

Impact of the zeodration process on the antioxidants and aromatic compounds of food products: comparison with two other dehydration processes.



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The zeodration drying process is an alternative to the most sophisticated existing drying processes for water based products. This process results in a very soft drying operation of the products under vacuum and at a temperature close to ambient and in extremely good economical and environmental conditions. This process is intended for the food sectors, cosmetics and pharmaceutical. The study that we carried out aims at comparing the influence of the zeodration drying process on the phytochimic composition of basic food substances compared to other traditional drying techniques including freeze-drying and hot air drying.



Materials & Methods

Preparation and drying of raw materials



Extraction step

Aromatic compounds

Pentane, 100 b, 40 C

Products : orange, carrot, rosemary, thyme, basil, mint and parsley



Phenolic compounds

Methanol, 100b, 40 C

Products : strawberries, parsley, tomato, orange, carrot, grape and blueberry

Assay step

GC-FID



HPLC

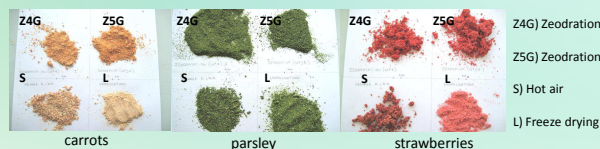


ORAC scale



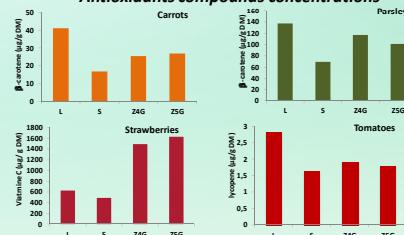
Results

Color analysis

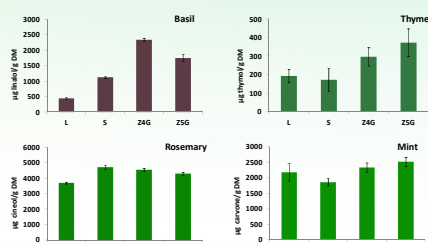


Zeodration is a technique that does not cause discoloration of the products

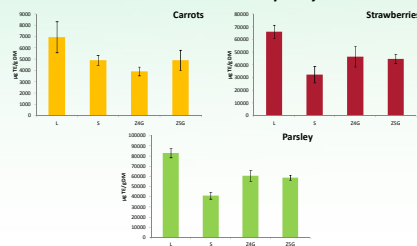
Antioxidants compounds concentrations



Aromatic compounds concentrations



Antioxidants capacity



Conclusion

The assays carried out by recognized or standardized methods revealed that zeodration drying generally allowed a good preservation of the antioxidants (from 4.9 mgTE/g DM (dry matter) for carrot to 60.6 mgTE/g DM for parsley). In the same way, our study made it possible to highlight a very good preservation of the aromatic compounds in the zeodrated products (up to 4.5 mg/g DM of cinéol in the extracts of rosemary). In conclusion, taking into account the results obtained and economic and ecological advantages of this technology, it is probable that the zeodration will be used itself more and more in food industries in the next years.

References

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- Rendu F., Donnet T., Gachet C. and Cazenave JP (2011), Zeodration method for the preservation of blood platelets, WIPO Patent Application WO/2011/124280.
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