Harnessing the Economic, Nutritive, and Commercial Potential of Pomace through UPE

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Introduction

136 million tons of food processing waste (FPW) is dumped into landfills. Food scraps makes up 14% of the total FPW produced each year.¹

Don’t Waste the Waste

Global Impact

- Food Wasted
  - 55 million metric tons of food waste per year in the USA³

- Green House Emissions
  - 113 million metric tons of CO2 is emitted into gas emissions³

Food Waste per year in the USA³

1.3 billion metric tons is wasted or lost from food processing waste²

Key Takeaways

- Ultra-high pressure extraction (UPE) is an extraction method that can be used to extract BAC’s from nutritious food waste (pomace).
- The mode of action is Le’challers Principle
- During extraction, high pressure is used to deform the cell walls of the pomace, the damage to the cell walls allows for an enhanced rapid dissolution of BACs into the solvent.
- UPE can operate at low temperatures (suitable for thermolabile compounds) and uses GRAS solvents which is cost effective.

Biologically Active Compounds

- Flavonols (Quercetin)
  - Antioxidant
  - Natural preservative, Anticancer agents

- Carotenoids (Carotenes)
  - Radical scavenger
  - Anticancer, anti-aging formulations

- Flavonones (Hesperidins)
  - Antioxidant
  - Cardio-protective agents, pain reliever in arthritis

- Dietary fiber (Pectins)
  - Swellable polymer in food

Possible Products

- Products could be produced from the pomace extract with natural antioxidants, anti-inflammatories, and would have no artificial contents added.
- Replace hazardous synthetic ingredients that are added to beverages and food products.
- The products developed could be used as natural flavorings for beverages and food.

Summary

In summary the extraction of BACs using UPE provides short extraction time, effective extraction of thermolabile compounds and can be executed in large quantities.

The amount of organic waste thrown out every year can be utilized through UPE methods to produce natural and antioxidant filled products. The results from this study will demonstrate why UPE should be used commercially for the natural extraction of BACs.

References and Acknowledgements

4. Image taken from Jun Xi, Ultrahigh pressure extraction as a tool to improve antioxidant activities of green tea extracts, 2011.

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