman report Editor: LIFE Fresh Box No of pages: 26
Publication: Technical report	Title: Technical evaluation report Author: AITIP Technological Centre Year: 2017 Editor: LIFE Freshbox No of pages: 24
Publication: Technical report	Title: Conclusions and guidelines of the project Author: PCTAD Year: 2017 Editor: LIFE Fresh Box No of pages: 16
Publication: Technical report	Title: Socioeconomic report Author: PCTAD Year: 2017 Editor: LIFE Freshbox No of pages: 39

Video link

[Project's YouTube Channel \[ES\] -
https://www.youtube.com/channel/UCrT9eDBi3ub0z5F-eOVsZag/videos?view=0&sort=dd&shelf_id=0](https://www.youtube.com/channel/UCrT9eDBi3ub0z5F-eOVsZag/videos?view=0&sort=dd&shelf_id=0)

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