

cibia2019@ualg.pt  
[www.cibia-2019.org](http://www.cibia-2019.org)  
INSTITUTE OF ENGINEERING



# XII CIBIA 2019

## BOOK OF ABSTRACTS

XII IBEROAMERICAN  
CONGRESS OF FOOD ENGINEERING

# CHALLENGING FOOD ENGINEERING AS A DRIVER TOWARDS SUSTAINABLE FOOD PROCESSING

UNIVERSITY OF ALGARVE, GAMBELAS CAMPUS  
FARO / ALGARVE / PORTUGAL  
**1 > 4 JULY 2019**

# XII IBEROAMERICAN CONGRESS OF FOOD ENGINEERING



XII  
CIBIA  
2019

UNIVERSITY OF ALGARVE, GAMBELAS CAMPUS  
FARO / ALGARVE / PORTUGAL  
1 > 4 JULY 2019

## *“Challenging Food Engineering as a Driver Towards Sustainable Food Processing”*

**e-Book of Abstracts**

### **Editores**

Margarida Vieira

Rui Cruz

Célia Quintas

Gil Fraqueza



## Preservation processes applied to kiwi peel as strategies to add value to fruit wastes

FEDERICA M. STRIGLIO<sup>a</sup>, FÁTIMA A. MILLER<sup>a</sup>, JOANA F. FUNDO<sup>a</sup>, CRISTINA L.M. SILVA<sup>a</sup> AND TERESA R.S. BRANDÃO<sup>a\*</sup>

<sup>a</sup> Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, 172, 4200-374 Porto, Portugal

\*Corresponding author

[tbrandao@porto.ucp.pt](mailto:tbrandao@porto.ucp.pt)

Wastes from food industries are considered potential new sources of natural occurring polyphenolic compounds with health promoting biological activities. Particularly, the residues of fruits (peel and seeds) may have higher nutritional content, bioactive compounds and antioxidant activity than the pulp or juice. In this context, the interest in the effective utilization of these wastes is growing.

The objective was to assess the impact of freezing and freeze drying applied as preservation processes of kiwi peel, evaluating some bioactive compounds and antioxidant activity.

Kiwis (*Actinidia deliciosa*) surfaces were rubbed gently with a gauze to remove excess fuzz and make them smooth. Peel was removed by hand with a stainless steel knife and cut into small slices.

Approximately 200 g of peel were submitted to a freeze drying process (-45 °C, 20 Pa, 96h). Dried samples were packed in polyethylene flasks (100 mL) and stored at room temperature. The same amount of peel was frozen in a forced air freezer at -80 °C. Frozen samples were also packed into polyethylene flasks and stored at -18 °C. The processes were replicated twice.

Total phenolics, chlorophylls and antioxidant activity were analyzed before and after processes and after 21 days of storage.

Fresh cut kiwi peel had 54.5±42.9 µg/g (in dry basis; d.b.) of total phenolics, 105.3±39.6 µg/g (d.b.) of total chlorophylls and 1158.1±227.9 µg/g (d.b.) of antioxidant activity.

The freezing process did not affect significantly these compounds. At the end of frozen storage, phenolics content increased 5 times, while total chlorophylls and antioxidant activity of frozen peel were retained.

The impact of freeze drying was significant in all compounds analyzed. When compared to fresh samples, freeze dried peel presented a total phenolics content 10 times higher. However, at the end of storage, the content was comparable to the one detected in fresh cut peel. In terms of total chlorophylls, the content in freeze dried samples was 5 times higher. At the end of storage, this content was retained (548.1±33.7 µg/g d.b.). A decrease of 42% of the antioxidant activity was observed in freeze dried samples, also observed at the end of the storage.

Frozen kiwi peel retained quality parameters, even after 21 days of storage. Dried peel had higher total chlorophylls content but lower antioxidant activity at the end of storage. When microbiological assessed, kiwi peel preserved by freezing or freeze drying can be used as a food ingredient with potential health benefits.

**Keywords:** Freezing, Freeze drying, Phenolics, Chlorophylls, Antioxidant activity