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Dietary fibre concentrates produced from papaya by-products for agroindustrial waste valorisation

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Summary In this work, papaya agroindustrial wastes were treated with ethanol and subsequently dehydrated to produce pulp or peel dietary fibre concentrates (DFCs). Hot air convection (CV) and microwave (MW) assisted dehydration were studied. The DFCs produced were mainly composed by cell wall polymers such as cellulose, lignin, proteins and non-cellulosic carbohydrates. It was found that convective drying produced DFCs with lower uronic acid content than microwave drying. Besides, pulp DFCs dehydrated by MW presented higher values for hydration properties, compared to those reported in literature. Peel DFCs presented better antioxidant properties than those from the pulp. Use of peel tissue, as well as CV produced DFCs with higher values of glass transition temperature. The characteristics found in the DFCs allow concluding that these products may be added in a diverse range of food products, granting benefits that would normally be obtained using several additives.

Keywords Antioxidant characteristics, drying, functional properties, papaya industrial wastes.

Introduction

Papaya (*Carica papaya* L.) is a fruit tree widely grown in tropical and subtropical regions. Their fruits are rich in phytochemicals (Gayosso-García Sancho *et al*., 2011) and are mainly used for the obtention of jellies and juices. It is also the source of papain, the proteolytic enzyme with many industrial uses (Castro-Vargas *et al*., 2016). By-products generated during the harvest and industrialisation of the papaya might be stabilised, reprocessed and the products obtained can be used in the food industry.

Isolation of cell wall polymers from vegetables is one way of recovering nutrients as dietary fibre and other compounds from these vegetable wastes. Adequate fibre intake of 14 g total fibre per 1000 kcal, or 25 g for adult women and 38 g for adult men has been recommended, taking into account the research demonstrating their protection against coronary heart disease (Dahl & Stewart, 2015). Besides, these polymers can act as rheological modifiers in food (Fissore *et al*., 2007) and also provide antioxidant activity (Perez-Jimenez & Saura-Calixto, 2018).

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Isolation of dietary fibre concentrates (DFCs) from papaya byproducts by means of microwave dehydration was reported in Nieto-Calvache *et al*. (2016a), searching the conditions for optimum functional properties. Nevertheless, when microwave equipment is not available, dehydration through convection can be applied and, to the best of our knowledge, there are not enough data in bibliography for papaya DFCs obtained by a convective process. Accordingly, the objective of the present research was to produce DFCs from papaya agroindustrial wastes, by means of an ethanol treatment followed by dehydration with hot air convection. And also to compare the effect of the drying method (convective and microwaves) on the composition, functional and thermal properties of the DFCs.

Materials and methods

Dietary fibre concentrates production

Fresh papaya tissue (pulp or peel) was treated with ethanol 96 mL/100 mL for 15 minutes, at a temperature of 20 °C, using an ethanol/sample ratio of 2.9 mL g^{-1} (Nieto-Calvache *et al*., 2016a). Subsequently, hot air convection drying (CV) using a forced

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convection equipment (FAC, Argentina, model SRBCO 4040) was performed with an air velocity of 2.0 m s^{-1} at a temperature of 40 °C. Drying way continued until the moisture reached constant values and a_w was lower than 0.6 to ensure the microbiological stability of the DFCs. In addition, a batch of DFCs dehydrated with microwave assistance was produced for comparison purposes following the procedure described by Nieto-Calvache *et al.* (2016a). In all cases, processing times were evaluated. Finally, four DFCs were produced: two dehydrated by hot air convection (pulp and peel DFCs-CV) and two by microwaves (pulp and peel DFCs-MW). The DFCs obtained were milled and sieved through a mesh ASTM 40 to obtain particles of sizes below 420 μm.

Functional characterisation

Different properties related to the functionality of the DFCs were evaluated.

Hydration and oil absorption capacities

For hydration and oil absorption capacities, a quantity of each dietary fibre concentrate (DFC) was mixed with water or oil and kept for 18 hours at 25 °C (de Escalada Pla *et al.*, 2010). The water-holding capacity (WHC) and swelling capacity (SC), were determined in graduated glass tubes with 0.0500 g of each DFC. The amount of water sorbed and the volume of the swollen fibre were measured. For the determination of the water retention capacity (WRC) and oil holding capacity (OHC), amounts of 0.04 and 0.2 g of each DFC respectively were weighed in Eppendorf safe-lock tubes. WRC as well as OHC were determined gravimetrically after centrifugation. Finally, the water soluble fraction was measured in the supernatant of the centrifugation (Nieto-Calvache *et al.*, 2016a).

Antioxidant characterisation

The antioxidant capacity was evaluated by two different methods (DPPH and FRAP). DPPH measures the antiradical capacity based on the method proposed by Brand-Williams *et al.* (1995). Briefly, ≈0.2 g of each DFC was mixed with 5 mL of solution of DPPH 6×10^{-5} M prepared in ethanol (96 mL/100 mL) and variation in absorbance (λ = 515 nm) after 60 minutes was measured. A calibration curve was constructed with 0–70 μL of 8.8×10^{-4} M Trolox solution. Results were expressed as μmol Trolox equivalent/100 g of sample. FRAP measures the reducing capacity and was used according to Basanta *et al.* (2014). In this case, an amount of ≈4.5 mg of each DFC was swelled in 2.0 mL of water. After reagent addition, the reaction was monitored by measuring the increase in absorbance at a wavelength (λ) of 595 nm after 120 minutes. A calibration curve was constructed with 0–1500 μL aliquots of 2 μmol mL^{-1} $FeSO_4.7H_2O$ aqueous solution. Results were expressed as μmol Trolox equivalent/g of sample through the comparison with Trolox response.

Antioxidant compounds such as polyphenols, ascorbic acid and carotenoids were spectrophotometrically determined at wavelengths of 765, 500 and 450 nm respectively. For the determination of phenolic compounds and ascorbic acid, calibration curves were performed using galic acid and ascorbic acid standards (Anedra, Buenos Aires, Argentina). Carotenoids were quantified on an acetone extract using the molar absorption coefficient method. All the procedures carried out were detailed in Nieto-Calvache *et al.* (2016b).

Chemical characterisation

Cell wall compounds

The alcohol insoluble residue (AIR) was first obtained, in order to concentrate the cell wall polymers of the DFCs and to reduce interferences in the subsequent determinations. The procedure was carried out by sequential washing of the DFCs with ethanol as explained in detail by Latorre *et al.* (2013).

To quantify cell wall compounds, three different hydrolysis with sulfuric acid were performed on the AIR which allowed evaluating, gravimetrically, the content of lignin and cellulose. Neutralised supernatants were used to evaluate, spectrophotometrically, the contents of proteins (Lowry *et al.*, 1951), of non-cellulosic carbohydrates (Dubois *et al.*, 1956), and of uronic acids, one of the non-cellulosic carbohydrates (Filisetti-Cozzi & Carpita, 1991). Methyl groups were determined according to Fissore *et al.* (2007). Degree of methylation was calculated as the percent ratio between moles of methanol and moles of uronic acid in the sample (Latorre *et al.*, 2013).

The results of each determination were expressed on the basis of the weight of each DFC. Besides, in some cases, data were converted to fresh peel or fresh pulp weight basis (FW) using the yield value reported in Table 1, to allow the comparison with bibliographic information.

Moisture content and water activity

Moisture was determined on ≈ 0.500 g DFC using infrared heating (Ohaus MB45 moisture analyzer Corporation) till constant weight. The a_w was determined using an AQUA LAB Series 3 Quick hygrometer (Decagon Devices, Inc. Pullman, USA).

Glass transition temperature

The glass transition temperature, T_g, was determined by differential scanning calorimetry, using a Mettler Toledo 822 equipment and STARe Thermal Analysis

Table 1 Yield, chemical characteristics and drying time of dietary fibre concentrates from papaya

	Pulp DFC-MW	Pulp DFC-CV	Peel DFC-MW	Peel DFC-CV
Yield (g DFC/100 g Fresh part)	2.56 ± 0.07^{a,†}	2.53 ± 0.09^{a}	8.8 ± 0.8^{b,†}	8.9 ± 0.5^{b}
Yield of AIR. (g AIR/100 g DFC)	76.1 ± 0.6^{a,†}	78.0 ± 0.3^{b}	83.1 ± 0.7^{c,†}	84 ± 1^{c}
Moisture (g 100 g^{-1})‡	8.7 ± 0.1^{a,†}	6.6 ± 0.3^{b}	7.1 ± 0.4^{b,†}	6.8 ± 0.3^{b}
Aw	0.47 ± 0.02^{a,†}	0.40 ± 0.01$^{b.c}$	0.41 ± 0.02^{b,†}	0.36 ± 0.02^{c}
Cellulose (g 100 g^{-1})‡	31.9 ± 0.7^{a}	31.1 ± 0.3^{a}	27.8 ± 0.4^{b}	30.9 ± 0.3^{a}
Lignin (g 100 g^{-1})‡	0.93 ± 0.07^{a}	0.97 ± 0.03^{a}	4.2 ± 0.8^{b}	2.9 ± 0.9^{b}
Non-cellulosic carbohydrates (g 100 g^{-1})‡	16.6 ± 0.4^{a}	17.2 ± 0.7^{a}	14 ± 1^{b}	13 ± 1^{b}
Protein (g 100 g^{-1})‡	4.1 ± 0.5^{a}	3.9 ± 0.2^{a}	7.4 ± 0.1^{b}	7.2 ± 0.5^{b}
Uronic acids (g 100 g^{-1})‡	16.1 ± 0.9^{a,†}	10 ± 1^{b}	11 ± 2^{b,†}	7.5 ± 0.8^{c}
Methylation degree	82 ± 4^{a}	89 ± 4^{a}	83 ± 4^{a}	80 ± 3^{a}
Drying time (min)	178 ± 17^{a}	440 ± 25^{b}	90 ± 5^{c}	410 ± 23^{b}

DFC-MW, dietary fibre concentrates dehydrated by microwaves; DFC:-CV, dietary fiber concentrates dehydrated by hot air convection.
Different Lowercase letters in a row mean significant differences ($P < 0.05$).
†Retrieved from Nieto-Calvache *et al.* (2016a).
‡Result are expressed per 100 g of each DFC.

System version 3.1 software (Mettler Toledo AG, Switzerland). The measurements were performed with 14–17 mg of each DFC, using hermetically sealed aluminum pans of 0.04 mL inner volume (Mettler) which were heated from −80 to 80 °C at 10 °C min^{-1} rate.

Statistical analysis

One-way ANOVA with Tukey's *post hoc* test was conducted to compare the properties of the different DFCs. A correlation analysis was carried out to study the relationship between antioxidant capacity and phenolic compounds, carotenoids and ascorbic acid contents in DFCs. The software Statgraphics Centurion XV (02/15/06 Version, 2007 Statpoint Inc, Herndon, VA, Canada) was used for all analysis. All determinations were made at least in duplicate.

Results and discussion

Chemical composition of the DFCs

In general, the four DFCs, presented similar cellulose content (Table 1). Besides, peel DFCs had higher content of lignin and protein ($P < 0.05$) than pulp DFCs. In studies carried out by Lund & Smoot (1982), values of cellulose and lignin in fresh papaya pulp of 0.72 g/100 g FW and 0.086 g/100 g FW respectively, were reported. In the present research, the transformation of cellulose results to fresh tissue basis resulted in values of 0.82 and 2.4 g/100 g FW, in pulp DFC-MW and peel DFC-MW respectively. Likewise, results for lignin were 0.024 and 0.37 g/100 g FW for pulp DFC-MW and peel DFC-MW respectively, which are similar to the values above mentioned.

The protein content found in pulp and peel DFCs (Table 1) is comparable to that reported for fractions of dietary fibre produced by processing of peach bagasse (6.6 g/100 g) in studies reported by Nieto-Calvache *et al.* (2015). Non-cellulosic carbohydrates content in pulp DFCs, was slightly higher ($P < 0.05$) than in peel DFCs, and the values are in the order of those reported for dietary fibre concentrates produced from peach (de Escalada Pla *et al.*, 2012). On the whole, the drying method did not have a significant effect on the contents of cellulose, lignin, non-cellulosic carbohydrates or protein of DFCs.

Nevertheless, the variation in the drying method resulted in DFCs with different uronic acid content. The DFCs dehydrated by microwave presented a higher content of uronic acids ($P < 0.05$) than DFCs obtained by means of hot air drying from the same tissue. In the present research, the drying of DFCs through hot air convection, required a significantly longer drying time ($P < 0.05$) than microwave drying (Table 1), which might explain the results observed. In studies of dehydration of orange by-products at temperatures of 30 °C, reported by Garau *et al.* (2007), a decrease in pectic polymers was determined for longer times of heating. Likewise, Femenia *et al.* (2009) reported for hot air convection, a significant and negative effect of drying temperature on uronic acids content in kiwifruits, giving origin to a high level of solubilisation/degradation of pectins and hemicelluloses. Physiologically, pectins have been associated with different benefits, e.g., enhancing satiety, regulating and improving the intestinal microflora, reducing the re-absorption of bile acids and the intestinal absorption of carbohydrates, and preventing diabetes and other cardiovascular diseases (Galisteo *et al.*, 2008). Finally, all pectins had a high degree of methylation, fact that assures their gelling in the presence of high soluble solids content and low pH.

Functional properties of DFCs

Hydration and oil absorption capacities

In this work, the values of the hydration properties of DFCs from pulp were much higher than those reported in the literature; for example, pulp DFCs showed higher values (Table 2) for SC and WHC than fractions enriched in dietary fibre obtained from pumpkin pulp (41.8 mL g^{-1} and 43 g g^{-1} respectively) and from pumpkin peel (22 ml g^{-1} and 27 g g^{-1} respectively) by de Escalada Pla *et al.* (2007) and also, much higher values than products obtained from quince wastes (11.6 mL g^{-1} and 15 g g^{-1} respectively) by de Escalada Pla *et al.* (2010).

Water retention capacity represents the water strongly retained by the material. Thereby, food ingredients with high WRC values can be used in foods with an aqueous base, such as juices, nectars, yogurts and others, to stabilise these products during the production, distribution and storage processes. The WRC values of all papaya DFCs were higher than those determined for wheat bran fibre (2.9–5.8 mL g^{-1}) by Jacobs *et al.* (2016).

For pulp DFCs, microwave drying improved hydration properties, while for peel DFCs, the values showed non-significant differences. A possible explanation for the higher values of the hydration properties of pulp DFC-MW, may be associated with its higher uronic acid content (Table 1; $P < 0.05$) and, consequently to its higher hydrophilicity. In addition, longer drying times associated to convective heating could cause shrinkage phenomena in the tissue, affecting the porosity of the final product and its functional properties (Ghanem *et al.*, 2012).

Oil holding capacity is an important property because it helps to prevent phase separation during food preservation, storage and distribution. On the other hand, during human metabolism, it is also important because the entrapment of lipids in the intestinal lumen, might help to reduce serum cholesterol levels (Meng-Mei & Tai-Hua, 2016). OHC depends mainly on the physic characteristics of the material such as porosity, which is affected during processing. In this study, the higher OHC was determined for DFCs from the peel. On the other hand, for DFCs from the same tissue, the values for this property were significantly higher ($P < 0.05$) when microwaves were applied. The OHC values obtained for these concentrates are in the same order than those reported by Sette *et al.* (2016) for fractions enriched in dietary fibre and obtained from peach using microwaves (1.2–2.0 g g^{-1}) or hot air convection (1.3–2.1 g g^{-1}) for dehydration.

Antioxidant characteristics

The antioxidant capacity evaluated by the FRAP and DPPH methods was found to be significantly higher in peel DFCs than in pulp DFCs ($P < 0.05$) for both drying techniques (Table 2). Likewise, DFCs coming from peel, showed higher polyphenols, carotenes and ascorbic acid contents than DFCs from pulp ($P < 0.05$), which could explain the observed trend for antioxidant capacity. de Moraes Barros *et al.* (2012) carried out studies on citrus fruits grown in Brazil (lima orange, orange pear, lime Tahiti, sweet lime, tangerine Ponkan) and reported that the peels had higher antioxidant capacity (FRAP and DPPH) and higher content of phenolic compounds than the pulp. Likewise, Contreras-Calderón *et al.* (2011) found that many tropical fruits from Colombia, showed a higher antioxidant capacity (FRAP) and a higher phenolics content in the peel than in the pulp.

Table 2 Functional properties of dietary fibre concentrates from papaya.

Functional property	Pulp DFC-MW	Pulp DFC-CV	Peel DFC-MW	Peel DFC-CV
Swelling capacity (mL g^{-1})§	$84.0 \pm 0.9^{a,\dagger}$	57 ± 1^{b}	$20.3 \pm 0.2^{c,\dagger}$	18 ± 1^{c}
Water retention capacity (g g^{-1})§	$30.4 \pm 0.4^{a,\dagger}$	21 ± 2^{b}	$21 \pm 2^{b,\dagger}$	25 ± 1^{b}
Water holding capacity (g g^{-1})§	$90.7 \pm 0.9^{a,\dagger}$	64.2 ± 0.7^{b}	$27 \pm 1^{c,\dagger}$	24.3 ± 0.2^{d}
Oil holding capacity (g g^{-1})§	$1.20 \pm 0.01^{a,\dagger}$	1.116 ± 0.002^{b}	$1.37 \pm 0.03^{c,\dagger}$	1.278 ± 0.006^{d}
Water soluble fraction (g 100 g^{-1})¶	$24 \pm 2^{a,\dagger}$	23.5 ± 0.8^{a}	$15 \pm 1^{b,\dagger}$	14 ± 1^{b}
DPPH(μmol trolox 100 g^{-1})¶	$12 \pm 1^{a,\ddagger}$	23 ± 2^{b}	$54.86 \pm 0.08^{c,\ddagger}$	60.05 ± 0.09^{d}
FRAP(μmol trolox g^{-1})§	$10.2 \pm 0.6^{a,\ddagger}$	14.3 ± 0.5^{b}	$25 \pm 1^{c,\ddagger}$	29 ± 1^{d}
Phenolic compounds content (g 100 g^{-1})¶	$0.47 \pm 0.03^{a,\ddagger}$	0.58 ± 0.04^{a}	$0.99 \pm 0.03^{b,\ddagger}$	1.2 ± 0.1^{c}
Ascorbic Acid (mg 100 g^{-1})¶	$4.7 \pm 0.6^{a,\ddagger}$	4.6 ± 0.6^{a}	$14 \pm 1^{b,\ddagger}$	10 ± 2^{c}
Total carotenoids (mg 100 g^{-1})¶	$5.10 \pm 0.03^{a,\ddagger}$	6.6 ± 0.7^{b}	$8.1 \pm 0.8^{c,\ddagger}$	9.4 ± 0.3^{d}

DFC-MW, dietary fiber concentrates dehydrated by microwaves; DFC-CV, dietary fiber concentrates dehydrated by hot air convection.
Different Lowercase letters in a row mean significant differences ($P < 0.05$).
†Retrieved from Nieto-Calvache *et al.* (2016a).
‡Retrieved from Nieto-Calvache *et al.* (2016b).
§Results are expressed per gram of each DFC.
¶Results are expressed per 100 g of each DFC.

It can be observed that, for a same tissue, the DFCs dehydrated by hot air convection had a significantly higher antioxidant capacity (DPPH and FRAP) than those dehydrated by microwaves (Table 2). For DFCs from peel, these results could be explained by the contents of polyphenols and carotenoids, which were significantly higher ($P < 0.05$) for the DFCs-CV. For DFCs from pulp, the carotenoids content was higher in DFC-CV than in DFC-MW. Therefore, the antioxidant activity in the DFCs, might be mainly attributed to carotenoids and phenolic compounds, which were affected differently according to the drying method applied, and showed different concentrations according to tissue type. Carotenoids are recognised as strong antioxidant compounds due to their abilities to trap singlet oxygen and eliminate the peroxyl radical (Jing *et al*., 2015). de Ancos *et al*. (1999) reported that the microwave heating of papaya puree at 475 W produced a loss of 57% of the total carotenoids content. As previously stated, the drying by hot air convection produced a lower content of uronic acids (Table 1); therefore, some phenolic compounds associated with dietary fibre polysaccharides might have become more available, increasing antioxidant capacity.

The Pearson correlation analysis showed: (i) linear and positive correlation between phenolics and carotenoids content and antioxidant activity of the fractions, (ii) positive correlation between phenolics and carotenoids (CC = 0.9780, $P = 0.0220$), phenolics and DPPH (CC = 0.9852, $P = 0.0148$), phenolics and FRAP (CC = 0.9962, $P = 0.0038$), carotenoids and DPPH (0.9682, $P = 0.0318$), carotenoids and FRAP (CC = 0.9831, $P = 0.0169$), DPPH and FRAP (CC = 0.9954, $P = 0.0046$).

Glass transition temperature (T_g)

The onset, the midpoint and the final glass transition temperature, for the studied DFCs, are reported in Table 3. The onset and the midpoint temperatures are the most commonly reported values of T_g (Hancock & Zografi, 1994) and in this research, the temperature of the midpoint was used for comparison purposes. It was observed that T_g of peel DFCs was greater than pulp DFCs, for both methods of drying. Differences in T_g values between DFCs from the same tissue were probably related to: (i) The moisture content (Table 1), which was greater in pulp DFC-MW than pulp DFC-CV. It is known that a higher moisture content tends to decrease the T_g values (Slade & Levine, 1995). (ii) A higher yield of alcohol insoluble residue in the peel DFCs (Table 1), which means a higher concentration of cell wall polymers. Probably some of them contributed to the increase in the T_g values. (iii) The pulp DFC-MW presented higher water soluble fraction value (Table 2) than the peel DFC-MW. The water soluble fraction may contain a significant amount of simple sugars, which are responsible for the low values of glass transition temperature usually observed in fruits according to Slade & Levine (1995) and Vega-Gálvez *et al*. (2012).

Table 3 Glass transition temperature of dietary fibre concentrates from papaya.

	DFCs-MW[†]		DFCs-CV	
	Pulp	**Peel**	**Pulp**	**Peel**
Onset temperature (°C)	5.5 ± 0.9^{a}	28 ± 4^{b}	-3.7 ± 0.6^{c}	31 ± 4^{b}
T_g (°C)	7.6 ± 0.5^{a}	38 ± 2^{b}	18 ± 1^{c}	47 ± 3^{d}
Final temperature (°C)	9 ± 1^{a}	44 ± 6^{b}	48 ± 6^{b}	59 ± 8^{b}

DFC-MW, dietary fibre concentrates dehydrated by microwaves; DFC-CV, dietary fibre concentrates dehydrated by hot air convection.
Different Lowercase letters in a row mean significant differences ($P < 0.05$).
[†]Retrieved from Nieto-Calvache *et al*. (2016a).

Among DFCs from the same tissue, microwave dehydration produced DFCs with lower T_g values (Table 3). These differences can be associated to the moisture content, and chemical composition, e.g. in DFCs from peel, the differences in T_g values may be associated with differences in polysaccharide content. Molecules such as cellulose have T_g values of 226.85 °C (Hancock & Zografi, 1994). However, for other compounds such as pectin, T_g values have been reported to be between 16.8 and −26.6 °C for ranges of a_w between 0.12 and 0.91 (Basu *et al*., 2013). Thereby, for DFCs from the same tissue, the greater uronic acids and lower cellulose content in DFCs dehydrated by microwaves could be responsible for the reduction in the T_g value. Dehydrated foods with vitreous characteristics may be considered potentially stable during storage due to a decrease in the kinetic of deteriorating reactions mediated by the low rate due to the high viscosity of the system (Carter & Schmidt, 2012). Consequently, a lower T_g forces storage at a lower temperature to avoid deterioration.

Conclusions

An ethanolic treatment and two dehydration methods (microwave and hot air convection) were used to produce dietary fibre concentrates of pulp and peel from papaya agroindustrial wastes. Processing times were shorter when microwave drying was applied. Chemical analysis showed that all DFCs were composed by lignin, cellulose, uronic acids and proteins. Analysis of results showed that microwave drying preserved better the uronic acids than hot air convection drying.

All DFCs developed in this work showed antioxidant capacity. The evaluation through DPPH and

FRAP methods revealed that the DFCs-CV presented significantly higher antioxidant capacity than the DFCs-MW, which could be explained by the phenolic and carotenoids content in each product. On the other hand, pulp DFCs had much better hydration properties than the peel DFCs, and pulp DFC-MW presented better hydration properties than pulp DFC-CV. Finally, peel DFCs presented higher T_g values than the pulp DFCs, and hot air drying increased these values.

The concentrates produced in this work from papaya, contribute to by-products valorisation. According to their properties, they have great potential to be added to food products. For example, addition to baked products or ice creams can help to maintain the vitreous state during storage helping to prevent structure alterations or crystallisation of lactose in ice cream. In oil/water food emulsions, they can provide antioxidant activity diminishing rancidity occurrence. The choice of one or the other DFCs for its use will depend on the desired functionality.

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Conflict of interest

The authors have no conflict of interest to declare.

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