

RESEARCH ON THE DEVELOPMENT OF TECHNOLOGIES FOR THE REDUCTION OF SUGARS IN JUICES AND REVALORIZATION OF EXTRACTED SUGARS AS HEALTHY INGREDIENTS. ET2ECOSUGARS

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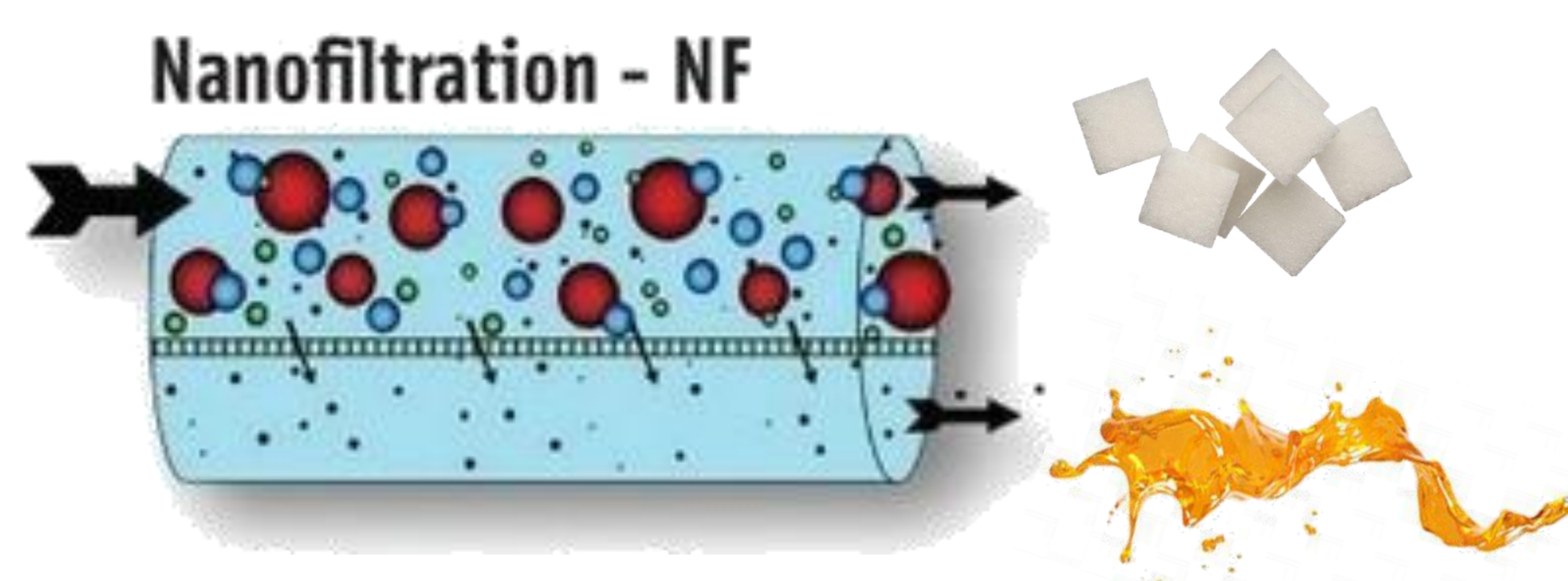
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INTRODUCTION

Excessive intake of free sugars has been identified by the World Health Organization (WHO) as a major public health concern, due to its association with metabolic disorders such as obesity and diabetes. Natural fruit juices, while perceived as healthy, often contain high levels of naturally occurring sugars, prompting the need for new technologies capable of reducing their sugar content without compromising their natural composition, sensory attributes, or nutritional quality. Current methods such as chromatography show promising results but face limitations in terms of practical application and industrial scalability. Alternative approaches including enzymatic treatments and fermentation have also been explored, but these often result in significant alterations to juice composition and the loss of valuable compounds and organoleptic characteristics. In response to these challenges, and in alignment with the recent EU Directive 2024/1438 aimed at reducing sugar content in fruit juices to meet consumer demands for healthier food options, the ET2ECOSUGARS project seeks to develop innovative, green technologies that enable partial or total sugar reduction in fruit juices. The project focuses not only on maintaining the quality and integrity of the juice but also on upcycling the extracted sugars into functional, healthier ingredients for use in other food products. Through a multiphase research strategy including the identification of suitable filtration processes, laboratory trials, industrial scale-up, and sensory and nutritional analyses ET2ECOSUGARS aims to provide sustainable, scalable solutions that support both regulatory compliance and the development of healthier, low-sugar alternatives within the food industry.



OBJECTIVES

- ☐ Investigate green and sustainable technologies for sugar reduction in fruit juices without compromising their flavor, texture, or nutritional quality.
- ☐ Revalorize natural fruit sugars extracted during the reduction process by converting them into healthy ingredients for nectars and beverages.
- ☐ Replace processed sugars (e.g., corn syrup, cane and beet sugars) with upcycled natural fruit sugars in the formulation of new food products.
- ☐ Align the development of low-sugar juice beverages with EU Directive 2024/1438 and WHO recommendations on free sugar intake.
- ☐ Provide scalable and integrative solutions that promote healthier diets and improve sustainability across the food and beverage sector.

EXPECTED RESULTS

- ✓ Development and validation of green, scalable technologies capable of reducing sugar content by at least 30% in juices, while preserving their natural flavor, texture, and nutritional value.
- ✓ Production of healthier fruit juice beverages aligned with WHO recommendations and compliant with EU Directive 2024/1438, meeting consumer demand for low-sugar alternatives.
- ✓ Generation of high-quality natural fruit sugar concentrates from extracted juice sugars, suitable for replacing processed sugars such as glucose syrup and cane/beet sugar in food and beverage formulations.
- ✓ Reformulation of commercial beverages using upcycled fruit sugars as a sustainable alternative to traditional sweeteners, reducing reliance on refined sugar sources.
- ✓ Implementation of a sustainable and integrative production process that minimizes product loss, enhances resource efficiency, and supports the circular economy in the food sector.



Picture 1. Filtration pilot plant

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