

Adding value to the waste products of olive oil extraction (BECOMOLI)

Summary

AGRÍCOLA DE L'ALBI produces olive oil. The extraction rate is 23%. The remaining mass is an exhausted paste called pomace, which is sold to other companies as biomass. Considering the significant volume of pomace generated, and that this is a common problem for the sector, this project aims to implement alternative processes within the oil mill that generate by-products with added value, such as glucose and polyphenols. The focus and the innovation is the application of cascading biorefining processes to recuperate higher value products from the complex biomass resulting from the production of olive oil. This will lead to improvement in the economic results of the mill and will increase the sustainability of the process.

Objectives

The objective is to maximise the value of pomace, a by-product obtained in oil mills, recovering the glucose and polyphenolic compounds contained therein through the application of eco-efficient cascading methods, in order to open new market niches and improve competitiveness. We aim to provide an alternative to the problem that exists in the sector of olive oil producers: the high volume of waste by-products that are generated, which are generally sold as biomass. Glucose and polyphenolic compounds will be marketed to biotechnology industries. The processes used have to allow for the final products to be considered natural, with a low carbon footprint. The technical objectives of the project are: 1) to determine the influence of farming practices, time of harvest and mill processing parameters on the chemical characteristics and yield rates of the final products obtained from the pomace; 2) to fractionate the pomace with eutectic solvents; 3) to obtain glucose and polyphenolic acids from the cellulose and lignins recovered from the pomace; and 4) to scale-up the processes at the oil mill.

Description of project activities

- 1: Obtain the pomace and determine the influence of farming practices, time of harvest and processing on the chemical characteristics of the final products. Polysaccharide, polyphenol, lignin, fat and xenobiotic content of the pomace obtained from the pressing of olives of different sources will be measured to determine the influence of each parameter in the process.
- 2: Fractionate the pomace with eutectic solvents. Less polar components will be separated from more polar ones. In a second phase, polysaccharide fractions will be separated from lignins.
- 3: Recovery of the products of higher economic value (glucose and polyphenolic acids) from the various fractions of pomace. From the solid fraction, cellulose-type polysaccharides will be transformed into monosaccharides, and the glucose will be extracted. From the liquid fraction, which is rich in lignin and polyphenols, polyphenolic acids will be obtained.
- 4: Scaling-up of the processes at the company's facilities. The processes with the best results in the laboratory setting will be scaled-up in a reactor
- 5: Dissemination of the results among the business organisations and final users.

Expected results and practical recommendations

From the first part of the study (determination of the effect of farming practices, time of harvest, and processing in the chemical composition) we expect to obtain the necessary information on the chemical characteristics of the by-products to monitor in a more precise manner the relationship between the applied processes and chemical composition.

From the second part (fractionation of the pomace with eutectic solvents), the expected results are: the acquisition of the separate fractions of the pomace and determination of the influence of the by-product and technological processes used on the type of materials recovered at the end.

From the third part (recovery of higher value products, glucose and polyphenolic acids from the different pomace fractions), the expected results are: the acquisition of glucose and polyphenolic compounds, and the determination of the influence of the initial composition of the by-product and the technological processes used in the fractionation on the final yield and purity of the obtained product and on the final oligomeric waste.

From the scale-up of the processes at the company's facilities, we expect to be able to adjust the conditions of the process at the pilot stage to demonstrate the new alternatives to increase the value of the pomace.

Finally, the expected results from the dissemination of the results of the project is the transference of the knowledge obtained to businesses in the olive oil producing sector, final consumers of the by-products, and the general public.

Operational Group Leader

Entitat: **AGRÍCOLA DE L'ALBI, SCCL**

E-mail de contacte:

cooperativa@agricolaalbi.es

Tipologia d'entitat:

Cooperativa

Operational Group Coordinator

Entitat: **AGRÍCOLA DE L'ALBI, SCCL**

E-mail de contacte:

cooperativa@agricolaalbi.es

Tipologia d'entitat:

Cooperativa

Other Operational Group members (beneficiaries of aid)

Other Operational Group members

Entitat: **CENTRE DE DESENVOLUPAMENTS BIOTECNOLÒGICS I AGROALIMENTARIS**

E-mail de contacte: **BA) DE LA UNIVERSITA** Tipologia d'entitat:)

canela@quimica.udl.cat

Centre de recerca

Entitat: **DOP**

E-mail de contacte:

olidoplesgarrigues@olidoplesgarrigues.com

Tipologia d'entitat:

Altres agents del sector

Entitat: **FCAC**

E-mail de contacte:

edalmau@fcac.coop

Tipologia d'entitat:

Associació o federació de cooperatives

Keyword-category

Agricultural production system
General

Territorial scope**Province**

Lleida

County

Garrigues

Project dissemination *(publications, seminars, multimedia...)*

Jornades tècniques, fires, cursos divulgació, publicacions, pàgines web.

Project website

<http://www.agricolaalbi.es/>

Other project information

Project period

Starting date (month-year): Maig 2017

End date (month-year):

Project status: *Ongoing*

Approved budget

Total budget: 233.128,20 €

Funding source DARP: 94.556,54 €

Funding source EU: 71.332,12 €

Own funds: 67.239,54 €

With the support of:

Project funded by Operation 16.01.01 (Cooperation for innovation) of the Rural Development Program of Catalunya 2014-2020.

Basic regulation: Ordre ARP/96/2016, de 27 d'abril, per la qual s'aproven les bases reguladores dels ajuts a la cooperació per a la innovació a través del foment de la creació de grups operatius de l'Associació Europea per a la Innovació en matèria de productivitat i sostenibilitat agrícoles i la realització de projectes pilot innovadors per part d'aquests grups, i es convoquen els corresponents a 2016.

Project id.: E+L 2016