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Brochures presenting project goals Macarena Sanz (WP7 Coordinator)





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Contents

1	Summary	4
2	Scientific Audience Brochure: aim	5
3	General Public Brochure: aim	6
4	Annex 1_BROCHURES	7





1 Summary

In May 2015, as WP7 is the main reference for the Exploitation, Dissemination and Communication part of CHIC's project, at IDConsortium we created 2 brochures, in order to better explain the project itself and its objectives. The reason why we released 2 types of brochures is because we aimed at targeting 2 different audiences: on the one hand the generic public, and on the other hand a more scientific audience, that is familiar with the topics covered by this project.





2 Scientific Audience Brochure: aim

Talking about the scientific brochure, it was divided into 5 different sections. The very first one – **"The Project"** – is a brief overview of CHIC, a couple of lines to easily explain the core of this project.



In the **"Chic objectives and activities"** section, we explain the real actions and commitment of each partner of the Consortium, which consists of seventeen internationally leading industrial, academic and public partners. These partners are located in 10 European member states, one associated member state (Serbia) and in New Zealand. So, our goal is to clearly depict the main responsibilities of each one of the partners engaged in the project from all the strategic and operational points of view (scientific, socio-economic, culture and communication, stakeholder engagement, financial and managerial etc.) This way, we want to show in which way each of the 17 partners is contributing to CHIC's success.

After this section, within the **"Work Packages"** section, we highlight the 9 work packages involved in the project's development by describing in few words their main area of work.

With the **"Consumer and stakeholder dialogue"** section, we illustrate our commitment in terms of communication and engagement with stakeholders, in order to raise awareness on the topic and limit social concerns about NPBTs. Indeed, we focus on how we will make people feel more conscious about societal issues that affect us globally, and by doing so, we will activate our best communication channels, including arts, which always inspires broad audiences and stimulate debate.

At last, in the **"Chic's Outputs"** section, we aim at summarising the main objectives we are going to reach with the next strategic steps and by working efficiently on each task included in every work package, such as showing the real consumer benefits of the products from chicory, informed decision making for policy makers and businesses, and many more.





3 General Public Brochure: aim

By creating the second brochure for a broader public, our objective is to illustrate more into details the final purpose of the project without focusing too much on theoretical/scientific notions that might be too complex to understand if you are not dealing directly with scientific subjects. So, the real purpose of this brochure is to create a general interest for CHIC's area of research, by highlighting the reason why such a project can truly overcome and solve existing social issues from a consumer's perspective.

We have 5 sections, starting from **"What is CHIC"**, a slightly longer explanation of the core project than the one we have in the scientific brochure, because we want to give a clear and easier portrait of it with people that are unfamiliar with the topic.

We felt that, by using titles on the **"5Ws style"**, we would get a more impactful effect on people's mind, because it shows the attempt of solving a doubt/question that anybody might have.

"Why chicory? Inulin and terpenes" section, makes immediately clear the 2 main products that CHIC's project focuses on and why they are so important to such an extent they can improve our health and life.

The following 2 sections **"New Plant Breeding Techniques (NPBTs)"** and **"What is CRISPR?"** are focused on two important topics of CHIC's project. In fact, the traits CHIC wants to improve are almost impossible to achieve by conventional plant breeding only. Therefore, the ambition of CHIC is to develop and implement four different New Plant Breeding Techniques (NPBTs) to convert chicory into a new and robust multipurpose crop for a biobased economy, that will produce improved dietary inulin and bioactive terpenes with human benefits. Furthermore, CRISPR is a natural defence system that protects bacteria against attacking viruses. It can also be used as a plant breeding tool and in human medicine. These applications have been developed in the last decade. CRISPR already produced revolutionary advances in the treatment of genetic diseases and, in the future, it could improve agriculture forever. So, CRISPR technology is a simple yet powerful tool for optimizing plant properties in a pace which is in line with changing environment and consumer needs. That is why we dedicated two sections to the main 2 techniques of this project.

In the last section – **"Expected Impacts"** – we aim at showing the outcome and benefits that we would get from such a project, such as contributing to the EU goals of increased sustainability of agriculture and the bio-based economy by developing new types of useful crops, leading to an improved understanding of biotechnology and informed decision making and much more. This way, people can have an idea of what to expect from CHIC.





ANNEX 1: PROJECT BROCHURES





Scientific Audience Brochure



THE CONSORTIUM

The CHIC consortium consists of seventeen internationally leading industrial, academic and public partners. Partners are located in 10 European member states, one associated member state (Serbia) and in New Zealand

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CHICORY AS A MULTIPURPOSE CROP FOR DIETARY FIBRE AND MEDICINAL TERPENES





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THE PROJECT



CHIC is an innovation project aimed at implementing New Plant Breeding Techniques (NPBTs) in chicory, in order to establish it as a multipurpose crop for sustainable molecular farming of products with consumer benefits.

CHIC'S OBJECTIVES AND ACTIVITIES

The aims of CHIC project are:

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- To develop and improve NPBTs as *breeding tools* for chicory.
- To provide examples of NPBTs with **benefits for European consumers**, such as the development of chicory varieties which produce prebiotic and immunomodulatory dietary fibres and bioactive terpenes.
- To provide a *socio-economic* analysis of the impact of NPBTs on the chicory value chain (breeders, growers, processing industry, foodand cosmetics industry), by supplying new varieties that produce superior and/or novel products.
- To *develop* risk assessment *protocols* for NPBTs in chicory.
- To monitor *regulatory* and *policy* developments relevant for the implementation of NPBTs in plant breeding.
- To provide a Life Cycle Assessment (LCA) of the **environmental impacts** of the novel chicory varieties and products throughout the whole value chain.
- To identify and investigate societal concerns and needs by **involving stakeholders** and considering their views during the entire project period.
- To develop and use innovative, art-based cultural communication tools to stimulate the *interaction* with the public and increase awareness.
- To develop two business cases: one for improved inulin as dietary fibre and sugar replacer, and one for a novel chicory product with health benefits.

WORK PACKAGES

LEAD PARTICIPANTS

e\Gene

iKi

JOANNEUM

ΤU

Consortium

WAGENINGEN

WAGENINGEN

WP1. Development of four conceptually different NPBTs.

WP2. Implementation of NPBTs in Chicory for dietary inulin.

WP3. Implementation of NPBTs in Chicory for bioactive terpenes.

WP4. Technical and Risk assessment of NPBTs.

WP5. Socio-economic and environmental impacts on the whole value chain.

WP6. Stakeholder engagement.

WP7. Exploitation, dissemination and communication.

WP8. Commercial exploitation of chicory as a multipurpose crop.

WP9. Management.

STAKEHOLDERS ADVISORY GROUP PROJECT PARTNERS

Plant Product Farmers <u></u> Breeding developmen Plant molecular Molecular Biosafety Environmental and Molecular Industr Consumers groups farming Health organisations Biomedical Social sciences sciences Legislation Economics (Communication Arts



CONSUMER AND STAKEHOLDER DIALOGUE

In public debates, NPBTs frequently raise high expectations as well as strong concerns. CHIC will therefore, involve a broad range of stakeholders to raise awareness about these and discuss issues associated with the chicory varieties developed in the project and with NPBTs in general. These include techno-economic potential health benefits, possible environmental and socio-economic impacts, broader societal issues, safety concerns and risk mitigation as well as regulatory and policy measures. Moreover, CHIC will engage with artists who will make themselves familiar with the NPBTs and express their feelings and views in pieces of art, including art installations to inspire a broader public debate.



CHIC'S OUTPUTS

Products from chicory with consumer benefits.

- Business cases on inulin and terpenes demonstrating chicory's potential as a multipurpose molecular farming crop.
- Implemented NPBTs to allow an efficient breeding of the high potential chicory crop.
- Blueprint for responsible pathways and strategies for co-innovation in future plant breeding and plant biotechnology.
- Improved communication strategies towards stakeholders and the general public.
- Informed decision making for policy makers and businesses.





General Public Brochure



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The CHIC consortium consists of seventeen internationally leading industrial, academic and public partners. Partners are located in 10 European member states, one associated member state (Serbia) and in New Zealand.

STICHTING

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CHICORY AS A MULTIPURPOSE CROP FOR DIETARY FIBRE AND MEDICINAL TERPENES





WHAT IS CHIC?

CHIC is a 7.3 million euro project funded by the European Commission under the H2020 programme. Horizon 2020 allocates more than 80 billion euro to research and development to solve the great challenges faced by the European society.

CHIC aims at developing chicory varieties as a crop to increase the diversity and sustainability of agricultural production while serving consumer needs. These varieties shall produce improved dietary fibres and medicinal compounds. CHIC also aims to facilitate a transparent discussion and create awareness about New Plant Breeding Techniques such as CRISPR.



WHY CHICORY? INULIN AND TERPENES

Industrial chicory is being grown mainly for extraction of inulin, which is valuable as dietary fibre and sweetener. It is for example used in bread and dietary products because it benefits digestive health.

The chicory crop has a single big root (taproot), from which inulin is extracted. Inulins are food fibres of varying lengths that are mainly composed of fructose. Inulin acts as a prebiotic and promotes the growth of beneficial gut bacteria, and stimulate our immune system.

In the chicory root some other interesting compounds are present, such as terpenes. Terpenes are compounds naturally occurring in many plants. The terpenes found in chicory give chicory and Belgian endive their appreciated bitter taste. Earlier research provides evidence that the bitter tasting terpenes from chicory have beneficial properties for health because they have anti-microbial and anti-cancer activity.

NEW PLANT BREEDING TECHNIQUES (NPBTs)



Developing a new chicory variety via conventional plant breeding takes time, between one and two decades, usually providing only small incremental improvements. The traits CHIC wants to improve are almost impossible to achieve by conventional plant breeding only. Therefore the ambition of CHIC is to develop and implement four different New Plant Breeding Techniques (NPBTs) to convert chicory into a new and robust multipurpose crop for a bio-based economy, that will produce improved dietary inulin and bioactive terpenes with human benefits.

The consortium will evaluate the technical performance of four NPBTs, as well as the safety, environmental, regulatory, socio-economic and broader societal issues associated with these techniques. CHIC will strive to ensure responsible innovation and to raise public awareness, by involving stakeholders and considering their needs and concerns in all phases of the project.



WHAT IS CRISPR?

CRISPR is a natural defence system that protects bacteria against attacking viruses. It can also be used as a plant breeding tool and in human medicine. These applications have been developed in the last decade. CRISPR already produced revolutionary advances in the treatment of genetic diseases and, in the future, it could improve agriculture forever.

NPBTs like CRISPR can be used to generate plant varieties that are better adapted to our changing climate or that can contribute improving our environment, such as robust crops that require less agrochemicals or nutrients.

The aim of using NPBTs is to introduce only directed mutations, the ones that generate the intended improvement. With this, the method is more precise and since no, or much less back crossing is required to remove additional mutations, it is also much faster. CRISPR technology is a simple yet powerful tool for optimizing plant properties in a pace which is in line with changing environment and consumer needs.

By developing and implementing a set of NPBTs, CHIC will strengthen chicory as a production system for high-quality dietary fibres and establish it as a source of bioactive terpenes. The consortium will evaluate their efficacy, potential benefits and risks, evaluate socio-economic consequences and develop business plans for commercialization of the new chicory products.



EXPECTED IMPACTS

Contribution to the EU goals of increased sustainability of agriculture and the bio-based economy by developing new types of useful crops.

New data for the assessment of innovative NBPTs as tools for future plant breeding and their potential for a speedy uptake in general breeding practice.

Innovation in the way plant breeding technologies are introduced to the public for an improved understanding of biotechnology and informed decision making.