Reduced use of plastic in the packaging of fresh fruit (apple) and pre-prepared products

Summary

Plastic is the most widely used material in food packaging, as it is cheap and has many shapes and uses. However, this material does not degrade, and is therefore a serious hazard for the environment. In order to address this environmental pressure, the European Community has established guidelines for reducing disposable plastic, and consumers demand packaging that is more sustainable and environmentally friendly, particularly with natural products like fresh fruit. Almost 56% of the population buys pre-prepared products on the basis that they are easy to prepare and ready to eat. These products use packaging that plays an essential role in terms of food safety, preservation and convenience. Concern for the environment has led to increasing awareness among companies producing pre-prepared products, and a commitment to innovation and sustainability in their current packaging systems.

The solution to using plastic must therefore be broad-based, as it is not just a question of finding an alternative material, but rather of trying to reduce the amount of waste and increasing the use of recyclables. Any solution will also have to be incorporated into the production system and will therefore have to be compatible with the packaging machinery currently used, and above all, must not reduce the quality of the fruit and minimally processed products in any way, to make the product as similar as possible to products in a plastic container.

Objectives

- Evaluation and quantification of the use of plastic packaging and items in the preparation of fresh fruit (apples). The plastic containers used in marketing of high quality apples (Poma de Girona) will be quantified and classified, and the economic impact of each one established.

- Strategies for the management and reduction of the use of these plastics in fresh fruit (apple) will be studied, considered from two points of view: reduction and reuse.

- Propose alternatives to the use of plastic materials in the marketing of fresh high-quality apples and the packaging of pre-prepared fruit and vegetables. These alternative materials must be easily integrated into the preparation chain, logistically viable and economically feasible for the sector. They must also be a viable solution in terms of sustainability which can be validated with life cycle analysis (LCA).

- Confirm that the proposed alternative packaging is able to maintain the characteristics of fruit in terms of mechanical protection and maintenance of the cold chain in sales of fresh products and the quality and shelf life of pre-prepared products.

Description of the measures planned in the project

Action 1.1. Carry out a detailed study of the types of apple preparation used in the IGP Poma de Girona centres. The type of materials in the packaging for each preparation (tray, basket, cover, loose, ring packet, etc.) will be defined: primary, secondary and/or tertiary packaging. The type of plastics used will be evaluated.

Action 2.1. Gather all available information on **REDUCING** plastics in the food industry, and share strategies aimed at avoiding or eliminating plastic items currently in use and the impact this would have on the fresh fruit preparation, logistics and marketing chain with the companies in the group.

Action 2.2. Quantify the use of **REUSABLE** packaging in the Poma de Girona preparation chain, assess the economic impact of this alternative, and increase the use of other items that could be included in the reusables chain for fruit.
Action 3.1. Review all the alternatives to the various plastic items used in the preparation of fresh fruit.
Action 3.2. Review the alternatives to plastic materials in the packaging of pre-prepared fruit and vegetable products.

Action 4.1. Select the most environmentally sustainable solutions and perform studies on fruit, comparing: (i) Ease of handling of temperatures with plastic and the new materials (ii) Impact of the new packaging on the maintenance of the quality of the fruit: impact, microorganisms and organoleptic quality (iii) Logistical performance of the new material: strength, storage, etc.

Action 4.2. Evaluate the most environmentally sustainable solutions and carry out studies with two of cut lettuce products and two cut fruit products to assess the influence of the new containers on the maintenance of their quality and shelf life. Assess the logistical behaviour of the new materials in the process and packaging line of minimally processed products, and their possible implementation under real retail conditions.

Expected results and practical recommendations

The main innovative aspect of this project is the proposal to carry out an in-depth study of the amount and type of plastic used in the fruit industry, in order to have an indicator of the kilograms of plastic that are generated and classify these plastics by type: PP, PE and EPS. Highlight the use of reusable plastic that could be a sustainable alternative for use in packaging, since it involves integrating the packaging into the chain so that it can be used repeatedly and finally, the challenge of finding alternative packaging materials to plastics that are more sustainable in both the distribution of fresh products and in industries producing pre-prepared products. This point will address all those items: honeycombs, meshes, baskets, 'flow packs', bags, trays and films that are used for preparations by fruit and vegetable companies and companies producing pre-prepared products, which can be replaced by a more sustainable alternative. The advantages and disadvantages of each one will also be assessed, and the effects that a change of packaging would have on the industry studied, in terms of both product quality and of transport logistics, storage, cost, consumer acceptance and so on.

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Subject area(s) of application

☐	Agricultural production system
☐	Agricultural practice
☐	Agricultural equipment and machinery
☐	Livestock farming and animal welfare
☐	Vegetable production and horticulture
☐	Landscape / Territorial management
☐	Pest and disease control
☐	Fertilisation and nutrient management
☐	Soil management
☐	Genetic resources
☐	Forestry
☐	Water management
☐	Climate and Climate Change
☐	Energy management
☒	Waste and by-product management
☐	Biodiversity and environmental management
☐	Food quality/processing and nutrition
☐	Supply chain, marketing and consumption
☐	Competitiveness and agricultural and forestry diversification
☐	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)

Dissemination of the project (publications, conferences, multimedia...)

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2020	Total budget: €81,909.07
Completion date (month-year):	DARP funding: €33,474.54
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