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Development of a prototype malaxer to investigate the influence of oxygen on extra-virgin olive oil quality and yield

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A system that supplied gas and measured oxygen concentration was implemented on a prototype malaxer. The system was able to measure the oxygen concentration both in headspace and in the olive paste. Five processing conditions were performed to assess the influence of the oxygen on the qualitative/quantitative parameters of the obtained olive oil. Several parameters were determined and a session of sensorial analysis was performed. The oxygen content in the headspace and olive paste was measured and the balance between these contents was assessed; a high correlation between the oxygen consumed in the headspace and the oxygen consumed by the olive paste was found. An amount of oxygen per kilogram of dough, over 40 minutes of kneading, falling in the range 55.4 to 77.9 mg [O₂] kg⁻¹ [olive paste], give of the best qualitative and quantitative performance during the malaxation process. The experimental tests have also demonstrated that a controlled oxygen supply promotes the production of volatile compounds responsible of balanced oil, avoiding its excessive oxidation. These data allowed us to define new basic parameters for the malaxer design and to optimize the extraction performance, thus ensuring the production of high-quality olive oil.

Biography

Antonia Tamborrino is an Assistant Professor on Agricultural Mechanics and Food Processing Plants at the University of Bari, Department of Agricultural and Environmental Science. Her scientific research deals with the innovation and optimization of agro-food industry equipment and plants, design of the food pilot plants and their implementation in the industrial environment, sensors and real time process for the food industry, processes settings and influence of industrial processes on food quality. She has participated on different national and UE projects to develop innovative processes and prototypes of agro-industry plants.

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