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Encouraging Brand Owners to Switch-to-Bio-Based in highly innovative ecosystems

CASE STUDY: ALHÓNDIGA LA UNIÓN, S.A.

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### Abstract

This case study presents the transition journey of Alhóndiga La Unión, a company exporting fruit and vegetables based in Andalusia, Spain. For La Unión, pushing food safety and product quality goes hand in hand with operating sustainably. For La Unión, pushing food safety and product quality goes hand in hand with operating socially-responsible and environmentally-sustainably. As part of its RDI strategy, La Unión seeks to develop circular approaches, including the valorisation of its own horticultural waste. Using residues from fruits and vegetable as feedstock, the company has pioneered development of various bio-based materials and ingredients, including materials for bio-based packaging. Under a newly establish brand, WeCarePack, the company is promoting its industrial compostable bio-packaging material, which it believes will help change the agri-food sector. The experience of Alhóndiga La Unión can serve as an example for other agri-food companies and farmer cooperatives that want to go beyond traditional practices, offering a chance to create a ripple effect throughout other industries.



This project has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 887727.



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## Company background

La Unión started as a family business dedicated to the exportation of vegetables and has grown over the years, becoming a model of commercialisation of fruit and vegetables. La Unión is proud to be the first company worldwide in cucumber commercialization.

The success of La Unión model is due to its close relationship with their clients. Distribution chains, supermarkets and markets transmit the ethos of La Unión to the consumer, bringing their products into the homes of the final consumer. All this is without forgetting the marketing, advertising, and online communication, all of these allowing a more direct relationship with families and consumers.



Currently, La Unión leads the commercialization of fruit and vegetable products in Europe, with sales of more than 400,000 metric tonnes of produce. Above 70% of this produce is directed at European markets. Moreover, the company now has 25 operations centres, distributed between Almería and Granada (southern Spain), 1,000 employees on average and 3 laboratories which carry out more than 45,000 analyses annually. Some additional figures can be found next.



Figure 1. La Unión business main figures.

## La Unión, an export organisation by vocation

Its vocation as exporters has converted La Unión into the main provider of fruit and vegetables in Europe, being present all over the continent. As a mission, they are a leading company which works collaboratively with employees, suppliers, and customers in a responsible way in order to guarantee a high profitability to their related farmers. At the same time, the company offers a product which meets the highest quality and food security standards. Their main aim is to lead the global fruit and vegetable market, offering innovative products and solutions which will inspire and provide a real added value to customers.

## Food safety and product quality as cornerstone



One of the fundamental pillars in La Unión is food safety, which is backed by R&D investment in their three laboratories. The Chemical and Microbiological Analysis laboratory at La Unión was created in 2000, the Agronomic Analysis Laboratory in 2008 and the Agronomic Analysis Laboratory in 2009. Together they employ more than 40 food quality staff that help safeguard the health of consumers across the whole of Europe and the human rights of La Unión's suppliers (farmers) and employees.

The different accreditations and certifications that La Unión has can be divided into three sections: Accreditation for laboratory, certification for agricultural holdings and certification for manufacturing warehouses.



Figure 2. Accreditations and certifications obtained by La Unión.

## Environmental commitment as a pillar of their Corporate Social Responsibility (CSR) programme

La Unión is committed to a sustainable environment, where the impact they generate is minimal. One of the key pillars of the company's CSR programme revolves around respect for the environment and the fight for a clean and waste-free world. CSR actions implemented in recent years include: the installation of a 500-panel, 100-kW solar photovoltaic (PV) power system in 2015, supplying 10% of the company energy needs at their facilities at Polygon La Redonda; the collaboration with the Andalusian Centre for the Evaluation and Monitoring of Global Change (CAESCG), acting as official sponsors of the book "Sierra de Gádor, natural heritage and green infrastructure in Almeria"; and the adoption of Integrated Production as a sustainable production system that guarantees environmental protection, quality and job security for farmers and livestock breeders.

## Fresh products with high quality standards

La Unión fruits and vegetables are cultivated throughout the year with the highest standards of quality and food safety by expert farmers and qualified technicians.



Also, in order to reach other consumer segments, La Unión has developed Shybari, a premium brand of fruits and vegetables of high quality (e.g. sweet chocolate pepper, California pepper, lamuyo pepper, Palermo pepper diamond tomato, mini watermelon, medlar and custard apple among others). This brand motto is "Desires from the Mediterranean" and main aim is to go further and provide an excellence pursuing lifestyle. In this sense, Shybari follows the philosophy and actions of La Unión, focused on promoting sport practices linked to a healthy lifestyle through a healthy and balanced diet. One of the main actions carried out by La Unión to promote Shybari and a healthy lifestyle has been to sponsor the Mutua Madrid Open 2018 tennis tournament. There, Shybari's premium fruits and vegetables were exhibited and savoured among all attendees, since the company had exhibition areas and show cooking in the tournament's VIP restaurant.

## Moving forward in bio packaging development

Sustainability is of paramount importance for La Unión, and accordingly, it is one of the main areas covered by the company RDI department. La Unión management team is fully devoted to support and promote a La Unión RDI strategy, backed by its own RDI department. This way, attention is paid to trending technologies and processes, including the use of bio-based packaging. This market trend is supported by consumer choices and preferences, since there is an increasing demand for all products related to “bio”, “eco-friendly” and “recycled” concepts.

What steps has the company already undertaken in its innovation journey to switch to bio-based, and where does it currently stand? To help make the transition from a linear to a circular economy, La Unión decided to explore the valorisation of its own horticultural waste streams, to produce various bio-based materials and ingredients, including materials for bio-based packaging.

## BIOVEGE

Starting in 2015, first step was the implementation of BIOVEGE, a Spanish collaborative research project led by La Unión that aimed to develop new technologies and/or adapt existing ones in order to

use efficiently, both in economic and environmental terms, horticultural waste generated during handling, transportation, and sale. This approach was the basis for the development of:

- Bio additives for packaging production coming from plant residues (fruits such as melon and watermelon and vegetables such as cucumber, pepper, and zucchini).
- New films and biodegradable oriented mesh for the packaging of fruit and vegetable products created using biopolymers coming from fruits and vegetable residues.
- Natural preservatives for a wide spectrum of foods and on their incorporation in novel preservation solutions as an edible coating.
- Extraction of bioactive ingredients from fruit and vegetable residues for the improvement of human health and the use of emulsions to incorporate mixtures of bioactive. The production of such highly-priced biomaterials and food ingredients from food waste co-products allowed adding value to these by-products.

The main conversion steps and applications investigated within the BIOVEGE project are illustrated in Figure 3.

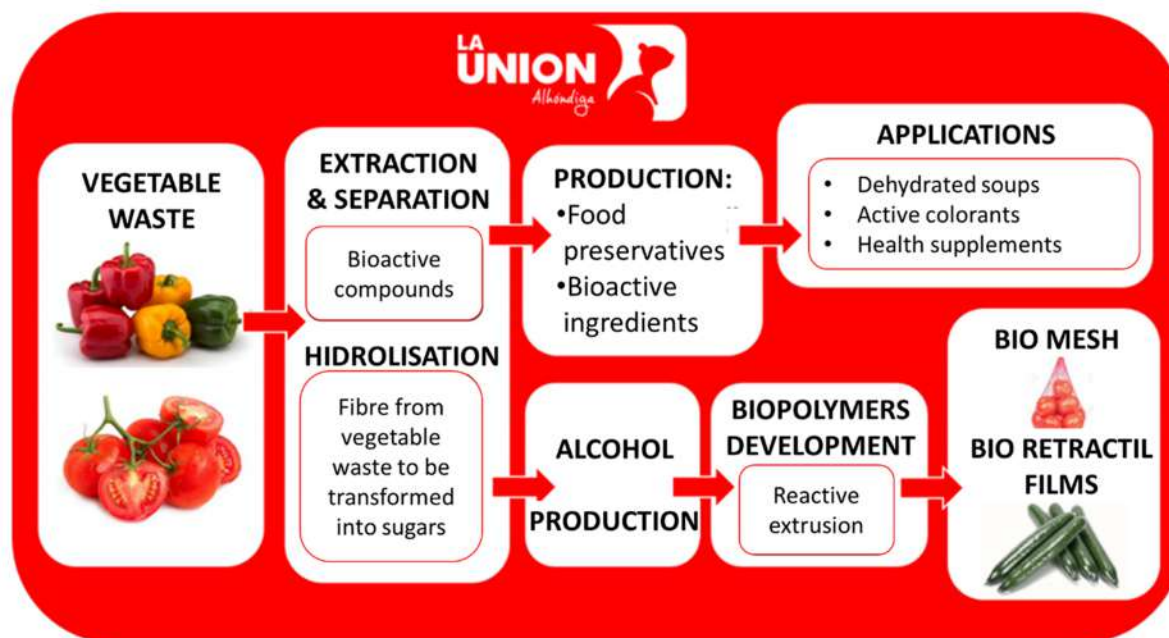


Figure 3. Conversion steps and applications investigated within the BIOVEGE project

The food-waste derived, certified industrial-compostable biopackaging solutions for mesh, second skin and flow-pack generated in the BIOVEGE project offer great sustainable alternatives for traditional plastic packaging, and have received international recognition. At the 2018 International Conference on Bio-Based Materials, the jury of the Bio-based Material 2018 competition awarded the third place to the innovative biodegradable net suitable for green beans packaging developed in the BIOVEGE. The packaging material is more than 80% bio-based, more sustainable than conventional polyethylene (PE) nets, but has similar linear weight and mechanical properties. The material is made combining different biodegradable materials and additives and using a compound that was developed through reactive extrusion. Chemical modification was made by grafting low molecular weight units, such as oleic alcohol, obtained by the fermentation of sugars extracted from vegetable waste (watermelon).

The BIOVEGE project's innovations culminated in the launch of a new 'plastic-free living' brand, called wecarepack. The wecarepack brand was launched at the 2019 IFEMA Fruit Attraction fair, where it received the Accelera award for Best Innovation and Entrepreneurship Project of the year 2019 in the industry category. Jesús M. Barranco, CEO of La Unión, was proud to explain that "the launch of our product comes after four years of research and hard work by the entire team that makes up La Unión". Mr. Barranco explained that "this product disappears in six months after depositing it in the organic matter bin." Fernando Batlles, Head of Communication at La Unión, added that "this product will mark a before and after in the agri-food industry and we intend that in the future all supermarkets will have a WeCare-Pack area".



Further developments of bio-based packaging solutions are being carried out through the VEGE-PACK project. The main objective of VEGE-PACK is to develop compostable packaging based on films and nets with antimicrobial, antifungal and/or antigerminative properties, by including in the biopolymer matrix the functional additives obtained from the fractions of interest from by-products of the pepper, custard apple and/or avocado with the intention of obtaining:

- A flexible film for the “flow pack” packaging of fruit and vegetable products.
- Nets for the packaging of fruit and vegetable products.

These packages, in addition to complying with Directive 94/62/EC on packaging and packaging waste and its modifications in Directive (EU) 2015/720 allow to maintain and/or extend the useful life of packaged products due to their functionalization with the products described.

### **Pursuing sustainability: circular economy as cornerstone and strong R&D investment following a holistic approach**

Beyond the BIOVEGE and VEGE-PACK biowaste valorisation projects, La Unión works in a number of other RDI projects related to circular economy, including knowledge-transfer initiatives e.g. to promote circularity among farmers by using better crops management strategies.

In the MORE-THAN-CLEAN project, the use of clean technologies and automated sanitization processes for fruits and vegetable production has been investigated. In the AGROHEALTH project, La Unión aims to develop natural biofertilizers that stimulate the synthesis of chemo preventive compounds in tomato and avocado fruits and the development of two food products from fruits rich in compounds with chemo preventive properties. Further R&D projects are devoted to remote control, simulation, and decision systems for agronomic management in pepper and cucumber crops greenhouses.



## Challenges shifting to bio-based

Main challenges faced in the journey to switch to bio-based products include

- Market entry for bioplastics is no sinecure as they compete with traditional plastics. Hence, a lot of attention has to be paid to business and marketing aspects in order to develop a customised marketing and commercialisation strategy able to overcome myths and barriers.
- It is important to duly consider the acceptance criteria of industrial composting plants. Not all plants are prepared to (or capable of) processing bio-based plastics.
- Although consumers demand sustainably-produced products, there is still a long road ahead due to poor consumer acceptance of bioplastics that are not 100% translucent.

## Lessons learned and take-home messages

Main lessons learned from this bio-based products transition journey are:

- Engage with good partners that are key players in the sector so a nice cooperation environment can be created and excellent knowledge transfer can take place.
- For full production at commercial scale of the bioplastics, it is important to work together with plastic producers, building a strong supply chain.
- The bio-based transition journey can act as trigger at internal level. It supports company staff in opening their minds to developing new products and working methods.



Although not formally mandated yet, both European Commission and Member States are stimulating economic actors to adopt circular economy practices. Hence, by gaining experience in the bio-based transition journey, companies can be more aligned with what would be expected from them in the upcoming years. In addition, this approach also helps companies being aligned with consumer demands with regard to about green, eco-friendly, bio, recycled products.