Reviewer 1:

General comment:

The text is written and edited carelessly. No capital letters in chapter titles, poor paragraph alignment, varied font. The document does not include line numbering, making it very difficult to pinpoint what specifically needs to be improved.

Response:

Thank you for highlighting these aspects. We have improved the quality of the text. All chapter titles begin with a capital letter (lines 234, 264, 404, and 480); the font was uniformized and line numbering was also considered.

Line 234

2.4 Physical Quality

2.4.1 Color

Line 264

2.4.4 Microstructure

Line 404

3.2 Physical quality of pineapple

3.2.1 Color

Line 480

3.2.3 Rehydration and microstructure

Comment 2

Abstract:

The abstract is written in two different fonts and is far too long. It contains unnecessarily too many results such as values of determination coefficients. Please shorten the abstract, standardize the font.

Response:

Thank you for stressing this important point. We shortened the abstract and standardized the font following your recommendations (lines 21-44).

Pineapple is one of the most consumed fruits worldwide due to its remarkable sensorial and health-promoting attributes. Nevertheless, pineapple's high moisture content (81-86%) impedes its long-term preservation, resulting in product losses and economic, social, and environmental challenges. Drying is the oldest processing technique for most fruits and vegetables. However, the investigation of modern technologies, such as infrared drying of pineapple, is limited. Besides, industries are investigating different methods to dry faster, thereby saving energy and reducing environmental impact.

Hence, this study used four drying methods to dry pineapple slices to allow the estimation of the most promising technique: infrared drying (ID), freeze-drying (FD), convective drying (CD), and relative humidity convective drying (RHCD). The impact of these dehydration techniques on drying kinetics, physical attributes (color, texture, rehydration, microstructure), aroma, and enzymatic activity (polyphenol oxidase, peroxidase) were reported. The results showed that ID had the highest coefficient of effective moisture diffusivity and drying rates and the shortest drying period (33.45%, 36.18%, and 76.12% lower than CD, RHCD, and FD, respectively). Drying curves were successfully fitted with the parabolic and logarithmic models, which showed higher coefficients of determination and lower reduced chi-square and root mean square error than the Newton and inverse logarithmic models. FD and ID triggered minor browning indexes, leading to the brightest products. RHCD and ID slices had the highest textural values and flavor concentrations, while FD samples showed the lowest. However, FD samples had a higher rehydration ratio than other dried products and showed slight structural modifications. Regarding polyphenol oxidase and peroxidase inactivation, ID was superior, followed by CD, RHCD, and FD. Actual results suggest that infrared drying could be an efficient technique for the obtention of high-quality dehydrated pineapple fruits in a short time.

Comment 3

Introduction

In the section on the drying techniques used, the authors should also refer to reports involving fruits other than pineapple.

Response:

Thanks for your comment. In addition to reports on pineapple, we have also cited 2 studies on *Gingko biloba L.* seeds and garlic (lines 106-110).

Boateng et al. [8] studied the influence of hot-air drying, freeze-drying, infrared drying, and pulsed-vacuum drying on the quality, bioactive elements, antioxidant activity, and toxic compounds of *Gingko biloba L.* seeds. In addition to these drying techniques, Feng et al. [9] also investigated the role of relative humidity convective drying on the quality, antioxidant activity, bioactive compounds, rehydration, and flavor of garlic slices.

Comment 4

Material and results

"2.2 Drying procedures" should be on a new line.

Response:

Thank you for drawing our attention to this aspect. Your suggestion is followed in line 137

2.2 Drying procedures

Comment 5

The numbering of mathematical formulas is non-uniform. Equation 3 has no reference.

Response:

Thanks for your comment. The numbering of mathematical formulas was uniformized () and the reference to equation 3 is supplied (line 197).

The subsequent equation (eq. 3) was used to compute the drying rate during the dehydration of pineapples [7]:

$$DR = \frac{M_{t1} - M_{t2}}{t_2 - t_1} \quad (3)$$

This equation denotes the variation of the moisture content (g/g) expressed as $(M_{t1}-M_{t2})$ in between respective drying times t_1 and t_2 (h).

Comment 6

"2.4.1. color" – section title should be capitalized.

Response:

We value your suggestion. The correction is available in line 234.

2.4 Physical Quality

2.4.1 Color

Comment 7

Under equation number 15 there is another formula which is not in the right place because it is on the text.

Response:

Thank you for suggesting this improvement. We moved the equation 16 to line 242.

Where:

$$X = \frac{(a^* + 1.75L^*)}{(6.645L^* + a^* - 3.012b^*)} \quad (16)$$

The colorimeter was initially calibrated on a white plate (Y = 85.6, x = 0.3162, y = 0.3238), and all measurements were replicated 6 times.

Comment 8

"2.4.4. microstructure" - section title should be capitalized.

Response:

Thank you for drawing our attention to this aspect. Your suggestion is followed in line 264

2.4.4 Microstructure

Comment 9

Tables 3 and 5 needs to be revised as it is unreadable in its current state.

Response: Thank you for this improvement. These tables are now tables 4 (line 455) and 5 (line 571) and were revised for better readability.

Table 4: The texture of fresh and dried pineapple slices

Texture parameters	Fresh	CD	RHCD	ID	FD
Hardness (g)	236.25 ± 44.45^{c}	1849.42 ± 323.13^{b}	2488.27 ± 255.17^{a}	2145.79 ± 208.01^{b}	252.90 ± 35.19^{c}
Springiness (mm)	0.94 ± 0.06^{a}	0.88 ± 0.08^{ab}	0.97 ± 0.05^{a}	1.04 ± 0.24^{a}	1.03 ± 0.22^{a}

Cohesiveness	0.16 ± 0.06^{d}	0.47 ± 0.16^{c}	0.72 ± 0.10^{ab}	0.69 ± 0.12^{b}	0.81 ± 0.04^{a}
Gumminess	33.22 ± 5.23^{e}	530.96 ± 37.47^{c}	1173.37 ± 190.45^{a}	837.75 ± 161.15^{b}	216.78 ± 32.98^{d}
Chewiness (mJ)	31.42 ± 6.46^{e}	411.36 ± 65.12^{b}	851.11 ± 135.15^{a}	138.20 ± 33.47^{d}	267.31 ± 45.74^{c}
Resilience	0.65 ± 0.01^{b}	0.61 ± 0.13^{b}	0.70 ± 0.10^{a}	0.48 ± 0.09^{c}	0.27 ± 0.02^{d}

Note: values are shown as mean ± SD. Different letters in the same row show significant differences ($p < 0.05$). CD Convective drying, RHCD Relative humidity convective drying, ID Infrared drying, FD Freeze-drying.

Table 1: Enzyme activities of fresh and dried pineapple slices under various processing conditions

Enzyme activities (U/g)	Fresh	CD	RHCD	ID	FD
PPO	0.34 ± 0.02^{a}	0.07 ± 0.02^{b}	0.04 ± 0.01^{bc}	0.02 ± 0.00^{c}	0.07 ± 0.02^{b}
POD	31.88 ± 1.38^{a}	7.49 ± 0.47^{d}	10.32 ± 1.23^{c}	5.16 ± 0.93^{e}	14.05 ± 1.65^{b}

Note: Values are mean ± SD. Different letters in the same row point out statistical differences ($p < 0.05$). PPO Polyphenol oxidase, POD peroxidase, CD Convective drying, RHCD Relative humidity convective drying, ID Infrared drying, FD Freeze-drying.

Comments 10

Conclusions

"The dehydration techniques influenced in a specific manner the investigated parameters as each dryer is based on a particular operation principle." - This sentence presents the obvious, if the drying methods were not different the whole work would not make sense.

Response:

Thank you for this insightful comment. The mentioned sentence was removed from the conclusion.

Comments 11

The summary should include a specific statement as to the optimal method from the point of view of various quality characteristics.

Response:

Thank you for this comment. This aspect is given in lines 592-595.

According to our findings, infrared drying is the optimal processing technology for dehydrating pineapple, considering drying time and different quality parameters. The ID had the lowest drying time with brighter color and reduced browning index, high rehydration capacity, excellent flavor profile, and a great ability to inactivate oxidative enzymes.