NEW BIO-PRODUCTS AND INNOVATIVE VALUE CHAIN FROM OLIVE PROCESSING

Promote the bio-economy of the olive oil value chain

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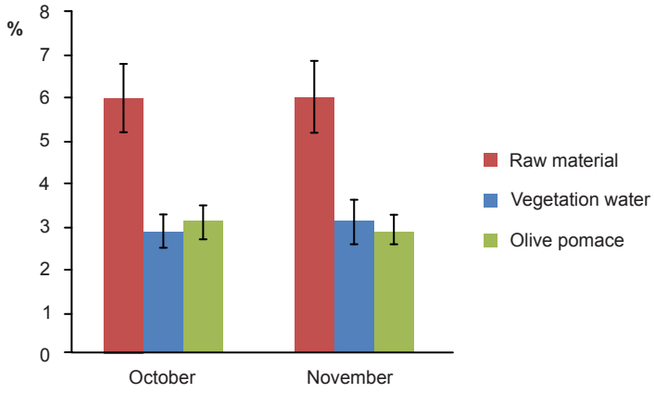
THE WHAT AND WHY

The bio-products of the olive oil value chain

Traditional olive orchards account for a large share of the area under olives in the EU, particularly in marginal areas. Traditional olive growing can survive only by improving olive farmer incomes and recognizing its multifunctional role. Italy is the second largest olive oil producer of the European Union, and Umbria can be considered as one of the most interesting regions because of the high quality production of extra virgin olive oil and a close connection with traditional knowledge and the local environment. The regional olive oil chain involves about 30,000 farms growing olive trees covering about 27,000 ha and including 270 oil mills. The olive oil production phase comprises the extraction of the oil and additional by-products (water, pomace and husk). By-product management is very important; the olive oil mill wastes have a great impact on soil and water environments because of high phyto-toxicity (phenol, lipid and organic acids). On the other hand, such wastes may be potentially valuable.

Production of olive pâté from the re-utilization of wet pomace. The possibility to produce innovative products reduces the management of waste at oil mills
Andrea Pisanelli



Percentage of raw material, vegetation water and olive pomace compared with the quantity of olive fruits harvested during the season. The yield of olive pâté is about 3% of the olives processed at the oil mill.
Giuseppe Russo

HOW IS THE CHALLENGE ADDRESSED

Olive pâté from olive processing at oil mills

Currently often the prices of extra virgin olive oil do not guarantee an adequate income for the operators. The situation is aggravated by the fact that the processing residues resulting from the oil production (pomace and vegetation water) represent a problem for the millers in terms of disposal. With an innovation it will be possible to obtain two products of the highest quality from olives.

The production of olive pâté has been empirically tested in October-November 2017. The experimental protocol has been set up adopting the following steps:

1. Check of the integrity and quality of the olives
2. Check of the integrity and quality of the raw olive pomace extracted during the processing
3. Transport of the raw material in suitable containers (stainless steel) to the processing laboratory
4. Processing with the addition of other ingredients and sterilization or pasteurization
5. Packaging of the final product (olive pâté)

The olive pâté production is estimated to be about 6% of the weight of the processed olives (about 50% constituted by water).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727872.

Keywords: Bio-economy, olives, residues, bio-products

HIGHLIGHTS

- Currently often the prices of extra virgin olive oil do not guarantee an adequate income for the operators.
- The processing residues resulting from the oil production represent a problem for the millers in terms of disposal.
- The olive pâté production is an example of a possible innovative value chain that could be implemented using bio-residues.

Bio-residues from the olive processing can be used also to produce bio-materials
Cecilia Cecchini

ADVANTAGES AND DISADVANTAGES

Olive can provide many valuable products, but…

Olive mill wastes can be considered as resources to be recovered. Olive pâté production is an example of a possible innovative value chain that could be implemented using bio-residues. However, its promotion depends on market demand and implementation of specific legislative roles.

In our experiment the olive pâté yield can be integrated with the extra-virgin olive oil production, guaranteeing an alternative source of income at the oil mills. However, the commercialization of such product, since it is destined for human consumption, requires the respect of appropriate regulations and the implementation of specific technical skills at the oil mills. The relevant legislation is the Legislative Decree 3 April 2006, n. 152 “Environmental regulations”, published in the Official Gazette no. 88 of April 14th 2006 - Ordinary Supplement n. 96, on waste management.

Additional uses of bio-residues from the olive process that can give a surplus of income are:

- Olive husk used to produce bioenergy;
- Olive pomace used to produce biogas;
- Residues also used to produce bio-materials.

Countries must have strong governmental policies regarding olive mill wastes, taking into account the economic role of this sector at small villages in remote areas and at large premises at the same time. This requires an integrated approach in the waste management operations of the olive sector, with provisions made for the farmers, industries, energy, water resources, and regulatory bodies.

FURTHER INFORMATION

Fernández Bolaños J, Rodriguez G, Rodriguez R, Guillén R, Jimenez A (2006) Potential use of olive by-products. Grasas y aceites 57(1):95-106.

Galanakis CM, Kotsiouu K, (2017) Recovering of bioactive compounds from olive mill waste. Ch. 10 In: Galanakis C, Olive mill waste, Recent Advances for Sustainable Management, Eds. Elsevier.

Graziani D (2014) Oltre l’olio extravergine d’oliva. Valorizzazione dei residui di frantoio in campo edile ed alimentare. Tesi di laurea magistrale in Ingegneria per la Sostenibilità Ambientale. Università degli Studi di Modena e Reggio Emilia.

Niaounakis M, Halvadakis P (2004) Olive-mill waste management: literature review and patent survey. Ed. Typothito-George Dardanos Publications, Athens, Greece.

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JULY 2018