

# OPTIBERRY

OPTIMAL USE OF BY-PRODUCTS OF BERRY FRUIT PRODUCTION



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## BACKGROUND

In Europe, almost 2 million tons of berries are grown. More than 15% of these berries do not enter the fresh market for quality reasons. Part of these non-premium fruit are sold at dumping prices to the industry. Economically relevant functionalities and bio-activities have been assigned to berry biomass. Most of the berry species are rich in a broad set of functional molecules such as polyphenols. This provides multiple opportunities for bio-based product development.

## OBJECTIVE

OPTIBERRY targets innovative processing and biorefinery/extraction concepts to food prototypes and (non)-food ingredients for sustainable use of berry biomass available, especially the non-premium fruit. The project will result in high added value (non)-food applications to process or market the non-premium class fruit of raspberry, strawberry, and blackberry (Figure 1). This valorisation will result in a more resilient berry supply chain.

## METHODOLOGY

The project starts with an overview of the unique functional molecules in the berry species and the impact of processing and storage on their content. A systematic and detailed high-resolution mass spectrometry (HRMS) analysis of these target compounds will be performed to assess the content of well-defined functional molecules in the (non-premium) berries (3 different species, 3 varieties, 3 EU locations, 2 seasons), and the impact of storage. The results will be used to estimate the potential for further development. A market study will be set up to evaluate the potential of 3 selected product pilots based on berries, that is innovative packages of unprocessed berries, beverages/purees and gelled products. Co-creation sessions will be organised to identify 2 new cases for business modeling. The 3 pilot cases include the optimisation of the innovative processing steps and product recipes to maintain the functional molecules present in berries. The project will also focus on biorefining of the non-premium fruit to food and non-food ingredients (cosmetics), where extraction of the fruit will be performed for both food and non-food applications as a colourant, or antioxidant. As a result, the potential of the extracted products will be evaluated as a food and cosmetic ingredient.

## RESULTS

A comprehensive overview of the unique functional molecules in the above-mentioned berry species is fulfilled. The HRMS analysis of the target compounds is running to analyse the impact of year, region, species, variety and harvest time. The market study and co-creation session revealed new type of products. Juices were tested from the 3 different berry species and produced with two types of pressing technologies: the spiral filters press and the hydraulic filter press. The impact of processing was evaluated on functional molecules and physico-chemical properties. In the other cases, nectar and berry wine was tested on different parameters.