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# Improvement of olive oil flavor and bioactive composition by optimizing industrial extraction using taste sensor devices

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Olive oil is appreciated by consumers due to sensory and health properties [1]. Indeed, it is well known that virgin olive oil (VOO) is a potential antioxidant [2] showing anti-inflammatory, cardioprotective, anticancer, antidiabetic and neuroprotective effects [2]. Specifically, an important expansion of the nutraceutical market has been observed with olive products due to the health benefits associated with their polyphenols [3].

The increasing levels of competition of the worldwide olive oil market and the need of satisfying the consumers incessant search for healthy foods, led to the appearance of differentiated high-value olive oils. The possibility of producing enriched olive oils with related health claims [4], either by optimizing production key variables or by using flavoring techniques is a challenge and an opportunity to segment the broad trade category of olive oils. The present work aims evaluate the feasibility of producing enriched “ready-to-sell” olive oils with enhanced flavor and high contents of bioactive natural compounds. Furthermore, profiting from the fast progress in material sciences, software innovations and electronic systems integration, novel electrochemical taste sensors (electronic tongue and nose) will be designed as *in-situ* cost effective alternative devices to standard analytical techniques. The expected outputs may contribute to the sustained economic growth of the olive oil national industry.

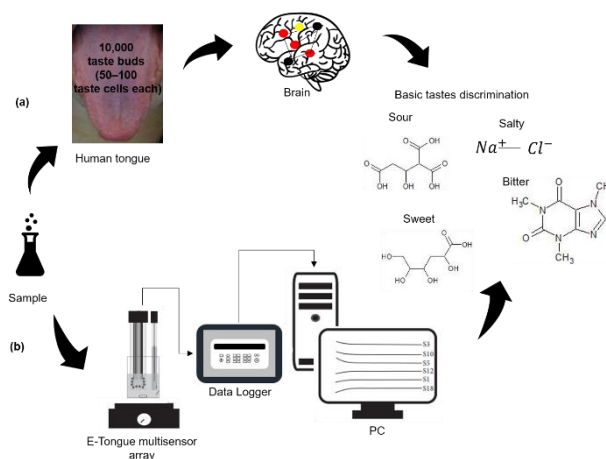


Figure 1. E-tongue working principle

## References

[1] Sacchi R, Della Medaglia D, Paduano A, et al (2017) Characterisation of lemon-flavoured olive oils. *LWT - Food Sci Technol* 79:326–332.

[2] Boss, A., Bishop, K.S., Marlow, G., Barnett, M.P.G., Ferguson, L.R. Evidence to Support the Anti-Cancer Effect of Olive Leaf Extract and Future Directions. *Nutrients* 2016, 8, 513.

[3] de Bock M, Derraik JGB, Brennan CM, Biggs JB, Morgan PE, et al. (2013) Olive (*Olea europaea* L.) Leaf Polyphenols Improve Insulin Sensitivity in Middle-Aged Overweight Men: A Randomized, Placebo-Controlled, Crossover Trial. *PLOS ONE* 8(3): e57622.

[4] European Commission Regulation (EU) No 432/2012 (2012). Establishing a List of Permitted Health Claims Made on Foods Other Than Those Referring to the Reduction of Disease Risk and to Children's Development and Health. *Official Journal of the European Union*, L136, 1–40.



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## IMPROVEMENT OF OLIVE OIL FLAVOR AND BIOACTIVE COMPOSITION BY OPTIMIZING INDUSTRIAL EXTRACTION USING TASTE SENSOR DEVICES



Olive oil is appreciated by consumers due to sensory and health properties. The increasing levels of competition of the worldwide olive oil market and the need of satisfying the consumers incessant search for healthy foods, led to the appearance of differentiated high-value olive oils. The possibility of producing enriched olive oils with related health claims, either by optimizing production key variables or by using flavoring techniques is a challenge and an opportunity to segment the broad trade category of olive oils. The present work aims evaluate the feasibility of producing enriched “ready-to-sell” olive oils with enhanced flavor and high contents of bioactive natural compounds. Furthermore, profiting from the fast progress in material sciences, software innovations and electronic systems integration, novel electrochemical taste sensors (electronic tongue and nose) will be designed as *in-situ* costeffective alternative devices to standard analytical techniques. The expected outputs may contribute to the sustained economic growth of the olive oil national industry.

### Present achievements

- Evaluation of malaxation effect on olive oil overall quality (physicochemical, sensory quality and phenolic profile)
- Application of a lab-made electronic tongue to monitor the malaxation influence on the olive oil’s quality and phenolic composition **aiming increasing their sensory, nutritional and health characteristics.**
- Applying flavoring techniques to obtain a “ready-to-sell” enriched olive oil (at flavor and polyphenolic levels).

### Future Developments

- Designing taste sensor devices for *in-situ* analysis, allowing at-time monitoring of olive oil key quality at industrial level.

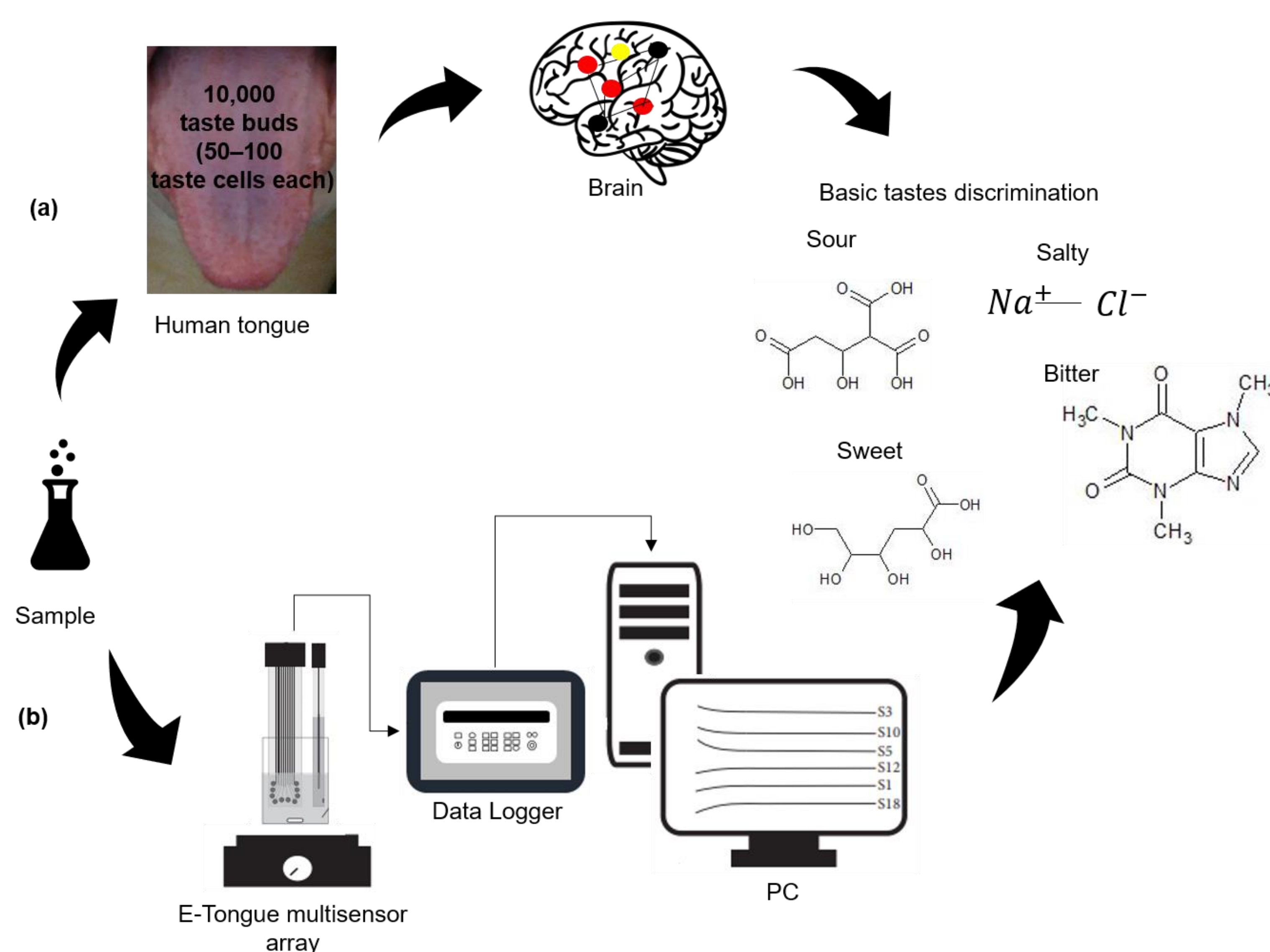


Figure 1. Electronic tongue work principle