

December 8th, 2015

Prof. Charles Brennan
Prof. WitoonPrinyawiwatkul
Editors

Dear Prof. Prinyawiwatkul & Prof. Brennan,

Thank you for the constructive comments for the manuscript entitled 'Stability of fructooligosaccharides, sugars and color of yacon (*Smallanthus sonchifolius*) roots during blanching and drying' (manuscript # IJFST-2015-18965) submitted for review consideration in the International Journal of Food Science & Technology.

We have addressed all of the reviewers' comments and feel that the manuscript has been drastically improved. We are looking forward for a final decision.

Sincerely,

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Answer to Reviewers

Associate Editor: 1

Comments to Author:

The work is interesting, but some technical issues were raised by Reviewers. Please thoroughly respond to comments and have the manuscript revised accordingly.

Answer: Thank you for the constructive comments. We have addressed all of the reviewers' points. Please find all answers below.

Referee(s)' Comments to Author:

Referee: 1

Comments to the Author

The work is interesting, but the manuscript must be rewritten. Please, consider the following comments:

Answer: The manuscript has been revised and the suggestions and changes have been incorporated in the final version.

1. Page 2. Line 6. Put (OFS) after fructooligosaccharides.

Answer: This suggestion has been incorporated in the final version of the manuscript, but instead of OFS, FOS has been included.

2. Page 7. Line 58. BI does not represent the purity of brown color. It represents the browning suffered during treatment. Idem, page 13, lines 24-26. Please, revise it.

Answer: We have incorporated the reviewer's comment and made the corrections in the final version of the manuscript.

3. Page 13. Lines 8-10. ΔE does not represent the distance. Is the total color difference when a sample is treated compared with untreated sample. Please revise it.

Answer: We have incorporated the reviewer's comment and made the corrections in the final version of the manuscript.

Referee: 2

Comments to the Author

The manuscript entitled "Stability of fructooligosaccharides, sugars and color of yacon (*Smallanthus sonchifolius*) roots during blanching and drying" was well written and shows interesting results, which might have great practical importance. Generally, the manuscript is well written. However, due to some shortcomings this manuscript requires revision. Comments that should be considered to make the manuscript suitable for publication:

Answer: We agree with the reviewer. We have incorporated all the suggestions and comments provided by the reviewer and feel that the manuscript has been drastically improved. Thank you for the constructive comments.

P5 L21. "Water content was carried out" should be replaced by "Determination of water content was carried out" or "Water content was determined".

Answer: This suggested change has been incorporated in the final version of the manuscript.

P6 L4. Consider replacing “Mcilvaine” by “McIlvaine”.

Answer: This mistake has been corrected in the final version of the manuscript.

P6 29. “Two grams of yacon flour or 10 g of yacon roots were cut into small pieces”. It seems that cutting into small pieces concerns only roots. Consider writing: “Two grams of yacon flour or 10 g of yacon roots cut into small pieces”.

Answer: The reviewer is correct. We have incorporated his/her suggestion in the final version of the manuscript.

P7 L49. It is necessary to use appropriate designations for distinguishing colour systems (Hunter L, a, b Versus CIE 1976 L*a*b*).

Answer: The reviewer is correct. This has been clarified in the text of the final version of this manuscript including the following information:

The color in different samples was determined with a Konica Minolta Chroma metre (CR-400; Konica Minolta, Tokyo, Japan), using CIE1976 L*a*b* color space (CIELAB). The instrument was standardized with a white ceramic plate ($L^*=97$; $a^*=0.14$, $b^*=1.64$). The total color change (ΔE), Hue (h^*), Chroma (C), and browning index (BI) which represents the browning suffered during treatment (Palou *et al.*, 1999), were calculated according to the following equations:

$$\Delta E = ((L_o^* - L^*)^2 + (a_o^* - a^*)^2 + (b_o^* - b^*)^2)^{1/2}$$

$$h^* = \tan^{-1} (b^*/a^*)$$

$$C = \sqrt{(a^{*2} + b^{*2})}$$

$$BI = [100 (x - 0.31)]/0.172, \text{ where } x = (a^* + 1.75L^*)/(5.645L^* + a^* - 3.012b^*).$$

P8 L17. Provide the ratio of sample to Ca₂Cl solution. This ratio effects the rate of cooling. How about the solids gain while the cooling process?

Answer: The ratio sample: solution was 1:4 (w/v) and this information has been included in the final version of this manuscript.

P9 L8-17. The procedure was described before (P8 L48-57). Try to organize methodical information avoiding repetitions.

Answer: The reviewer is correct. To avoid repetition of information, P9 L8-17 has been deleted from the final version of this manuscript.

P14 L31. In fact the drying temperature within this study did not exceed 80°C. Perhaps the Authors could provide some references in order to confirm their assertion or this is mistake and should be written “as high as 80°C” instead of “higher than 80°C”.

Answer: The reviewer is right. We have replaced in the final version of this manuscript ‘higher than 80°C’ by ‘as high as 80°C’.

P23 L51. Consider replacing “on the flour” by “in the flour”.

Answer: It has been replaced in the final version of this manuscript as suggested by the reviewer.

Referee: 3

Comments to the Author

This is a straightforward manuscript with no serious flaws. However, the manuscript was not carefully prepared with a number of typographical errors. English writing in general should indeed be revised.

Answer: Thank you for the constructive comments. They have been incorporated in the final version of this manuscript. English has been revised.

Materials and methods section also needs to be enhanced with more detailed description of some experimental procedures adopted in the study.

Answer: More details have been provided in the text of the final version of this manuscript.

Some specific comments are as follows:

Page 4: I do not believe caramelisation can be caused by blanching.

Answer:The term caramelization has been deleted from page 4 as suggested by the reviewer.

At many places, chloride is incorrectly spelled as chlorine.

Answer: We have revised the manuscript and corrected this misspelling.

Page 5: Please specify the oven drying temperature (as per the AOAC method 925.45-A). Give the homogenization speed. Give also the model number of the homogenizer.

Answer: The oven temperature corresponded to 70 °C and the model and conditions of the homogenizer were: Ultra-turrax T25 (IKA works, Inc., Wilmington, NC) at 10000 rpm for 2.5 min. This information has been incorporated in the final version of the manuscript.

Page 6: ‘Mcilvaine’ should be ‘McIlvaine’ and ‘ml’ should better be ‘mL’. The specification of the homogenizer on this page is different from that on Page 5. Was the same homogenizer used?

Answer: The name has been corrected in the final version of the manuscript. The homogenizer and conditions corresponded to an Ultra-turrax T25 (IKA works, Inc., Wilmington, NC) at 10000 rpm for 2.5 min. This information has been incorporated in the final version of the manuscript.

Page 7: All color parameters should be written as italics. In addition, Hunter is noted as the color coordinates on this page but CIELAB is listed on the other page. Which coordinates were actually used?

Answer:The CIE 1976 L*a*b* color space was used and all color parameters are written in italics as requested by the reviewer. Changes are included in the final version of this manuscript.

I feel it would be more appropriate to list all the analytical procedures after the blanching and drying procedures.

Answer: We agree with the reviewer. All analytical procedures have been placed after the blanching and drying procedures as suggested by the reviewer.

Page 8: CaCl₂ is incorrectly spelled as Ca2Cl.

Answer: This correction has been made in the final version of this manuscript.

Why the concentrations and/or combinations of the solutions listed here were chosen? Please explain even briefly.

Answer: Acid concentrations that resulted in pH values of 3.1-3.4 of the blanching solutions were considered. Higher acid concentrations (to obtain a lower pH) can result in significant FOS losses due to hydrolysis. The evaluated salt concentrations were considered based on the work of Severini et al (2003).

Why not comparing water/solution blanching with steam blanching as well? It is known that steam blanching leads to less loss of soluble solids and hence is expected to give better results than water/solution blanching.

Answer: Initially water blanching and steam blanching were compared, however, even though PPO and POD were inactivated in more than 95%, after cooling of the samples, a progressive browning from the external part (skin) towards the center was observed. Thus, besides the inhibition of PPO and POD, it was necessary to use chelating agents of Fe and Cu (that catalyze the oxidation of polyphenols) such as acids and/or salts (explanation is provided in the final version of this manuscript). In addition, it was found that the addition of CaCl₂ helped to reduce sugar and FOS losses.

Why the particle size of the flour of 250 micron was selected? What was the moisture content of the flour?

Answer: Samples were ground and sieved to particle size of $\leq 250 \mu\text{m}$ as to guarantee an efficient extraction of sugars and FOS.

Page 10: It is stated that 'PPO was more stable to the boiling water...' The trend was not applicable for POD. Why? The cited references reported results at 75 and 80 C, which were not the temperatures used in this study anyway (especially in the case of water blanching, where sugars can easily be lost to the blanching water).

Answer: The statement has been corrected in the final version of this manuscript. Neves & da Silva (2007) has been cited because they report the stability of PPO partially purified up to temperatures of 75 – 80° C. These reported results demonstrate that PPO is a quite stable enzyme to temperature.