KORESPONDENSI ARTIKEL

Judul : The addition of soy milk to pineapple chellies as a complementary alternative to nutritious snacks for children

Jurnal : International Journal of Gastronomy and Food Science

Volume: 29 (2022) 100571

NO	AKTIVITAS	TANGGAL	KETERANGAN	HALAMAN
1	Manuscript submission	7 Maret 2022	Your manuscript submission - 878539	2
2	Confirming handling editor	7 Maret 2022	Manuscript will be handled by Editor-in-Chief Dr Juan Arboleya	3
3	Decision on submission	31 Mei 2022	Revision requested	5
4	Revision submitted	15 Juni 2022	Confirming submission	39
5	Confirming handling editor	15 Juni 2022	Manuscript will be handled by Editor-in-Chief Dr Juan Arboleya	40
6	Decision on submission	22 Juli 2022	Accepted	42
7	Galley proof	3 Agustus 2022	Galley proof	43
8	Corrections received	7 Agustus 2022	Galley proof	55
9	Published and share	19 Agustus 2022	Published	56

Confirming submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 7 March 2022 at 14:04
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

This is an automated message.

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

We have received the above referenced manuscript you submitted to International Journal of Gastronomy and Food Science.

To track the status of your manuscript, please log in as an author at https://www.editorialmanager.com/ijgfs/, and navigate to the "Submissions Being Processed" folder.

Thank you for submitting your work to this journal.

Kind regards,
International Journal of Gastronomy and Food Science

More information and support

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ijgfs/login.asp?a=r). Please contact the publication office if you have any questions.

Confirming handling editor for submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 7 March 2022 at 18:14
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

This is an automated message.

Manuscript Number: IJGFS-D-22-00128

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

The above referenced manuscript will be handled by Editor-in-Chief Dr Juan Arboleya .

To track the status of your manuscript, please log into Editorial Manager at https://www.editorialmanager.com/ijgfs/.

Thank you for submitting your work to this journal.

Kind regards,

International Journal of Gastronomy and Food Science

More information and support

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ijgfs/login.asp?a=r). Please contact the publication office if you have any questions.

Track the status of your submission to International Journal of Gastronomy and Food Science

1 message

Submission Tracker <no-reply@submissions.elsevier.com> 9 April 2022 at 21:30
To: d.nurafifah.dna@fk.undip.ac.id

Manuscript Number: IJGFS-D-22-00128
Manuscript Title: The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children
Journal: International Journal of Gastronomy and Food Science

Dear Diana Nur Afifah,

Your submitted manuscript is currently under review. The peer review process can take a while, so we are trying out a new service that allows you to track the peer review status of your submission in more detail. You can access the service here: https://track.authorhub.elsevier.com?uuid=330db9a1-362a-4fd0-aba0-2d255d11afc5

This page will remain active until the peer review process for your submission is completed. You can visit the page whenever you like to check the progress of your submission. The page does not require a login, so you can also share the link with your co-authors.

We hope you find this service useful.

Kind regards,
Journal Office of International Journal of Gastronomy and Food Science
Elsevier B.V.

Please note this is an automated message and will only be sent once.
For more information and support, please visit https://service.elsevier.com/app/answers/detail/a_id/5971/supporthub/publishing/

Decision on submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 31 May 2022 at 23:49
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

Manuscript Number: IJGFS-D-22-00128

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

Thank you for submitting your manuscript to International Journal of Gastronomy and Food Science.

I have completed my evaluation of your manuscript. The reviewers recommend reconsideration of your manuscript following minor revision and modification. I invite you to resubmit your manuscript after addressing the comments below. Please resubmit your revised manuscript by Jun 21, 2022.

When revising your manuscript, please consider all issues mentioned in the reviewers' comments carefully: please outline every change made in response to their comments and provide suitable rebuttals for any comments not addressed. Please note that your revised submission may need to be re-reviewed.

To submit your revised manuscript, please log in as an author at https://www.editorialmanager.com/ijgfs/, and navigate to the "Submissions Needing Revision" folder under the Author Main Menu.

International Journal of Gastronomy and Food Science values your contribution and I look forward to receiving your revised manuscript.

Kind regards,

Juan-Carlos Arboleya, PhD

Editor-in-Chief

International Journal of Gastronomy and Food Science

Editor and Reviewer comments:

The manuscript presents some interesting results about several quality parameters of pinnaple cellies fortified with different amounts of soy milk. The aim of experiment was clairly showed, however design of experiment, materials and methods as well as way of presenting results needs some further improvements.
Detailed remarks:
2. Methods
in description of soy milk preparation as well as chellies making please give more detailed information:
- what was the raw materials for soy milk preparation? (producer/origin ect.); please give information what was the amount of obtained soy milk. If the milk was not used as a fresh prepared in chellies making please add information about storage conditions
- please give information about the source of sodium alginate ect.; what dose it mean "pinnaple juice was generated'? it was fresh pressed??? please add infomation about amounts of obtained samples; also about the diameter of obtained chelies; how they were stored untill the time of analyses ect
- proximate analyses - please remove the name of laboratory where analyses were conducted - it can be mentioned in the beginning (and only one time); on the other hand please add as references norms ect.
- in general it should be also given information in how many repetition the experiment was conducted as well as single analyses
- please add references to point 2.4; remove the way of calculation as it it well known

- please add references to point 2.5 and 2.6 and 2.7
- please add the name of colorimeter used in color test; what scale was used to measurement? if CieLab then please use *; also add some references to this point
- please add references 2.9
- please add more information - what was the scale used in those tests? any references?

Table 1 - why there is no supercript letters with data: crude fiver, vit. C and calcium???
Table 3 - please check the way of writing L, a, b with *
Table 4 - please add what scale was used (points from ..to...)
table 5 - why there is no information in material and methods that yogurts were prepared? please add it? what was the amount of pinapple chellies added to yougurt ect?
-

*****
MethodsX (optional)

We invite you to submit a method article alongside your research article. This is an opportunity to get full credit for the time and money spent on developing research methods, and to increase the visibility and impact of your work. If your research article is accepted, we will contact you with instructions on the submission process for your method article to MethodsX. On receipt at MethodsX it will be editorially reviewed and, upon acceptance, published as a separate method article. Your articles will be linked on ScienceDirect.

Please prepare your paper using the MethodsX Guide for Authors: https://www.elsevier.com/journals/methodsx/2215-0161/gu

*****

Data in Brief (optional):

We invite you to convert your supplementary data (or a part of it) into an additional journal publication in Data in Brief, a multi-disciplinary open access journal. Data in Brief articles are a fantastic way to describe supplementary data and associated metadata, or full raw datasets deposited in an external repository, which are otherwise unnoticed. A Data in Brief article (which will be reviewed, formatted, indexed, and given a DOI) will make your data easier to find, reproduce, and cite.

You can submit to Data in Brief when you upload your revised manuscript. To do so, complete the template and follow the co-submission instructions found here: www.elsevier.com/dib-template. If your manuscript is accepted, your Data in Brief submission will automatically be transferred to Data in Brief for editorial review and publication.

Please note: an open access Article Publication Charge (APC) is payable by the author or research funder to cover the costs associated with publication in Data in Brief and ensure your data article is immediately and permanently free to access by all. For the current APC see: www.elsevier.com/journals/data-in-brief/2352-3409/open-access-journal

Please contact the Data in Brief editorial office at dib-me@elsevier.com or visit the Data in Brief homepage (www.journals.elsevier.com/data-in-brief/) if you have questions or need further information.

More information and support

FAQ: How do I revise my submission in Editorial Manager?

https://service.elsevier.com/app/answers/detail/a_id/28463/supporthub/publishing/

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use

International Journal of Gastronomy and Food Science

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

--Manuscript Draft--

Manuscript Number:	IJGFS-D-22-00128R1
Article Type:	Research Paper
Section/Category:	Science and gastronomy (chemistry, engineering, sensory science, microbiology)
Keywords:	nutrient content, antioxidants, physical properties, organoleptic quality, chellies, snacks
Corresponding Author:	Diana Nur Afifah Diponegoro University: Universitas Diponegoro Semarang, Central Java INDONESIA
First Author:	Diana Nur Afifah
Order of Authors:	Diana Nur Afifah
	Amy Febriani Hartono
	Ayu Tri Astuti
	Salmaa Novian Susilo Putri
	Enny Probosari
	Gemala Anjani
	Muflihatul Muniroh
	Nuryanto Nuryanto
	Aryu Candra
Abstract:	One of the strategies adopted to introduce fruits to youngsters is achieved by delivering pineapple chellies containing soy milk. This study, therefore, aims to determine the differences in nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies with the addition of suitable soy milk as a complementary alternative to children's nutritious snacks. Based on the weights and considerations, P 3 was selected as the best formulation, in terms of the nutrient content and contribution level of the chellies with adequate snack standards.
Suggested Reviewers:	Maria-Paz De Peña University of Navarra: Universidad de Navarra mpdepena@unav.es Because of her expertise in the field of food science and technology, she comes highly recommended as a reviewer. Antioxidants, Antioxidant Activity, Food Chemistry, Food Processing Food Analysis, Free Radicals, Sensory Analysis, and Food Composition are among her other areas of competence. Some of his research relates to the current topic, such as the impact of blanching and frying heating rate/time on the antioxidant capacity and (poly)phenols of cardoon stalks (Cynara cardunculus L. var. altilis DC) using the DPPH and ABTS methods, and the impact of cooking process on nutritional
	Patrícia Padrão University of Porto Faculty of Medicine: Universidade do Porto Faculdade de Medicina patriciapadrao@fcna.up.pt Patrcia Padro is an Auxiliary Professor at the Nutritionist Faculty of Nutrition and Food Sciences at the University of Porto. He is well-versed in nutrition and food science. As a result, he got great recommendations as a reviewer. Some of the publications discussed are related to our discussion of nutrient-dense alternative foods.
Response to Reviewers:	

Powered by Editorial Manager® and ProduXion Manager® from Aries Systems Corporation

Cover Letter

Diana Nur Afifah
Universitas Diponegoro
Jl. Prof Soedarto
Semarang, Jawa Tengah, Indonesia 1269
024-76402881
d.diananurafifah.dna@fk.undip.ac.id

Lead Editor Professor Juan-Carlos Arboleya, PhD and Professor Jorge Ruiz Carrascal, PhD
Journal of Gastronomy and Food Science

March 7th 2021

Dear Lead Editor:

I am pleased to submit an original research article entitled "the addition of soy milk to pineapple *chellies* as a complementary alternative to nutritious snacks for children" by Diana Nur Afifah, Amy Febriani Hartono, Ayu Tri Astuti, Salmaa Novian Susilo Putri, Enny Probosari, Gemala Anjani, Muflihatul Muniroh, Nuryanto, Aryu Candra for consideration for publication in *Journal of Gastronomy and Food Science*

In this manuscript, we show the effect of the addition of soy milk to pineapple *chellies* on variations containing 0%, 25%, 50%, and 75% soy milk. *Chellies* are semi-solid gel boba with an inherent liquid, which tends to break immediately during consumption, and does not cause a choking effect. These fruits are produced using the spherification technique based on their simple application, without additional processes, including heating. The addition of soy milk in the manufacture of pineapple *chellies* can increase protein, fat, calcium, and antioxidant activity while lowering carbohydrate, vitamin C, and the acceptability of pineapple skin (color, taste, aroma, and texture) when eaten with and without yogurt. Based on the weighting scores and considerations, P3 was selected as the best formulation, because the nutrient content and contribution level of this treatment are of good snack standards.

We believe that this manuscript is appropriate for publication by the *Journal of Gastronomy and Food Science* very related to the aims and scope of his journal. Our manuscript creates a paradigm for future studies of the evolution of functional food from Indonesian traditional food.

This manuscript has not been published and is not under consideration for publication elsewhere.

Thank you for your consideration!

Sincerely,

Dr. Diana Nur Afifah
Doctor, Department of Nutrition Science
Universitas Diponegoro

Author's Response to Reviewer's Comments

Manuscript title:
The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

	Reviewer's Comments	Author's Response
Title	-	-
Abstract	-	-
Keywords	-	-
Introduction	-	-
Methodology	1. what was the raw materials for soy milk preparation? (producer/origin ect.); please give information what was the amount of obtained soy milk. If the milk was not used as a fresh prepared in chellies making please add information about storage conditions	**Answer:** Revised. The raw materials for making soy milk are 250 grams of soybeans, 1250 ml of water, sugar 0,7 %, and NaHCO3 or baking soda 0,5 %. The amount of soy milk obtained in 250 grams is 1500 ml. The soy milk that will be tested is made on the same day. Soy milk was stored at 4 °C in a chiller.
	2. please give information about the source of sodium alginate ect.; what dose it mean "pinnaple juice was generated'? it was fresh pressed??? please add infomation about amounts of obtained samples; also about the diameter of obtained chelies; how they were stored untill the time of analyses ect	**Answer:** Revised. The source of sodium alginate has been added to the revised. *"Sodium alginate is a polymer that forms in cold conditions from algae or brown seaweed. In the food industry, sodium alginate is utilized as a thickener, stabilizer, gelling agent, and emulsifier."* **The phrase "pineapple juice was generated" now refers to pineapple that has been mixed. That sentence has been corrected.** *"The honey pineapple is washed and sliced before being mashed (mixed) with soy milk and 2% calcium lactate".* Chellies have a diameter ranging from 8 to 9 mm. Each chellies weighs approximately 5 grams. Chellies are only made when an analysis is to be carried out. Chellies were kept

		in plastic cup containers with plastic cup lids in the freezer at -19°C, labeled according to the treatment groups.
	3. proximate analyses - please remove the name of laboratory where analyses were conducted - it can be mentioned in the beginning (and only one time); on the other hand please add as references norms ect.	**Answer:** The correction has been done, The name of the laboratory that performed the analysis has been removed according recommendation from reviewer and authors added reference. *"AOAC. (2005). Official Method of Analysis of The Association of Official Analytical of Chemist. The Association of Official Analytical Chemyst, Inc."*
	4. in general it should be also given information in how many repetition the experiment was conducted as well as single analyses	**Answer:** This research was conducted with 4 treatments and 3 replications to obtain 12 experimental units for water content, ash content, protein, fat and carbohydrates.
	5. please add references to point 2.4; remove the way of calculation as it it well known	**Answer:** Done. In section 2.4, a reference has been added to the manuscript, and the calculating method has been removed *"Sami, F. J., & Rahimah, S. (2016). Antioxidant activity testing of brocolli (Brassica oleracea L. var. Italica) z DPPH (2.2 diphenyl-1-picrylhydrazyl) and ABTS (2.2 azinobis (3-ethylbenzothiazoline)-6-sulphonic acid) methods. Indonesian Journal of Phytopharmaceuticals, 2(2), 107–110.https://doi.org/10.33096/jffi.v2i2.179"*
	6. please add references to point 2.5	**Answer:** Done. A reference has been added to the manuscript in point 2.5 References: *"Sulaeman, A., Anwar, F., & Rimbawan, M. S. A. (1993). Method of analysis of nutrient composition of food. IPB University."*
	7. please add references to point 2.6	**Answer:** Done. A reference has been added to the manuscript in point 2.6. Reference: *"Sudarmadji, S., Haryono, B., & Suhardi. (1997). Analysis procedures for Foodstuffs and*

		Agriculture Fourth Edition (4 edition). Liberty Yogyakarta."
	8. please add references to point 2.7	**Answer:** Done. A reference has been added to the manuscript in point 2.7. Reference *"Sumantri, A. R. (2010). Food analysis. Gadjah Mada University Press, Yogyakarta."*
	9. please add the name of colorimeter used in color test; what scale was used to measurement? if CieLab then please use *; also add some references to this point	**Answer:** The name of the colorimeter that was used in the color test was included. The colorimeter used in the color test is CS-10 Colorimeter. The color scale was used in the color test is *"The brightness parameter is represented by the L* notation, which has a value range of 0 to 100 (black-white) with L as the parameter representing brightness (achromatic color, 0: black to 100: white). The notation a* denotes a red-green mixed chromatic color (a+ = 0-100 for red, a-= 0-(-80) for green), while the outcome for blue-yellow mixture was indicated by the notation b* value (b+ = 0-70 for yellow, b- = 0-(-70) for blue)"* Reference has been added to the manuscript "Taufik, Y., Sumartini, & Endriana, W. (2020). Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. *Pasundan Food Technology Journal*, *6*(3), 183–191. https://doi.org/10.23969/pftj.v6i3.2175"
	10. please add references 2.9	**Answer:** Reference has been added to the manuscript in section 2.9 *"Kusnadi, D. ., Bintoro, V. ., & Baarri, A. N. AL. (2012). Water holding capacity, level of elasticity and protein content in meatball combination of beef and rabbit meat. Journal of Applied Food Technology (JAFT), 1(2), 48. https://doi.org/10.21157/j.med.vet..v10i1.4038"*
	11. please add more information - what was the scale used in those	**Answer:** Done. A reference and a hedonic test measurement scale have been added.

	tests? any references?	"Panelists were asked to assess how much they liked the color, taste, and aroma of Chellies products. The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= Very dislike, 2 = dislike, 3 = like, 4 = Very like)" Reference: "Mareta, D. T. (2019). Hedonic Test method for measuring instant pindang seasoning powder preferences. *Journal of Science and Applicative Technology*, *3*(1), 34. https://doi.org/10.35472/jsat.v3i1.195"
Results and Discussion	-	-
Conclusion	-	-
References (Appropriateness)	-	-
Tables	12. Table 1 - why there is no supercript letters with data: crude fiver, vit. C and calcium???	**Answer:** Done. A superscript letter has been added to the crude fiber, vitamin C, and calcium statistics. Numbers followed by the same superscript letter indicate no significant difference Numbers followed by different superscript letters (a, b, c, d) indicate significant differences
	13. Table 3 - please check the way of writing L, a, b with *	**Answer:** Revised. the writing of L, a, and b has been adjusted Based on the reference "Taufik, Y., Sumartini, & Endriana, W. (2020). Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. Pasundan Food Technology Journal, 6(3), 183–191. https://doi.org/10.23969/pftj.v6i3.2175" The brightness parameter is represented by the **(L*)** notation, which has a value range of 0 to 100 (black-white) with L as the parameter representing brightness (achromatic color, 0: black to 100: white). The **notation (a*)** denotes a red-green mixed chromatic color (a+ = 0-100 for red, a-= 0-(-80) for green).The

		outcome for blue-yellow mixture was indicated by the **notation (b*)** value (b+ = 0-70 for yellow, b- = 0 -(-70) for blue)" Aside from that, the use of the sign (*) to indicate that the data was tested using the One Way Anova Test and the sign (**) to indicate that the data was tested using the Kruskal Wallis Test **has been changed** to be using the superscripts letters (^{1}) for the Kruskal Wallis Test and (^{2}) for the One Way Anova Test, respectively.
	14. Table 4 - please add what scale was used (points from ..to...)	**Answer:** Done. A hedonic test measurement scale has been added. The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like) Assuming the average value obtained between 2.65 to 3.30 is in "like" categories
	15. table 5 - why there is no information in material and methods that yogurts were prepared? please add it? what was the amount of pinapple chellies added to yougurt ect?	**Answer:** Done. More specific explanation about ingredients and methods related to the addition of yogurt has been added in the section method and material. The reason for applying yogurt to chellies is to see if there is an effect on acceptability when chellies are applied to a food or drink such as yogurt, this is because chellies are generally consumed as toppings. "The samples to be tested were chellies with various treatments P0 (100%), P1 (75%:25%), P2 (50%:50%), P3 (25%:75%) and chellies that have been applied as a topping on the snack, namely yogurt (Original Cimory Yogurt). The addition of yogurt is used to see if adding chellies to a food or beverage affects its acceptance. 1 tablespoon (5 grams) of yogurt is used as a topping for chellies"

Highlights

- The addition of soy milk in the manufacture of pineapple *chellies* increases the levels of protein, fat, calcium, and antioxidant activity
- The *chellies* carbohydrate and vitamin C levels decreased as the amount of soy milk added increased.
- The acceptance of pineapple *chellies* (color, taste, scent, and texture) is affected by the addition of soy milk, both when ingested with and without yogurt, with the panelists' preference level decreasing as the amount of soy milk added increases.

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Diana Nur Afifah[1*], Amy Febriani Hartono[1], Ayu Tri Astuti[1], Salmaa Novian Susilo Putri[1], Enny Probosari[1], Gemala Anjani[1], Muflihatul Muniroh[2], Nuryanto[1], Aryu Candra[1]

[1]Department of Nutrition Science, Faculty of Medicine, Diponegoro University, Semarang, Java 50275, Indonesia

[2] Department of Physiology, Faculty of Medicine, Diponegoro University, Semarang, Java 50275, Indonesia

*Corresponding author: d.nurafifah.dna@fk.undip.ac.id

Diana Nur Afifah ORCID ID: https://orcid.org/0000-0001-8808-1826

Enny Probosari ORCID ID: https://orcid.org/0000-0001-9860-5902

Gemala Anjani ORCID ID: https://orcid.org/0000-0002-7774-7693

Muflihatul Muniroh ORCID ID: https://orcid.org/0000-0003-0020-6722

Nuryanto ORCID ID: https://orcid.org/0000-0002-9279-106X

Aryu Candra ORCID ID: https://orcid.org/0000-0002-6103-607X

Revised Manuscript (Marked Version - Without author details)

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Abstract

One of the strategies adopted to introduce fruits to youngsters is achieved by delivering pineapple chellies containing soy milk. This study, therefore, aims to determine the differences in nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies with the addition of suitable soy milk as a complementary alternative to children's nutritious snacks. Based on the weights and considerations, P_3 was selected as the best formulation, in terms of the nutrient content and contribution level of the chellies with adequate snack standards.

Keywords; nutrient content, antioxidants, physical properties, organoleptic quality, chellies, snacks

1 Introduction

School-age children between 7-12 years commonly experience rapid growth and development. (Nuryanto et al., 2014). The 2018 Basic Health Research showed the behavior of the population aged ≥5 years with less fruit consumption rate at 95.5% (Ministry of Health Republic of Indonesia, 2018). This infrequent fruit intake possibly increases the risk of experiencing nutritional deficiencies, in terms of vitamins, minerals and fiber as well as disrupts the body's acid-base balance. According to Sousa (2022), The street food purchases studied were found to be energy-dense, with high amounts of saturated fat, trans-fat, and sodium, as well as low potassium content, all of which can have a negative effect on health over time (Sousa et al., 2022).

Acceptable children snack is expected to contain 20% of the daily energy adequacy rate with a ratio of 10-20% carbohydrates, 2-4% protein, and 4-6% fat or at least 300 kcal of energy, 5 g of protein, 8.3 g of fat and 45 g of carbohydrates for 100 g of snacks. There is also the need for micronutrients of approximately 27 mg of vitamin C, 7.2 g of crude fiber, and 330 mg of calcium in 100 g of snacks (National Agency for Drug and Food Control of Indonesia, 2016; Wiraningrum et al., 2015)

Pineapple chellies further serve as a preferred alternative snack in enhancing school children's interest, specifically in fruits. Chellies are semi-solid gel boba with an inherent liquid, which tends to break immediately during consumption, and does not cause a choking

effect (Slobodan et al., 2011). However, pineapple chellies appear incapable of fulfilling the minimum nutritional recommendations for an adequate snack. This circumstance necessitates the need to introduce other ingredients, including soy milk (Wiraningrum et al., 2015). Dairy products of nuts are suitable alternatives for school children, due to the affordability, sufficient calcium, and the absence of a fishy smell. Calcium is very critical for the growth of children's bones and teeth (Pravina et al., 2015).

Based on this background, pineapple chellies enriched with soy milk serve as a complementary nutritious snack for children. This inclusion is expected to increase the nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies. Therefore, it is necessary to analyze these characteristics of pineapple chellies with added soy milk as a complementary alternative to nutritious snacks.

2 Method

This study is categorized under food technology science based on a two-factor completely randomized experimental design. The raw materials consist of honey pineapple and soy milk.

2.1 Soy Milk Making

The soy milk was formulated at the Food Laboratory, Department of Nutrition Science, Faculty of Medicine, Diponegoro University. The raw materials for making soy milk are 250 grams of soybeans, 1250 ml of water, sugar 0,7 %, and NaHCO3 or baking soda 0,5 %. Several processes in its production include sorting, soaking, epidermis removal, boiling, grinding, filtration and heating. First, the impurities and damaged seeds were eradicated and the soybeans were then blanched/soaked with 0.5% NaHCO3 or baking soda for 15 minutes with water at 80ºC (soybean ratio of 3:1). This was followed by draining, washing, and peeling to separate the epidermis. The boiling process lasted for 30 minutes at 80ºC with water (soybean ratio of 5:1). These samples were then blended with water for 5 minutes (soybean ratio of 5:1) and the mashed soybeans were filtered with a filter cloth, followed by the addition of 7% sugar. The filtrate is then heated to 80°C and then boiled for 30 minutes at low heat until cooked. The amount of soy milk obtained in 250 grams is 1500 ml. The soy milk that will be tested is made on the same day. Soy milk was stored at 4 °C in a chiller~~The filtrate was then cooked to 80^{0}C with further boiling for 30 minutes using low heat~~ (Usydus et al., 2009; Yuliani, 2017).

Commented [I1]:
1. what was the raw materials for soy milk preparation? (producer/origin ect.); please give information what was the amount of obtained soy milk. If the milk was not used as a fresh prepared in chellies making please add information about storage conditions

Answer:

Revised.
The raw materials for making soy milk are 250 grams of soybeans, 1250 ml of water, sugar 0,7 %, and NaHCO3 or baking soda 0,5 %.
The amount of soy milk obtained in 250 grams is 1500 ml.
The soy milk that will be tested is made on the same day. Soy milk was stored at 4 °C in a chiller.

2.2 *Chellies Making*

The chellies were produced at the Food Laboratory, Department of Nutrition Science, Faculty of Medicine, Diponegoro University. First, a 2% solution of sodium alginate was formulated with 1 L of water. This liquid served as a medium for the formation of chellies spherification. Sodium alginate is a polymer generated from algae or brown seaweed that develops in cold environments. Sodium alginate is used as a thickener, stabilizer, gelling agent, and emulsifier in the food business (Szekalska et al., 2016). The honey pineapple is washed and sliced before being mashed (mixed) with soy milk and 2% calcium lactate. ~~The honey pineapple juice was generated and then mixed with soy milk, including 2% calcium lactate~~ Spherification (formation of chellies balls) occurred in the sodium alginate solution by dripping the juice mixture, followed by rinsing with water (Sen, 2017). Chellies have a diameter ranging from 8 to 9 mm. Each chellies weighs approximately 5 grams. Chellies are only made when an analysis is to be carried out. Chellies were kept in plastic cup containers with plastic cup lids in the freezer at -19°C, labeled according to the treatment groups.

2.3 *Proximate Analysis Test*

The protein content was determined using the Kjeldahl method ~~The protein content test was conducted at the Food Engineering Laboratory, Semarang University, using the Kjeldahl method~~ (AOAC, 2005). The fat content was determined using the Soxhlet method ~~The fat content test for chellies was conducted at the Food Engineering Laboratory, Semarang University, using the Soxhlet method~~(AOAC, 2005). The water content was determined by gravimetric method. The ash content was determined using the dry ashing method (AOAC, 2005).~~The water content test for chellies was performed at the Food Engineering Laboratory, Semarang University, using the gravimetric meth The ash content test for chellies was conducted at the Food Engineering Laboratory, Semarang University, using the dry ashing method~~ The carbohydrate content was analyzed by difference, where its composition was calculated by subtracting 100% of the ~~The carbohydrate content test was performed at the Food Engineering Laboratory, Semarang University, where its composition was calculated by subtracting 100% of the~~ nutrient content from the water, ash, protein, and fat components (Apriani et al., 2011). This research was conducted with 4 treatments and 3 replications to obtain 12 experimental units for water content, ash content, protein, fat and carbohydrates.

Commented [I2]:
2. please give information about the source of sodium alginate ect.; what dose it mean "pinnaple juice was generated'? it was fresh pressed??? please add infomation about amounts of obtained samples; also about the diameter of obtained chelies; how they were stored untill the time of analyses ect

Answer:
Revised.
The source of sodium alginate has been added to the revised.
"Sodium alginate is a polymer that forms in cold conditions from algae or brown seaweed. In the food industry, sodium alginate is utilized as a thickener, stabilizer, gelling agent, and emulsifier."

The phrase "pineapple juice was generated" now refers to pineapple that has been mixed. That sentence has been corrected.
"The honey pineapple is washed and sliced before being mashed (mixed) with soy milk and 2% calcium lactate".

Chellies have a diameter ranging from 8 to 9 mm. Each chellies weighs approximately 5 grams. Chellies are only made when an analysis is to be carried out. Chellies were kept in plastic cup containers with plastic cup lids in the freezer at -19°C, labeled according to the treatment groups.

Commented [I3]:
3. . proximate analyses - please remove the name of laboratory where analyses were conducted - it can be mentioned in the beginning (and only one time); on the other hand please add as references norms ect.

Answer:

The correction has been done, The name of the laboratory that performed the analysis has been removed according recommendation from reviewer and authors added reference.
"AOAC. (2005). *Official Method of Analysis of The Association of Official Analytical of Chemist*. The Association of Official Analytical Chemyst, Inc."

Commented [I4]:
4. in general it should be also given information in how many repetition the experiment was conducted as well as single analyses

Answer:
This research was conducted with 4 treatments and 3 replications to obtain 12 experimental units for water content, ash content, protein, fat and carbohydrates.

2.4 *Antioxidant Activity Test*

The antioxidant activity test for chellies was using the DPPH method (Sami & Rahimah, 2016). Samples of 0.01 g were added with 10 mL of methanol, and then vortexed until homogeneous state. 1000 ppm of the sample solution were pipetted up to 400 µL (80 ppm), 500 µL (100 ppm), 600 µL (120 ppm), 700 µL (140 ppm), and 800 µL (160 ppm), respectively. Absolute methanol of 5 mL was also added and vortexed until a homogeneous state. Approximately, 1 mL of DPPH solution was then introduced and vortexed until homogeneous before cooling for 30 minutes. The resulting samples were subsequently measured spectrophotometrically with a wavelength of 517 nm using a UV-Vis spectrophotometer. ~~The antioxidant capacity was expressed in Ascorbic Acid Equivalent Antioxidant Capacity (AEAC) using the following equation:~~

~~Antioxidant Activity = $\frac{Control\ abs. - Sample\ abs.}{Control\ abs.}$ x 100%~~

~~By plotting a curve from the sample, the resulting equation was then used to calculate the IC50 value:~~

~~IC50 value = 50% x Blank absorbance~~

2.5 *Vitamin C Test*

The vitamin C test was performed in duplicate ~~at the Chemistry Laboratory, Department of Nutrition Science, Diponegoro University,~~ using the iodimetry method (Sulaeman et al., 1993).~~.~~ First, about 200-300 g of the sample were weighed and blended until smooth. 25 g of the sample solution was introduced to 75 mL of distilled water and agitated vigorously, before being centrifuged or filtered. The filtrate was subsequently placed in a 100 mL volumetric flask where distilled water was added to a volume limit of 100 mL. This was followed by measuring 25 ml of the filtrate from the previous stage with the addition of 75 ml of distilled water and 25 ml of $H_2SO_4$2N solution before titrating with 0.1000 N standard solution of iodine, using starch solution as an indicator. Equivalence value: each mL of 0.1000 N iodine solution is equivalent to 8.8 mg of vitamin C.

2.6 *Crude Fiber Test*

Analysis of crude fiber content according to Sudarmadji (Sudarmadji et al., 1997). ~~was conducted at the Chem-mix Pratama Laboratory, Bantul Regency, Yogyakarta~~First, the sample was crushed and weighed up to 2 g, followed by the fat extraction process, using the

Commented [I5]:
5. please add references to point 2.4; remove the way of calculation as it it well known

Answer:

Done. In section 2.4, a reference has been added to the manuscript, and the calculating method has been removed

"Sami, F. J., & Rahimah, S. (2016). Antioxidant activity testing of brocolli (Brassica oleracea L. var. Italica) z DPPH (2.2 diphenyl-1-picrylhydrazyl) and ABTS (2.2 azinobis (3-ethylbenzothiazoline)-6-sulphonic acid) methods. *Indonesian Journal of Phytopharmaceuticals*, *2*(2), 107–110. https://doi.org/10.33096/jffi.v2i2.179"

Commented [I6]:
6. . please add references to point 2.5

Answer:
Done. A reference has been added to the manuscript in point 2.5
References:

"Sulaeman, A., Anwar, F., & Rimbawan, M. S. A. (1993). *Method of analysis of nutrient composition of food*. IPB University."

Commented [I7]:
7. please add references to point 2.6

Answer:
Done. A reference has been added to the manuscript in point 2.6.
Reference:

"Sudarmadji, S., Haryono, B., & Suhardi. (1997). *Analysis procedures for Foodstuffs and Agriculture Fourth Edition* (4 edition). Liberty Yogyakarta."

Soxhlet method. The resulting portion was then transferred to a 600 ml Erlenmeyer before the addition of 0.5 g of ignited asbestos and three drops of an anti-foam agent. About 200 ml of hot 1.25% H_2SO_4 were also introduced and covered with reverse cooling before boiling for 30 minutes with occasional shaking and then filtered.

Subsequently, the Erlenmeyer residue was washed with boiling water until no acidity was observed after testing with litmus paper. This sample was then transferred quantitatively from the filter paper back into the Erlenmeyer using a spatula. The side was washed again with 200 ml of boiling 1.25% NaOH solution until all the residue was obtained. Furthermore, the content was simmered on reverse cooling for 30 minutes and stirred occasionally. This was followed by additional filtering using a filter paper with a known weight or a gooch crucible ignited while washing with 10% K_2SO_4 solution. The resulting sample was again rinsed with boiling water and about 15 ml of 95% alcohol. Meanwhile, the filter paper or crucible with its contents was oven-dried at 110°C to constant weight for 1–2 hours and cooled in a desiccator before weighing. It is also important to reduce the weight of asbestos during usage.

2.7 Calcium Test

The calcium test was implemented at the Chemistry Laboratory, Semarang University, where the material was first destroyed by dry ashing. Subsequently, 20-100 ml of the dry ash solution was pipetted and placed in a 250 ml beaker before adding 25-50 ml of distilled water. About 10 ml of saturated ammonium oxalate solution and 2 drops of the metal red indicator were also introduced. The solution was prepared slightly alkaline by adding dilute ammonia and slightly acidic with minimal drops of acetic acid until a pink coloration was observed (pH 5.0). The sample was then heated two boiling and cooled for a minimum of 4 hours at room temperature, before filtering with Whatman filter paper no. 42 and rinsed with hot distilled water until the filtrate was free of oxalate. The filtrate from the last filter should be Cl-free by testing with AgNO3 if HCl was used in preparing the ash solution. Furthermore, the end of the filter paper was perforated with a glass rod, and the filtrate was rinsed before being transferred to the beaker containing calcium with hot dilute H2SO4. The filtrate was then rinsed with hot water at 70-80°C before titrating with 0.01 N KMnO4 until the first persistent pink solution was obtained. The filter paper was added next, and the titration was repeated until the second persistent pink hue was achieved (Sumantri, 2010).

Commented [I8]:
8. please add references to point 2.7

Answer:
Done. A reference has been added to the manuscript in point 2.7.
Reference
"Sumantri, A. R. (2010). *Food analysis*. Gadjah Mada University Press, Yogyakarta."

2.8 *Color Test*

The color test on chellies was conducted in 3 repetitions at the Diponegoro University Integrated Laboratory, using a digital colorimeter (CS-10 Colorimeter). First, the samples were placed into the line of the paper box before pressing the IChat program, video, and video preview. The cursor was then directed to the four sides of the video preview, while the analysis results were shown on the display unit.

Also, the measurement produced L, a, and b values. The brightness parameter is represented by the L* notation, which has a value range of 0 to 100 (black-white). The notation a* denotes a red-green mixed chromatic color (a+ = 0-100 for red, a-= 0-(-80) for green), while the outcome for blue-yellow mixture was indicated by the notation b* value (b+ = 0-70 for yellow, b- = 0-(-70) for blue) (Taufik et al., 2020) ~~.Also, the measurement produced L, a, and b values, with L as the parameter representing brightness (achromatic color, 0: black to 100: white). The chromatic color of the red-green mixture is indicated by the a value (a+ = 0-100 for red, a = 0 (-80) for green), while the outcome for blue-yellow mixture was indicated by the b value (b+ = 0-70 for yellow, b- = 0 (-70) for blue).~~

2.9 *Hardness and Elasticity Test*

The hardness and elasticity tests were both performed with the Brookfield CT3 texture analyzer at the Diponegoro University Integrated Laboratory (Kusnadi et al., 2012). The needle (probe) was installed and positioned until it was close to the sample. This type consists of a cylindrical probe with a diameter of 1 cm and speed of 1.0 mm/s, while the trigger was set in a 3-mile formation. The sample was placed on the sample testing then the probe moved downwards which was driven by a load cell to press the sample and then returned to the top. Subsequently, the value of the analysis results was shown on the display unit. TPA curves were analyzed for both the hardness and elasticity tests. The hardness value refers to the amount of compressive force in suppressing the solid products as indicated by the absolute (+) peak, which is the maximum force with units of gram force (gf) while the elasticity value was measured in millimeters (mm). Furthermore, the test was performed with 3 repetitions.

2.10 *Chellies Acceptance Rate Analysis*

The organoleptic quality test involved asking 40 untrained panelists. The samples to be tested were chellies with various treatments P0 (100%), P1 (75%:25%), P2 (50%:50%), P3 (25%:75%) chellies that have been applied as a topping on the snack, namely yogurt

Commented [I9]:
9. please add the name of colorimeter used in color test; what scale was used to measurement? if CieLab then please use *; also add some references to this point

Answer:
The name of the colorimeter that was used in the color test was included.
The colorimeter used in the color test is CS-10 Colorimeter.

The color scale was used in the color test is
"The brightness parameter is represented by the L* notation, which has a value range of 0 to 100 (black-white) with L as the parameter representing brightness (achromatic color, 0: black to 100: white). The notation a* denotes a red-green mixed chromatic color (a+ = 0-100 for red, a-= 0-(-80) for green), while the outcome for blue-yellow mixture was indicated by the notation b* value (b+ = 0-70 for yellow, b- = 0-(-70) for blue)"

Reference has been added to the manuscript
"Taufik, Y., Sumartini, & Endriana, W. (2020). Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. *Pasundan Food Technology Journal*, *6*(3), 183–191. https://doi.org/10.23969/pftj.v6i3.2175"

Commented [I10]:
10. . please add references 2.9

Answer:
Reference has been added to the manuscript in section 2.9
"Kusnadi, D. ., Bintoro, V. ., & Baarri, A. N. AL. (2012). Water holding capacity, level of elasticity and protein content in meatball combination of beef and rabbit meat. *Journal of Applied Food Technology (JAFT)*, *1*(2), 48. https://doi.org/10.21157/j.med.vet..v10i1.4038"

Commented [I11]:
11. please add more information - what was the scale used in those tests? any references?

Answer:

Done. A reference and a hedonic test measurement scale have been added.

"Panelists were asked to assess how much they liked the color, taste, and aroma of Chellies products. The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like)"

Reference:
"Mareta, D. T. (2019). Hedonic Test method for measuring instant pindang seasoning powder preferences. *Journal of Science and Applicative Technology*, *3*(1), 34. https://doi.org/10.35472/jsat.v3i1.195"

(Original Cimory Yogurt). The addition of yogurt is used to see if adding chellies to a food or beverage affects its acceptance. 1 tablespoon (5 grams) of yogurt is used as a topping for chellies. Panelists were asked to assess how much they liked the color, taste, and aroma of Chellies products. The evaluation of the hedonic test was categorized into ascale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like) (Mareta, 2019).~~Also, the sample was assessed with a choice of 4 scales, including strongly like, like, dislike, and strongly dislike.~~

2.11 Best Formulation Analysis

The best formulation was selected using a weighting technique on the test results for macronutrient content and antioxidant activity of the chellies. Initial weighting was performed based on the aspect of the chellies' contribution to the snack standard, while the value specified for 25% for each treatment was in accordance with the parameter analyzed. Furthermore, each formula was measured according to the test, and the highest value was specified as the maximum score.

2.12 Data Analysis

The data analysis process was conducted using the statistics Software program and its normality was tested with Saphiro-Wilk because the number of samples occurred below 50. The protein content, crude fiber, physical properties of hardness, elasticity, and an acceptance rate of the pineapple chellies were also examined using Kruskal Wallis followed by the Mann Whitney test. Meanwhile, the water content, ash, fat, carbohydrate, vitamin C, calcium, antioxidant activity, IC50 value, and the color properties of the pineapple Chellies were evaluated using ANOVA (Analysis of Variance), followed by the Bonferroni post hoc test the occurrence of a variation. The results showed that the effect of the independent variable on the dependent variable was considered significant with the p-value ≤ 0.05.

3 Result And Discussion

3.1 The Nutrient Content of Pineapple Chellies Containing Soy Milk

The protein, fat, water content, ash content and carbohydrate content of chellies ranged from 0.49–4.80%; 0.19-1.03% ; 5.63-6.07%; 0.16-0.27; 87.28-93.50%. **(Table 1)** shows the results of the proximate analysis of Chellies. The rise in the chellies' protein content with an increase in the soy milk content is influenced by the composition of soy milk. Soybeans

contain complete essential amino acids which help to maintain the balance of the body's metabolism. Processed soybeans also contain easier digestible proteins (Santosa & Suliana, 2009)

The rise in the chellies' fat content with an increase in the soy milk content is influenced by the composition of soy milk. This is attributed to the higher fat content, compared to pineapple. Honey pineapple contains 0.12 g/100 g of fat, while soy milk contains 2.03 g/100 g. According to a previous study, the total fat content of a food sample depends on the fat content of the food ingredients as well as other ingredients added to the food (Setiyono, 2008). Honey pineapple is composed of 86% water and this water content decreases after processing into chellies. Furthermore, the use of sodium alginate and calcium lactate in the production of pineapple chellies also influences the water content. According to previous studies, sodium alginate has an excellent water-absorbing ability, while calcium lactate results in lower water content and is significantly different in Sukade products (Ratnasari et al., 2012; Wardani et al., 2009).

The ash content of the chellies increased with the addition of soy milk because soy milk has a higher ash content (0.53%), compared to honey pineapple (0.22%). In addition, the carbohydrate content of chellies in all treatment groups reduced with an increase in the content of soy milk because the addition of soy milk tends to increase the water content of the chellies, consequently, decreasing the carbohydrate content of the remaining mass.

According to the ALG (Nutrition Label Reference), the crude fiber content of processed food is 6 g (National Agency for Drug and Food Control of Indonesia, 2016). Therefore, processed food containing at least 3.6 g/100 g are believed to be a source of crude fiber, while those greater than 7.2 g/100 g are assumed to be rich in fiber. The crude fiber content of the chellies increased with an increase in the soy milk content because soy milk contains a polysaccharide group consisting of arabinogalactan and water-insoluble cellulose materials (Nilasari et al., 2017).

The highest vitamin C content of 6.63 mg/100 g was recorded for treatment P0. Based on the ALG regulations (Nutrition Label Reference), processed food is believed to be a source of vitamin C, particularly in cases where the material is characterized by at least 15% of solid form or 7.5% in the liquid state. The ALG stipulated vitamin C content of processed food is 90 mg (National Agency for Drug and Food Control of Indonesia, 2016), thus, processed food containing at least 13.5 mg/100 g is believed to be a source of vitamin C, while those with 27 mg/100gram or more are assumed to be enriched.

In this study, the reduction in the vitamin C content occurred due to the vitamin's labile nature. Vitamin C is easily damaged by exposure to light, high temperatures, the presence of oxygen, and processing (Putri & Setiawati, 2015; Razak et al., 2012). The peeling of pineapples causes the meeting of polyphenol oxidase (PPO) with phenolic components to experience enzymatic browning, producing a brown color. This process has the capacity to a reduction of up to 41.8% in vitamin C content (Putri & Setiawati, 2015). Recent research by Huarte (2021) shows that several thermolabile antioxidants, like vitamins, can be degraded during culinary processes (Huarte et al., 2021).

The highest calcium content of 491 mg/100 g was recorded for treatment P3 (25% honey pineapple and 75% soy milk), which is classified as high-calcium food. These processed food are said to be a good source, particularly in cases where the sample contains at least 15% of the ALG requirement in solid form or 7.5% in liquid state. According to the ALG regulations, the calcium content of processed food is 1100 mg (Sami & Rahimah, 2016). Hence, samples with at least 165 mg/100 g are classified as a good source, while those greater than 330 mg/100 g are considered to be enriched. The process of dropping gel chellies in a bath containing sodium alginate creates bond interactions between alginate and calcium where cross-links occur to form chelate bonds (Sa et al., 2019; Tsai et al., 2017). Alginate which is soluble in water forms a gel in an acidic solution due to the presence of calcium, therefore, the addition of calcium lactate as a coagulant is bound to increase the calcium content.

3.2 Antioxidant Activity

The antioxidant activity of the chellies increased with an increase in the soy milk content, with the highest and least values being 34.99% and 17.28%, respectively. **(Table 2)** shows the results Antioxidant Activity. The IC50 values of chellies in all treatment groups are classified as very weak antioxidants because the sample tested is in the form of crude extract, which is assumed to contain other compounds, for instance, salt, minerals, and other nutrients with the ability to inhibit the antioxidant activity (Wikanta et al., 2005).

Another factor responsible for the chellies' weak antioxidant activities is that the flavonoids in soy milk may still be glycosides, which are known to reduce antioxidant activity (Zaheer & Akhtar, 2017). Unfermented processed soybeans, including soy milk, have a 99% composition of isoflavones in the form of glycosides conjugated by binding to one

sugar molecule. Furthermore, pineapple has an IC50 value of 1549.88 ppm which is classified as a very weak antioxidant.

3.3 Hardness, Elasticity and Color of Pineapple Chellies Containing Soy Milk

The differences in the hardness of each treatment are influenced by the thickness of the gel layer composing the chellies (Bubin et al., 2019). **(Table 3)** shows the results physical properties of pineapple chellies containing soy milk. In this study, pineapples were produced through reverse spherification, a technique where pineapple juice, honey, and soy milk are mixed with calcium lactate and then dripped into a bath filled with sodium alginate liquid. However, this technique is limited because the main ingredients (honey pineapple liquid and soy milk) must have high density with the consistency of heavy cream to penetrate the sodium alginate solution which also has a high density, and obtain a good chellies shape (Sen, 2017).

An increase in the content of soy milk is bound to reduce to lighten the consistency of chellies, thereby reducing the hardness of the chellies membrane layer. Similarly, the elasticity is affected by the thickness of the gel layer that forms the chellies, which is influenced by the consistency of the main ingredients. The L* value obtained in this study indicates that the pineapple chellies generally have a fairly bright color. However, an increase in the soy milk content tends to reduce this brightness, causing the chellies to become pale yellow. These results are in line with a previous study on the manufacture of yogurt with soy milk, where the color brightness decreased with the addition of soy milk (Kazemi et al., 2013).

3.4 Organoleptic Quality Test of Pineapple Chellies Containing Soy Milk

The addition of soy milk resulted in pale-colored chellies, which the panelists did not like. **(Table 4)** shows the results organoleptic quality of pineapple chellies containing soy milk. This is in line with a previous study on ice cream production where the addition of soy milk resulted in a darkened and pale color (Kusumastuti & Adriani, 2017). The presence of riboflavin in soybeans is responsible for the yellowish color of soy milk (Handayani & Wulandari, 2016).

Furthermore, the preferred taste of chellies is the typical sweet, slightly sour, and fresh taste of pineapple (Kumar et al., 2016). The distinctive and fresh pineapple aroma was preferred by the panelists who disclosed that the addition of soy milk resulted in an

unpleasant soy aroma (Endrasari & Nugraheni, 2012). This aroma is caused by the presence of volatile carbonyl groups such as n-hexanal, which results from the oxidation of unsaturated fatty acids in soybean seeds due to the lipoxygenase enzyme's activity (Nizori et al., 2008).

The texture of the chellies is influenced by the production technique used and the thickness of the main ingredients (Sen, 2017). Certain panelists disliked the texture of P3 chellies because the chellies were too light because of the thin gel layer, resulting in a poor breaking sensation. This result is not in line with the theory previously described in the analysis of hardness and elasticity, where a good breaking sensation (breaks easily) due to a thin gel layer, was most preferred.

3.5 Organoleptic Quality Test of Pineapple Chellies with the Addition of Soy Milk Applied to Yogurt

The results showed the addition of soy milk had a significant effect on the color, aroma, taste, and texture parameters of chellies applied to yogurt. **(Table 5)** shows the results organoleptic quality of pineapple chellies with the addition of soy milk applied to yogurt. The bright yellow color of P0 chellies is quite a contrast to the white color of yogurt, therefore, this treatment was considered more attractive by the panelists, compared to the colors of other treatments which became paler with an increase in the soy milk content (Handayani & Wulandari, 2016).

The unpleasant aroma of soy milk caused by the action of the lipoxygenase enzyme in soybeans also influenced the aroma of the chellies (Endrasari & Nugraheni, 2012; Nizori et al., 2008). However, some panelists considered the aroma of yogurt more dominant than the aroma of the chellies.

Several panelists also considered the taste of yogurt more dominant, compared to the chellies. However, the results showed most panelists preferred chellies with little or no soy milk because the distinctive unpleasant taste of soy milk combined with the sour taste of yogurt was disliked by the panelists (Pramono et al., 2011). The panelists' preference for the chellies' texture also decreased with an increase in the soy milk content, because an increase in the soy milk content reduces the thickness of the chellies' membrane layer, making it easier to break when consumed (Sen, 2017). According to the panelists, chellies that break easily cause no contrasting texture between chellies and yogurt, and do not produce a good breaking sensation upon consumption.

4 Conclusion

This study's findings show a significant difference in the mean of macronutrient contents, vitamin C content, crude fiber, antioxidant activity, hardness, and color of pineapple chellies, with the addition of soy milk ($p<0.05$). The addition of soy milk in the manufacture of pineapple chellies can increase protein, fat, calcium, and antioxidant activity while lowering carbohydrate, vitamin C, and the acceptability of pineapple skin (color, taste, aroma, and texture) when eaten with and without yogurt. Based on the weighting scores and considerations, P3 was selected as the best formulation, because the nutrient content and contribution level of this treatment are of good snack standards.

5 Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

6 Funding

Directorate of Research and Community Service, Directorate General of Research and Development Strengthening Ministry of Research, Technology and Higher Education of the Republic of Indonesia In accordance with the Agreement on the Assignment of the Implementation of the Community Service Program No: 103-37/UN7.P4.3/PM/2019.

References

AOAC. (2005). *Official Method of Analysis of The Association of Official Analytical of Chemist*. The Association of Official Analytical Chemyst, Inc.

Apriani, R. ., Arpah, M., & Setyadjit. (2011). Composite flour formulation of taro flour, mung bean and banana flour in making baked brownies. *Scientific Journals and Food Science Research*, *2*, 1–18.

Bubin, S. F. A., Ali, S. M., Shukri, R., Ibadullah, W. Z. W., Ramli, N. S., Mustapha, N. A., & Rashedi, I. F. M. (2019). Characterization and stability of pitaya pearls from hydrocolloids by reverse spherification. *International Journal of Food Properties*, *22*(1), 1353–1364.

Endrasari, R., & Nugraheni, D. (2012). Effect Of Soymilk With Various Processing Methods For Organoleptic Acceptability. *Proceedings of the National Seminar on Yard Optimization, Semarang*, *6*(November), 468–475.

Handayani, M. N., & Wulandari, P. (2016). The effect of adding different types of milk on the characteristics of soyghurt. *Journal of Agricultural Industrial Technology*, *10*(2), 62. https://doi.org/10.21107/agrointek.v10i2.2467

Huarte, E., Juániz, I., Cid, C., & de Peña, M.-P. (2021). Impact of blanching and frying heating rate/time on the antioxidant capacity and (poly)phenols of cardoon stalks (Cynara cardunculus L. var. altilis DC). *International Journal of Gastronomy and Food Science*, *26*, 100415. https://doi.org/10.1016/j.ijgfs.2021.100415

Kazemi, A., Mazloomi, S. M., Hassanzadeh-Rostami, Z., & Akhlaghi, M. (2013). Effect of adding soymilk on physicochemical, microbial, and sensory characteristics of probiotic fermented milk containing Lactobacillus acidophilus. *Iranian Journal of Veterinary Research*, *15*(3), 206–210.

Kumar, K., Chandra, S., & Kumar, V. (2016). Medico-nutritional importance and value added products of pineapple. *A Review*, *2*(1), 290–298.

Kusnadi, D. ., Bintoro, V. ., & Baarri, A. N. AL. (2012). Water holding capacity, level of elasticity and protein content in meatball combination of beef and rabbit meat. *Journal of Applied Food Technology (JAFT)*, *1*(2), 48. https://doi.org/10.21157/j.med.vet..v10i1.4038

Kusumastuti, S., & Adriani, M. (2017). The Effect of Soymilk Substitution and Mocaf (Modified Cassava Flour) to the Acceptance, Fiber Content, and Product Economic Value of Red Dragon Ice Cream. *Amerta Nutrition*, 252–260.

https://doi.org/10.20473/amnt.v1.i3.2017.
Mareta, D. T. (2019). Hedonic Test method for measuring instant pindang seasoning powder preferences. *Journal of Science and Applicative Technology*, *3*(1), 34. https://doi.org/10.35472/jsat.v3i1.195
Ministry of Health Republic of Indonesia. (2018). *Riskesdas 2018 main results* (pp. 1–200).
National Agency for Drug and Food Control of Indonesia. (2016). *Nutrition facts Label*.
Nilasari, O. W., Susanto, W. H., & Maligan, J. M. (2017). The Effect of Temperature and Length of Cooking to Pumpkin Lempok Characteristic. *Journal of Food and Argoindustry*, *5*(3), 15–26.
Nizori, A., Suwita, V., Surhaini, Mursalin, Melisa, Sunarti, T. C., & Warsiki, E. (2008). Making sinbiotic soyghurt as a functional food with the addition of mixed culture Streptococcus thermophillus, Lactobacillus bulgaricus AND Lactobacillus acidophilus. *Journal of Agricultural Industrial Technology*, *18*(1), 28–33.
Nuryanto, Pramono, A., Puruhita, N., & Muis, S. F. (2014). The effect of nutrition education on knowledge and attitude of nutrition among school children. *Indonesian Journal of Nutrition*, *3*(1), 32–36. https://doi.org/10.20473/mgi.v12i2.183-190
Pramono, Y., Nurwantoro, Maskuri, & Dwiloka, B. (2011). *Microbiological, chemical, physical, and organoleptic characteristics of yogurt with the addition of red sweet potato*. Faculty of Animal Husbandry, Diponegoro University.
Pravina, P., Sayaji, D., & Avinash, M. (2015). Calcium and its role in human body. *International Journal of Research in Pharmaceutical and Biomedical Sciences*, *4*(2), 659–666.
Putri, M. P., & Setiawati, Y. H. (2015). Analysis levels of vitamin c in fruit fresh pineapple (Ananas comosus (L.) Merr) and fruit canned pineapple with UV- VIS spectrophotometry method. *Wiyata Journal*, *2*(1), 34–38.
Ratnasari, L., Ristiarini, S., & Endang, T. (2012). Effect of calcium salt types and storage period to succade of endodermis layer of melon (Cucumis melo L). *Journal of Food Technology and Nutrition*, *11*(2), 9–17.
Razak, A. R., Sumarni, N. K., & Rahmat, B. (2012). Optimization of Sucrose Hydrolysis Using Sulfonate Type Cation Exchange Resin. *Journal of Natural Science*, *1*(1), 119–131.
Sa, G., Aa, K., & Tr, S. (2019). Characterization of flavoured sweet water balls prepared by basic spherification technique. *International Journal of Chemical Studies*, *7*(1), 1714–1718.

Sami, F. J., & Rahimah, S. (2016). Antioxidant activity testing of brocolli (Brassica oleracea L. var. Italica) z DPPH (2.2 diphenyl-1-picrylhydrazyl) and ABTS (2.2 azinobis (3-ethylbenzothiazoline)-6-sulphonic acid) methods. *Indonesian Journal of Phytopharmaceuticals*, *2*(2), 107–110. https://doi.org/10.33096/jffi.v2i2.179

Santosa, B., & Suliana, G. (2009). The Effect of soybean varieties on the quality of tofu produced. *Journal of Science World*, *9*(2), 137–140. https://jurnal.unitri.ac.id/index.php/buanasains/article/view/233

Sen, D. J. (2017). Cross linking of calcium ion in alginate produce spherification in molecular gastronomy by pseudoplastic flow. *Journal of Pharmaceutical Sciences*, *5*(1), 1–10. https://doi.org/10.1002/jps.2600800102

Setiyono. (2008). *Restructuring beef for health food: a study on Rattus Norvegicus L*. Graduate School of Gadjah Mada University, Yogyakarta.

Slobodan, I., Mikinac, K., & Perman, L. (2011). Molecular gastronomy in function of scientific implementation in practice. *Journal of Economics*, *2*(2), 139–150.

Sousa, S., Albuquerque, G., Gelormini, M., Casal, S., Pinho, O., Damasceno, A., Moreira, P., Breda, J., Lunet, N., & Padrão, P. (2022). Nutritional content of the street food purchased in Chișinău, Moldova: Opportunity for policy action. *International Journal of Gastronomy and Food Science*, *27*(August 2021), 0–4. https://doi.org/10.1016/j.ijgfs.2021.100456

Sudarmadji, S., Haryono, B., & Suhardi. (1997). *Analysis procedures for Foodstuffs and Agriculture Fourth Edition* (4 edition). Liberty Yogyakarta.

Sulaeman, A., Anwar, F., & Rimbawan, M. S. A. (1993). *Method of analysis of nutrient composition of food*. IPB University.

Sumantri, A. R. (2010). *Food analysis*. Gadjah Mada University Press, Yogyakarta.

Szekalska, M., Pucilowska, A., Szymanska, E., Ciosek, P., & Winnicka, K. (2016). Alginate : Current use and future perspectives in pharmaceutical and biomedical applications. *International Journal of Polymer Science*, 1–17.

Taufik, Y., Sumartini, & Endriana, W. (2020). Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. *Pasundan Food Technology Journal*, *6*(3), 183–191. https://doi.org/10.23969/pftj.v6i3.2175

Tsai, F. H., Chiang, P. Y., Kitamura, Y., Kokawa, M., & Islam, M. Z. (2017). Producing liquid-core hydrogel beads by reverse spherification: Effect of secondary gelation on physical properties and release characteristics. *Food Hydrocolloids*, *62*(7), 140–148.

https://doi.org/10.1016/j.foodhyd.2016.07.002

Usydus, Z., Richert, J. ., & Adamczyk, M. (2009). Protein quality and amino acid profiles of fish products available in Poland. *Food Chemistry*, *112*(1), 139–145.

Wardani, W. D., Kawiji, & Manuhara, G. J. (2009). Isolation and characterization of sodium alginate from brown algae Sargassum sp. for making tenggiri (Scomberomorus commerson) meatballs. *Biofarmasi*, *7*(2), 59–67.

Wikanta, T., Januar, H. I., & Nursid, M. (2005). Antioxidant activity test, toxicity, and cytotoxicity red algae extract Rhodymenia palmata. *Indonesian Fisheries Research Journal*, *11*(4), 41. https://doi.org/10.15578/jppi.11.4.2005.41-49

Wiraningrum, E. A., Pudjirahaju, A., & Setyobudi, S. I. (2015). Food snacks school children (PJAS), adequate energy and nutrition for elementery school. *Indonesian Journal of Health Information*, *1*(1), 25–33.

Yuliani, C. (2017). The Effect of Soybean Types (Glycine max L.) and Blanching Time on the Physico- Chemical and Sensory Evaluation of Soymilk Powder. *Journal of Agricultural Technology*, *12*(2), 45–52.

Zaheer, K., & Akhtar, H. (2017). An updated review of dietary isoflavones: Nutrition, processing, bioavailability and impacts on human health. *Crit. Rev. Food Sci. Nutr*, *57*, 1280–1293.

TABLES

Table 1: The Results of the Proximate Analysis of Chellies

Nutrient content (%)	P0	P1	P2	P3
Protein[1]	0.49 ± 000[a]	1.37 ± 0.02[b]	3.02 ± 0.02[c]	4.80 ± 0.04[d]
Fat[2]	0.19 ± 0.00[a]	0.63 ± 0.00[b]	0.73 ± 0.00[c]	1.03 ± 0.03[d]
Water content[2]	5.63 ± 0.03[a]	5.77 ± 0.03[b]	5.92 ± 0.03[c]	6.07 ± 0.04[d]
Ash content[2]	0.16 ± 0.00[a]	0.19 ± 0.01[b]	0.21 ± 0.00[c]	0.27 ± 0.02[d]
Carbohydrate[2]	93.50 ± 0.0[a]	92.02 ± 0.06[b]	90.09 ± 0.06[c]	87.82 ± 0.11[d]
Crude Fiber[1]	2.09±0.01[a]	3.75±0.22[b]	4.13±0.38[c]	4.24±0.39[d]
Vitamin C[2]	6.63±0.40[a]	5.46±0.50[b]	4.36±0.32[c]	3.43±0.32[d]
Calcium[2]	4.02±0.50[a]	4.38±0.39[a]	4.84±0.32[a]	4.91±0.43[a]

Description: Numbers followed by different superscript letters (a, b, c, d) indicate significant differences,[1]Kruskal-Wallis test; [2]One Way Anova test. n= 12 (4 experiments ×3 replications) for proximate analysis.

Table 2: The Antioxidant Activity of Pineapple Chellies Containing Soy Milk

Treatment	Antioxidant Activity (%)	IC50 (ppm)
P_0 (Control)	17.28 ± 0.93*	16915.83 ± 58.97
P_1 (75% honey pineapple and 25% soy milk)	20.05 ± 0.56*	14203.84 ± 4176.10
P_2 (50% honey pineapple and 50% soy milk)	27.83 ± 0.51*	12617.25 ± 180.51
P_3 (25% honey pineapple and 75% soy milk)	34.99 ± 0.73*	10106.54 ± 2800.81
	p<0.001[a]	p=0.056[a]

Description: the sign (*) indicates a significant difference in the mean values. [a]=One Way Anova Test

Commented [I12]:
12. Table 1 - why there is no supercript letters with data: crude fiver, vit. C and calcium???

Answer:
Done. A superscript letter has been added to the crude fiber, vitamin C, and calcium statistics.
Numbers followed by the same superscript letter indicate no significant difference
:Numbers followed by different superscript letters (a, b, c, d) indicate significant differences

Table 3: The Physical Properties of Pineapple Chellies containing Soy Milk

Physical Properties		P0	P1	P2	P3
Hardness[1**]		40.17 ± 3.04[a]	36.92 ± 5.49[a]	34.83 ± 12.56[a,c]	29.92 ± 1.86[b,c]
Elasticity [1**]		2.10 ± 0.10[a]	2.13 ± 0.21[a]	2.23 ± 0.06[a]	2.33 ± 0.06[a]
Color	**(L*)**[2]	60.43 ± 6.68[a]	64.,66 ± 5.71[a]	61.98 ± 2.75[a]	52.80 ± 0.9[a]
	(a*)[1]	-5.71 ± 1.37[a]	-6.27 ± 1.19[a]	-7.16 ± 0.56[a]	-5.70 ± 0.52[a]
	(b*)[2]	43.84 ± 7.49[a]	43.62 ± 5.62[a]	33.65 ± 0.96[a]	17.44 ± 0.77[b]

Description: Numbers followed by different superscript letters (a, b, c) indicate significant differences, [1]Kruskal-Wallis test; [2]One Way Anova test.[*]~~One Way Anova Test~~ [**]~~Kruskal Wallis Test~~

Table 4: The Organoleptic Quality of Pineapple Chellies Containing Soy Milk

Treatment	**Acceptance** (Mean ± SD)			
	Color	**Aroma**	**Taste**	**Texture**
P0	3.15 ± 0.53[a] (Like)	3.30 ± 0.56[a] (Like)	3.10 ± 0.78[a] (Like)	2.88 ± 0.72 (Like)
P1	3.25 ± 0.49[a,c] (Like)	3.05 ± 0.64[a,c,d] (Like)	3.05 ± 0.75[a] (Like)	3.08 ± 0.73 (Like)
P2	3.03 ± 0.48[a,d] (Like)	2.93 ± 0.62[b,c] (Like)	2.65 ± 0.74[b] (Like)	3.00 ± 0.78 (Like)
P3	2.58 ± 0.71[b] (Like)	2.85 ± 0.80[b,d] (Like)	2.58 ± 0.81[b] (Like)	2.65 ± 0.80 (Like)
P	0.000[*]	0.02[*]	0.002[*]	0.052[*]

Description: Numbers followed by different superscript letters (a, b, c, d) indicate a significant difference, [*]Kruskal Wallis Test. The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like).

Commented [I13]:
13. Table 3 - please check the way of writing L, a, b with *

Answer:
Revised. the writing of L, a, and b has been adjusted

Based on the reference "Taufik, Y., Sumartini, & Endriana, W. (2020). Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. Pasundan Food Technology Journal, 6(3), 183–191. https://doi.org/10.23969/pftj.v6i3.2175"

The brightness parameter is represented by the **(L*)** notation, which has a value range of 0 to 100 (black-white) with L as the parameter representing brightness (achromatic color, 0: black to 100: white). The **notation (a*)** denotes a red-green mixed chromatic color (a+ = 0-100 for red, a-= 0-(-80) for green).The outcome for blue-yellow mixture was indicated by the **notation (b*)** value (b+ = 0-70 for yellow, b- = 0 -(-70) for blue)"

Aside from that, the use of the sign (*) to indicate that the data was tested using the One Way Anova Test and the sign (**) to indicate that the data was tested using the Kruskal Wallis Test **has been changed** to be using the superscripts letters ([1]) for the Kruskal Wallis Test and ([2]) for the One Way Anova Test, respectively.

Commented [I14]:
14. . Table 4 - please add what scale was used (points from ..to...)

Answer:
Done. A hedonic test measurement scale has been added.
The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like)
Assuming the average value obtained between 2.65 to 3.30 is in "like"categories

Table 5: The Organoleptic Quality of Pineapple Chillies Containing Soy Milk in Yogurt Application

Treatment	Acceptance (Mean ± SD)			
	Color	**Aroma**	**Taste**	**Texture**
P0	3.18 ± 0.64^{a} (Like)	3.28 ± 0.60^{a} (Like)	3.33 ± 0.66^{a} (Like)	3.31 ± 0.56^{a} (Like)
P1	3.15 ± 0.53^{a} (Like)	$3.20 \pm 0.52^{a,c}$ (Like)	$3.28 \pm 0.75^{a,c}$ (Like)	3.15 ± 0.58^{a} (Like)
P2	2.88 ± 0.61^{b} (Like)	$2.98 \pm 0.53^{b,c}$ (Like)	$3.03 \pm 0.62^{b,c}$ (Like)	3.03 ± 0.70^{a} (Like)
P3	2.55 ± 0.60^{c} (Like)	$2.98 \pm 0.58^{b,c}$ (Like)	2.75 ± 0.74^{b} (Like)	2.70 ± 0.69^{b} (Like)
P	0.000^{*}	0.03^{*}	0.001^{*}	0.007^{*}

Description: Numbers followed by different superscript letters (a, b, c) indicate a significant difference, *Kruskal Wallis Test. The evaluation of the hedonic test was categorized into a scale of 1 to 4 (1= very dislike, 2 = dislike, 3 = like, 4 = very like)

Commented [I15]:
15. table 5 - why there is no information in material and methods that yogurts were prepared? please add it? what was the amount of pinapple chellies added to yougurt ect?

Answer:
Done. More specific explanation about ingredients and methods related to the addition of yogurt has been added in the section method and material.

The reason for applying yogurt to chellies is to see if there is an effect on acceptability when chellies are applied to a food or drink such as yogurt, this is because chellies are generally consumed as toppings.

"The samples to be tested were chellies with various treatments P0 (100%), P1 (75%:25%), P2 (50%:50%), P3 (25%:75%) and chellies that have been applied as a topping on the snack, namely yogurt (Original Cimory Yogurt). The addition of yogurt is used to see if adding chellies to a food or beverage affects its acceptance. 1 tablespoon (5 grams) of yogurt is used as a topping for chellies"

Table 6: The Weighting Score of the Chellies' Contributions to Snack Standard

Treatment	Protein	Score	Fat	Score	Carbohydrate	Score	Antioxidant Activity	Score	Vitamin C	Score	Crude Fiber	Score	Calcium	Score	Organoleptic	Score	Total
P_0 (25%)	1	0.25	1	0.25	4	1	1	0.25	4	1	1	0.25	4	1	4	1	5
P_1 (25%)	2	0.5	2	0.5	3	0.75	2	0.5	3	0.75	3	0.75	1	0.25	3	0.25	4.25
P_2 (25%)	3	0.75	3	0.75	2	0.5	3	0.75	2	0.5	2	0.5	3	0.75	2	0.75	4.75
P_3 (25%)	4	1	4	1	1	0.25	4	1	1	0.25	4	1	2	0.5	1	0.5	55

Implications for Gastronomy

This research relies on human participants. This research started with humans since the ingredients used in this chellies product are safe for human consumption. This study was approved by the ethical clearance with *No.248/VIII/2021/Komisi Bioetik.* Ingredients such as soy milk and pineapple juice are employed as basic ingredients in this chellies product. Furthermore, this study utilized food additives, such as sodium alginate and calcium lactate, as acidity regulators, emulsifiers, thickeners, and stabilizers, all of which are safe and within the suggested usage limits. The combination of sodium alginate and calcium lactate can lead to a spherification process where this process is commonly used in the manufacture of Popping boba/chellies. Chellies are semi-solid gel boba with an inherent liquid, which tends to break immediately during consumption, and does not cause a choking effect. There were no negative side effects because of this research. Based on these, pineapple chellies enriched with soy milk serve as a complementary nutritious snack for children. This inclusion is expected to increase the nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies.

Conflict of Interest

We warrant that there is no conflict of interest with other people or organization that might be construed to influence the results or interpretation of this manuscript.

AUTHORS' STATEMENT

Manuscript title :

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children_____

We hereby declare that we agree to submit this manuscript to Journal of Gastronomy and Food Science and, if accepted, to transfer the copyright of this article to this bulletin.

We confirm that this manuscript is original without fabrication and plagiarism. It has not been previously published or is being submitted for publication elsewhere.

We warrant that there is no conflict of interest with other people or organization that might be construed to influence the results or interpretation of this manuscript.

We confirm that each listed authors has made a substantial contribution to the manuscript and ensure nobody who qualifies for authorship has been excluded. Main Contributor is marked by an asterisk (*)

Diana Nur Afifah*_____Signature _____

Amy Febriani Hartono _____Signature _____

Ayu Tri Astuti _____Signature _____

Salmaa Novian Susilo Putri _____Signature _____

Enny Probosari _____Signature _____

Gemala Anjani _____Signature _____

Muflihatul Muniroh_____Signature_____

Nuryanto Nuryanto _____Signature_____

Aryu Candra _____Signature_____

Confirming submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 15 June 2022 at 19:24
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

This is an automated message.

Manuscript Number: IJGFS-D-22-00128R1

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

We have received the above referenced manuscript you submitted to International Journal of Gastronomy and Food Science.

To track the status of your manuscript, please log in as an author at https://www.editorialmanager.com/ijgfs/, and navigate to the "Revisions Being Processed" folder.

Thank you for submitting your revision to this journal.

Kind regards,
International Journal of Gastronomy and Food Science

More information and support

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ijgfs/login.asp?a=r). Please contact the publication office if you have any questions.

Confirming handling editor for submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 15 June 2022 at 23:57
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

This is an automated message.

Manuscript Number: IJGFS-D-22-00128R1

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

The above referenced manuscript will be handled by Editor-in-Chief Dr Juan-Carlos Arboleya .

To track the status of your manuscript, please log into Editorial Manager at https://www.editorialmanager.com/ijgfs/.

Thank you for submitting your work to this journal.

Kind regards,

International Journal of Gastronomy and Food Science

More information and support

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ijgfs/login.asp?a=r). Please contact the publication office if you have any questions.

Track the status of your submission to International Journal of Gastronomy and Food Science

1 message

Submission Tracker <no-reply@submissions.elsevier.com> 19 June 2022 at 12:17
To: d.nurafifah.dna@fk.undip.ac.id

Manuscript Number: IJGFS-D-22-00128
Manuscript Title: The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children
Journal: International Journal of Gastronomy and Food Science

Dear Diana Nur Afifah,

Your submitted manuscript is currently under review. The peer review process can take a while, so we are trying out a new service that allows you to track the peer review status of your submission in more detail. You can access the service here: https://track.authorhub.elsevier.com?uuid=330db9a1-362a-4fd0-aba0-2d255d11afc5

This page will remain active until the peer review process for your submission is completed. You can visit the page whenever you like to check the progress of your submission. The page does not require a login, so you can also share the link with your co-authors.

We hope you find this service useful.

Kind regards,
Journal Office of International Journal of Gastronomy and Food Science
Elsevier B.V.

Please note this is an automated message and will only be sent once.
For more information and support, please visit https://service.elsevier.com/app/answers/detail/a_id/5971/supporthub/publishing/

Decision on submission to International Journal of Gastronomy and Food Science

1 message

International Journal of Gastronomy and Food Science <em@editorialmanager.com> 22 July 2022 at 01:39
Reply-To: International Journal of Gastronomy and Food Science <support@elsevier.com>
To: Diana Nur Afifah <d.nurafifah.dna@fk.undip.ac.id>

Manuscript Number: IJGFS-D-22-00128R1

The Addition Of Soy Milk To Pineapple Chellies As A Complementary Alternative To Nutritious Snacks For Children

Dear Dr Afifah,

Thank you for submitting your manuscript to International Journal of Gastronomy and Food Science.

I am pleased to inform you that your manuscript has been accepted for publication.

My comments, and any reviewer comments, are below.
Your accepted manuscript will now be transferred to our production department. We will create a proof which you will be asked to check, and you will also be asked to complete a number of online forms required for publication. If we need additional information from you during the production process, we will contact you directly.

We appreciate you submitting your manuscript to International Journal of Gastronomy and Food Science and hope you will consider us again for future submissions.

Kind regards,
Juan-Carlos Arboleya, PhD
Editor-in-Chief

International Journal of Gastronomy and Food Science

Editor and Reviewer comments:

Reviewer #1: the article in present form can be accepted for publication.

More information and support

FAQ: When and how will I receive the proofs of my article?
https://service.elsevier.com/app/answers/detail/a_id/6007/p/10592/supporthub/publishing/related/

You will find information relevant for you as an author on Elsevier's Author Hub: https://www.elsevier.com/authors

FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/
Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email

#AU_IJGFS#

To ensure this email reaches the intended recipient, please do not delete the above code

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ijgfs/login.asp?a=r). Please contact the publication office if you have any questions.

Mail FK UNDIP

diana nurafifah <d.nurafifah.dna@fk.undip.ac.id>

Proofs of [IJGFS_100571]

1 message

corrections.esch@elsevier.tnq.co.in <corrections.esch@elsevier.tnq.co.in> 3 August 2022 at 15:24
To: d.nurafifah.dna@fk.undip.ac.id

PLEASE DO NOT ALTER THE SUBJECT LINE OF THIS E-MAIL ON REPLY

Dear Dr Diana Nur Afifah,

Thank you for publishing with International Journal of Gastronomy and Food Science. We are pleased to inform you that the proof for your upcoming publication is ready for review via the link below. You will find instructions on the start page on how to make corrections directly on-screen or through PDF.

https://elsevier.proofcentral.com/en-us/landing-page.html?token=884cc0fo2z3c660b67011ab2902363

Please open this hyperlink using one of the following browser versions:

- Google Chrome 50+
- Mozilla Firefox 45+
- Mac OS Safari 10+

We ask you to check that you are satisfied with the accuracy of the copy-editing, and with the completeness and correctness of the text, tables and figures. To assist you with this, copy-editing changes have been highlighted.

You can save and return to your article at any time during the correction process. Once you make corrections and hit the SUBMIT button you can no longer make further corrections.

We will do everything possible to get your article published quickly and accurately. The sooner we hear from you, the sooner your corrected article will be published online. You can expect your corrected proof to appear online within a week after we receive your corrections.

We very much look forward to your response.

Yours sincerely,

Elsevier

E-mail: corrections.esch@elsevier.tnq.co.in

For further assistance, please visit our customer support site at https://service.elsevier.com. Here you can search for solutions on a range of topics. You will also find our 24/7 support contact details should you need any further assistance from one of our customer support representatives.

The addition of soy milk to pineapple chellies as a complementary alternative to nutritious snacks for children

The corrections made in this section will be reviewed and approved by a journal production editor.

Diana Nur Afifah[a,*], d.nurafifah.dna@fk.undip.ac.id, Amy Febriani Hartono[a], Ayu Tri Astuti[a], Salmaa Novian Susilo Putri[a], Enny Probosari[a], Gemala Anjani[a], Muflihatul Muniroh[b], Nuryanto[a], Aryu Candra[a]

[a]Department of Nutrition Science, Faculty of Medicine, Diponegoro University, Semarang, Java, 50275, Indonesia

[b]Department of Physiology, Faculty of Medicine, Diponegoro University, Semarang, Java, 50275, Indonesia

*Corresponding author.

Abstract

One of the strategies adopted to introduce fruits to youngsters is achieved by delivering pineapple chellies containing soy milk. This study, therefore, aims to determine the differences in nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies with the addition of suitable soy milk as a complementary alternative to children's nutritious snacks. Based on the weights and considerations, P_3 was selected as the best formulation, in terms of the nutrient content and contribution level of the chellies with adequate snack standards.

Keywords:

nutrient Content, Antioxidants, Physical properties, Organoleptic quality, Chellies, Snacks

Abbreviations

No keyword abbreviations are available

1 Introduction

School-age children between 7 ~~and~~ - 12 years commonly experience rapid growth and development. (~~NuryantoPramono et al., 2014~~Nuryanto et al., 2014). The 2018 Basic Health Research showed the behavior of the population aged ≥5 years with less fruit consumption rate at 95.5% (Ministry of Health Republic of Indonesia, 2018). This infrequent fruit intake possibly increases the risk of experiencing nutritional deficiencies, in terms of vitamins, minerals and fiber as well as disrupts the body's acid-base balance. ~~According to Sousa et al. (2022),~~ The street food purchases studied were found to be energy-dense, with high amounts of saturated fat, trans-fat, and sodium, as well as low potassium content, all of which ~~can have~~ could had a negative effect on health over time (Sousa et al., 2022).

Acceptable children snack is expected to contain 20% of the daily energy adequacy rate with a ratio of 10–20% carbohydrates, 2–4% protein, and 4–6% fat or at least 300 kcal of energy, 5 g of protein, 8.3 g of fat and 45 g of carbohydrate~~s~~ for 100 g of snacks. There is also the need for micronutrients of approximately 27 mg of vitamin C, 7.2 g of crude fiber, and 330 mg of calcium in 100 g of snacks (National Agency for Drug and Food Control of Indonesia, 2016; Wiraningrum et al., 2015).

Pineapple chellies further serve as a preferred alternative snack in enhancing school children's interest, specifically in fruits. Chellies are semi-solid gel boba with an inherent liquid, which tends to break immediately during consumption, and does not cause a choking effect (Slobodan et al., 2011). However, pineapple chellies appear incapable of fulfilling the minimum nutritional recommendations for an adequate snack. This circumstance necessitates the need to introduce other ingredients, including soy milk (Wiraningrum et al., 2015). Dairy products of nuts are suitable alternatives for school children, due to the affordability, sufficient calcium, and the absence of a fishy smell. Calcium is very critical for the growth of children's bones and teeth (Pravina et al., 2015).

Based on this background, pineapple chellies enriched with soy milk serve as a complementary nutritious snack for children. This inclusion ~~is~~ was expected to increase the nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies. Therefore, it ~~is~~ was necessary to analyze these characteristics of pineapple chellies with added soy milk as a complementary alternative to nutritious snacks.

2 Method

This study ~~is~~ was categorized under food technology science based on a two-factor completely randomized experimental design. The raw materials consist of honey pineapple and soy milk.

2.1 Soy milk making

The soy milk was formulated at the Food Laboratory, Department of Nutrition Science, Faculty of Medicine, Diponegoro University. The raw materials for making soy milk ~~are~~ were 250 g of soybeans, 1250 ml of water, sugar 0,7%, and NaHCO3 or baking soda 0,5%. Several processes in its production include sorting, soaking, epidermis removal, boiling, grinding, filtration and heating. First, the impurities and damaged seeds were eradicated and the soybeans were then blanched/soaked with 0.5% NaHCO3 or baking soda for 15 min with water at 80 °C (soybean ratio of 3:1). This was followed by draining, washing, and peeling to separate the epidermis. The boiling process lasted for 30 min ~~minutes~~ at 80 °C with water (soybean ratio of 5:1). These samples were then blended with water for 5 min ~~minutes~~ (soybean ratio of 5:1) and the

mashed soybeans were filtered with a filter cloth, followed by the addition of 7% sugar. The filtrate ~~is~~ was then heated to 80°C and then boiled for 30 min at low heat until cooked. The amount of soy milk obtained in 250 g ~~is~~ was 1500 ml. The soy milk that will be tested ~~is~~ was made on the same day. Soy milk was stored at 4 °C in a chiller (Usydus et al., 2009; Yuliani, 2017).

2.2 Chellies making

The chellies were produced at the Food Laboratory, Department of Nutrition Science, Faculty of Medicine, Diponegoro University. First, a 2% solution of sodium alginate was formulated with 1 L of water. This liquid served as a medium for the formation of chellies spherification. Sodium alginate is a polymer generated from algae or brown seaweed that develops in cold environments. Sodium alginate is used as a thickener, stabilizer, gelling agent, and emulsifier in the food business (Szekalska et al., 2016). The honey pineapples ~~is~~ were washed and sliced before being mashed (mixed) with soy milk and 2% calcium lactate. Spherification (formation of chellies balls) occurred in the sodium alginate solution by dripping the juice mixture, followed by rinsing with water (Sen, 2017). Chellies ~~have~~ had a diameter ranging from 8 to 9 mm. Each chellies weighs approximately 5 g. Chellies ~~are~~ were only made when an analysis ~~is~~ was to be carried out. Chellies were kept in plastic cup containers with plastic cup lids in the freezer at −19°C, labeled according to the treatment groups.

2.3 Proximate analysis test

The protein content was determined using the Kjeldahl method (AOAC, 2005). The fat content was determined using the Soxhlet method (AOAC, 2005). The water content was determined by gravimetric method. The ash content was determined using the dry ashing method (AOAC, 2005). The carbohydrate content was analyzed by difference, where its composition was calculated by subtracting 100% of the nutrient content from the water, ash, protein, and fat components (Apriani et al., 2011). This research was conducted with 4 treatments and 3 replications to obtain 12 experimental units for water content, ash content, protein, fat and carbohydrates.

2.4 Antioxidant activity test

The antioxidant activity test for chellies was using the DPPH method (Sami and Rahimah, 2016). Sample~~s~~ of 0.01 g ~~were~~ was added with 10 ml of methanol, and then vortexed until homogeneous state. 1000 ppm of the sample solution ~~were~~ was pipetted up to 400 µL (80 ppm), 500 µL (100 ppm), 600 µL (120 ppm), 700 µL (140 ppm), and 800 µL (160 ppm), respectively. Absolute methanol of 5 ml was also added and vortexed until a homogeneous state. Approximately, 1 ml of DPPH solution was then introduced and vortexed until homogeneous before cooling for 30 min ~~minutes~~. The resulting samples were subsequently measured spectrophotometrically with a wavelength of 517 nm using a UV−Vis spectrophotometer.

2.5 Vitamin C test

The vitamin C test was performed in duplicate using the iodimetry method (Sulaeman et al., 1993). First, about 200−300 g of the sample ~~were~~ was weighed and blended until smooth. 25 g of the sample solution was introduced to 75 ml of distilled water and agitated vigorously, before being centrifuged or filtered. The filtrate was subsequently placed in a 100 ml volumetric flask where distilled water was added to a volume limit of 100 ml. This was followed by measuring 25 ml of the filtrate from the previous stage with the addition of 75 ml of distilled water and 25 ml of $H_2SO_4$2N solution before titrating with 0.1000 N standard solution of iodine, using starch solution as an indicator. Equivalence value: each mL of 0.1000 N iodine solution is equivalent to 8.8 mg of vitamin C.

2.6 Crude fiber test

Analysis of crude fiber content according to Sudarmadji (Sudarmadji et al., 1997). First, the sample was crushed and weighed up to 2 g, followed by the fat extraction process, using the Soxhlet method. The resulting portion was then transferred to a 600 ml Erlenmeyer before the addition of 0.5 g of ignited asbestos and three drops of ~~an~~ anti-foam agent. About 200 ml of hot 1.25% H_2SO_4 ~~were~~ was also introduced and covered with reverse cooling before boiling for 30 min ~~minutes~~ with occasional shak~~ing~~ed and then filtered.

Subsequently, the Erlenmeyer residue was washed with boiling water until no acidity was observed after testing with litmus paper. This sample was then transferred quantitatively from the filter paper back into the Erlenmeyer using a spatula. The side was washed again with 200 ml of boiling 1.25% NaOH solution until all the residue was obtained. Furthermore, the content was simmered on reverse cooling for 30 min ~~minutes~~ and stirred occasionally. This was followed by additional filtering using a filter paper with a known weight or a gooch crucible ignited while washing with 10% K_2SO_4 solution. The resulting sample was again rinsed with boiling water and about 15 ml of 95% alcohol. Meanwhile, the filter paper or crucible with its contents ~~was~~ were oven-dried at 110°C to constant weight for 1−2 h ~~hours~~ and cooled in a desiccator before weighing. It ~~is~~ was also important to reduce the weight of asbestos during usage.

2.7 Calcium test

The calcium test was implemented at the Chemistry Laboratory, Semarang University, where the material was first destroyed by dry ashing. Subsequently, 20−100 ml of the dry ash solution was pipetted and placed in a 250 ml beaker before adding 25−50 ml of distilled water. About 10 ml of saturated ammonium oxalate solution and 2 drops of the metal red indicator were also introduced. The solution was prepared slightly alkaline by adding dilute ammonia and slightly acidic with minimal drops of acetic acid until a pink coloration was observed (pH 5.0). The sample was then heated two boiling and cooled for a minimum of 4 h ~~hours~~ at room temperature, before filtering with Whatman filter paper no. 42 and rinsed with hot distilled water until the filtrate was free of oxalate. The filtrate from the last filter should be Cl-free by testing with AgNO3 if HCl was used in preparing the ash solution. Furthermore, the end of the filter paper was perforated with a glass rod, and the filtrate was rinsed before being transferred to the beaker containing calcium with hot dilute H2SO4. The filtrate was then rinsed with hot water at 70−80°C before titrating with 0.01 N KMnO4 until the first persistent pink solution was obtained. The filter paper was added next, and the titration was repeated until the second persistent pink hue was achieved (Sumantri, 2010).

2.8 Color test

The color test on chellies was conducted in 3 repetitions at the Diponegoro University Integrated Laboratory, using a digital colorimeter (CS-10 Colorimeter). First, the samples were placed into the line of the paper box before pressing the IChat program, video, and video preview. The cursor was then directed to the four sides of the video preview, while the analysis results were shown on the display unit.

Also, the measurement produced L, a, and b values. The brightness parameter is represented by the L* notation, which has a value range of 0−100 (black-white). The notation a* denotes a red-green mixed chromatic color (a+ = 0−100 for red, a- = 0-(-80) for green), while the outcome for blue-yellow mixture was indicated by the notation b* value (b+ = 0−70 for yellow, b- = 0-(-70) for blue) (Taufik et al., 2020).

2.9 Hardness and elasticity test

The hardness and elasticity tests were both performed with the Brookfield CT3 texture analyzer at the Diponegoro University Integrated Laboratory (Kusnadi et al., 2012). The needle (probe) was installed and positioned until it was close to the sample. This type consists of a cylindrical probe with a diameter of 1 cm and speed of 1.0 mm/s, while the trigger was set in a 3-mile formation. The sample was placed on the sample testing then the probe moved downwards which was driven by a load cell to press the sample and then returned to the top. Subsequently, the value of the analysis results was shown on the display unit. TPA curves were analyzed for both the hardness and

elasticity tests. The hardness value refers to the amount of compressive force in suppressing the solid products as indicated by the absolute (+) peak, which ~~is~~ was the maximum force with units of gram force (gf) while the elasticity value was measured in millimeters (mm). Furthermore, the test was performed with 3 repetitions.

2.10 Chellies acceptance rate analysis

The organoleptic quality test involved asking 40 untrained panelists. The samples to be tested were chellies with various treatments P0 (100%), P1 (75%:25%), P2 (50%:50%), P3 (25%:75%) chellies that ~~have~~ had been applied as a topping on the snack, namely yogurt (Original Cimory Yogurt). The addition of yogurt ~~is~~ was used to see if adding chellies to a food or beverage affecteds~~s~~ its acceptance. 1 tablespoon (5 g) of yogurt ~~is~~ was used as a topping for chellies. Panelists were asked to assess how much they liked the color, taste, and aroma of Chellies products. The evaluation of the hedonic test was categorized into ascale of 1–4 (1 = very dislike, 2 = dislike, 3 = like, 4 = very like) (Mareta, 2019).

2.11 Best formulation analysis

The best formulation was selected using a weighting technique on the test results for macronutrient content and antioxidant activity of the chellies. Initial weighting was performed based on the aspect of the chellies' contribution to the snack standard, while the value specified for 25% for each treatment was in accordance with the parameter analyzed. Furthermore, each formula was measured according to the test, and the highest value was specified as the maximum score.

2.12 Data analysis

The data analysis process was conducted using the statistics Software program and its normality was tested with Saphiro-Wilk because the number of samples occurred below 50. The protein content, crude fiber, physical properties of hardness, elasticity, and an acceptance rate of the pineapple chellies were also examined using Kruskal Wallis followed by the Mann Whitney test. Meanwhile, the water content, ash, fat, carbohydrate, vitamin C, calcium, antioxidant activity, IC50 value, and the color properties of the pineapple Chellies were evaluated using ANOVA (Analysis of Variance), followed by the Bonferroni post hoc test the occurrence of a variation. The results showed that the effect of the independent variable on the dependent variable was considered significant with the p-value ≤ 0.05.

3 Result and discussion

3.1 The nutrient content of pineapple chellies containing soy milk

The protein, fat, water content, ash content and carbohydrate content of chellies ranged from 0.49 to 4.80%; 0.19–1.03%; 5.63–6.07%; 0.16–0.27; 87.28–93.50% (Table 1). ~~.~~ showeds~~s~~ the results of the proximate analysis of Chellies. The rise in the chellies' protein content with an increase in the soy milk content ~~is~~ was influenced by the composition of soy milk. Soybeans containeed complete essential amino acids which help to maintain the balance of the body's metabolism. Processed soybeans also containeed easier digestible proteins (Santosa and Suliana, 2009).

alt-text: Table 1

Table 1

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The results of the proximate analysis of chellies.

Nutrient content (%)	P0	P1	P2	P3
Protein [1]	0.49 ± 000^{a}	1.37 ± 0.02^{b}	3.02 ± 0.02^{c}	4.80 ± 0.04^{d}
Fat [2]	0.19 ± 0.00^{a}	0.63 ± 0.00^{b}	0.73 ± 0.00^{c}	1.03 ± 0.03^{d}
Water content [2]	5.63 ± 0.03^{a}	5.77 ± 0.03^{b}	5.92 ± 0.03^{c}	6.07 ± 0.04^{d}
Ash content [2]	0.16 ± 0.00^{a}	0.19 ± 0.01^{b}	0.21 ± 0.00^{c}	0.27 ± 0.02^{d}
Carbohydrate [2]	93.50 ± 0.0^{a}	92.02 ± 0.06^{b}	90.09 ± 0.06^{c}	87.82 ± 0.11^{d}
Crude Fiber [1]	2.09 ± 0.01^{a}	3.75 ± 0.22^{b}	4.13 ± 0.38^{c}	4.24 ± 0.39^{d}
Vitamin C [2]	6.63 ± 0.40^{a}	5.46 ± 0.50^{b}	4.36 ± 0.32^{c}	3.43 ± 0.32^{d}
Calcium [2]	4.02 ± 0.50^{a}	4.38 ± 0.39^{a}	4.84 ± 0.32^{a}	4.91 ± 0.43^{a}

Description: Numbers followed by different superscript letters (a, b, c, d) indicate significant differences, [1]Kruskal-Wallis test; [2]One Way Anova test. n = 12 (4 experiments × 3 replications) for proximate analysis.

The rise in the chellies' fat content with an increase in the soy milk content ~~is~~ was influenced by the composition of soy milk. This ~~is~~ was attributed to the higher fat content, compared to pineapple. Honey pineapple contains 0.12 g/100 g of fat, while soy milk contains 2.03 g/100 g. According to a previous study, the total fat content of a food sample depends on the fat content of the food ingredients as well as other ingredients added to the food (Setiyono, 2008). Honey pineapple ~~is~~ was composed of 86% water and this water content decreases after processing into chellies. Furthermore, the use of sodium alginate and calcium lactate in the production of pineapple chellies also influences the water content. According to previous studies, sodium alginate hads~~s~~ an excellent water-absorbing ability, while calcium lactate resulteds~~s~~ in lower water content and ~~is~~ was significantly different in Sukade products (Ratnasari et al., 2012; Wardani et al., 2009).

The ash content of the chellies increased with the addition of soy milk because soy milk hads~~s~~ a higher ash content (0.53%), compared to honey pineapple (0.22%). In addition, the carbohydrate content of chellies in all treatment groups reduced with an increase in the content of soy milk because the addition of soy milk tends to increase the water content of the chellies, consequently, decreaseding~~ing~~ the carbohydrate content of the remaining mass.

According to the ALG (Nutrition Label Reference), the crude fiber content of processed food is 6 g (National Agency for Drug and Food Control of Indonesia, 2016). Therefore, processed food containing at least 3.6 g/100 g are believed to be a source of crude fiber, while those greater than 7.2 g/100 g are assumed to be rich in fiber. The crude fiber content of the chellies increased with an increase in the soy milk content because soy milk contains a polysaccharide group consisting of arabinogalactan and water-insoluble cellulose materials (Nilasari et al., 2017).

The highest vitamin C content of 6.63 mg/100 g was recorded for treatment P0. Based on the ALG regulations (Nutrition Label Reference), processed food is believed to be a source of vitamin C, particularly in cases where the material is characterized by at least 15% of solid form or 7.5% in the liquid state. The ALG stipulated vitamin C

content of processed food is 90 mg (National Agency for Drug and Food Control of Indonesia, 2016), thus, processed food containing at least 13.5 mg/100 g is believed to be a source of vitamin C, while those with 27 mg/100 g or more ~~are~~ were assumed to be enriched.

In this study, the reduction in the vitamin C content occurred due to the vitamin's labile nature. Vitamin C ~~is~~ was easily damaged by exposure to light, high temperatures, the presence of oxygen, and processing (Putri and Setiawati, 2015; Razak et al., 2012). The peeling of pineapples caused~~s~~ the meeting of polyphenol oxidase (PPO) with phenolic components to experience enzymatic browning, producing a brown color. This process had~~s~~ the capacity to a reduction of up to 41.8% in vitamin C content (Putri and Setiawati, 2015). Recent research ~~by Huarte et al. (2021)~~ showed~~s~~ that several thermolabile antioxidants, like vitamins, ~~can~~ could be degraded during culinary processes (Huarte et al., 2021).

The highest calcium content of 491 mg/100 g was recorded for treatment P3 (25% honey pineapple and 75% soy milk), which ~~is~~ was classified as high-calcium food. These processed food ~~are~~ were said to be a good source, particularly in cases where the sample contained~~s~~ at least 15% of the ALG requirement in solid form or 7.5% in liquid state. According to the ALG regulations, the calcium content of processed food is 1100 mg (Sami and Rahimah, 2016). Hence, samples with at least 165 mg/100 g ~~are~~ were classified as a good source, while those greater than 330 mg/100 g ~~are~~ were considered to be enriched. The process of dropped~~ing~~ gel chellies in a bath containing sodium alginate creates bond interactions between alginate and calcium where cross-links occured to formed chelate bonds (Sa et al., 2019; Tsai et al., 2017). Alginate which ~~is~~ was soluble in water formed~~s~~ a gel in an acidic solution due to the presence of calcium, therefore, the addition of calcium lactate as a coagulant ~~is~~ was bound to increase the calcium content.

3.2 Antioxidant activity

The antioxidant activity of the chellies increased with an increase in the soy milk content, with the highest and least values being 34.99% and 17.28%, respectively (Table 2 ~~.~~ showed~~s~~ the results of Antioxidant Activity. The IC50 values of chellies in all treatment groups ~~are~~ were classified as very weak antioxidants because the sample tested ~~is~~ was in the form of crude extract, which ~~is~~ was assumed to contain other compounds, for instance, salt, minerals, and other nutrients with the ability to inhibit the antioxidant activity (Wikanta et al., 2005).

alt-text: Table 2

Table 2

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The antioxidant activity of pineapple chellies containing soy milk.

Treatment	Antioxidant Activity (%)	IC50 (ppm)
P_0 (Control)	17.28 ± 0.93*	16915.83 ± 58.97
P_1 (75% honey pineapple and 25% soy milk)	20.05 ± 0.56*	14203.84 ± 4176.10
P_2 (50% honey pineapple and 50% soy milk)	27.83 ± 0.51*	12617.25 ± 180.51
P_3 (25% honey pineapple and 75% soy milk)	34.99 ± 0.73*	10106.54 ± 2800.81
	$p < 0.001$ [a]	$p = 0.056$ [a]

Description: the sign (*) indicated~~s~~ a significant difference in the mean values. [a] = One Way Anova Test.

Another factor responsible for the chellies' weak antioxidant activities ~~is~~ was that the flavonoids in soy milk ~~may~~ might still be glycosides, which ~~are~~ were known to reduced antioxidant activity (Zaheer and Akhtar, 2017). Unfermented processed soybeans, including soy milk, ~~have~~ had a 99% composition of isoflavones in the form of glycosides were conjugated by binding to one sugar molecule. Furthermore, pineapple ~~has~~ had an IC50 value of 1549.88 ppm which ~~is~~ was classified as a very weak antioxidant.

3.3 Hardness, elasticity and color of pineapple chellies containing soy milk

The differences in the hardness of each treatment ~~are~~ were influenced by the thickness of the gel layer composed~~ing~~ the chellies (Bubin et al., 2019). ~~(~~Table 3~~)~~ showed~~s~~ the results physical properties of pineapple chellies containing soy milk. In this study, pineapples were produced through reverse spherification, a technique where pineapple juice, honey, and soy milk ~~are~~ were mixed with calcium lactate and then were dripped into a bath filled with sodium alginate liquid. However, this technique ~~is~~ was limited because the main ingredients (honey pineapple liquid and soy milk) must ~~have~~ had high density with the consistency of heavy cream to penetrate the sodium alginate solution which also ~~has~~ had a high density, and obtained a good chellies shape (Sen, 2017).

alt-text: Table 3

Table 3

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The Physical Properties of Pineapple Chellies containing Soy Milk.

Physical Properties		P0	P1	P2	P3
Hardness [1]		40.17 ± 3.04 [a]	36.92 ± 5.49 [a]	34.83 ± 12.56 [a,c]	29.92 ± 1.86 [b,c]
Elasticity [1]		2.10 ± 0.10 [a]	2.13 ± 0.21 [a]	2.23 ± 0.06 [a]	2.33 ± 0.06 [a]
Color	(L*) [2]	60.43 ± 6.68 [a]	64.66 ± 5.71 [a]	61.98 ± 2.75 [a]	52.80 ± 0.9 [a]
	(a*) [1]	−5.71 ± 1.37 [a]	−6.27 ± 1.19 [a]	−7.16 ± 0.56 [a]	−5.70 ± 0.52 [a]
	(b*) [2]	43.84 ± 7.49 [a]	43.62 ± 5.62 [a]	33.65 ± 0.96 [a]	17.44 ± 0.77 [b]

Description: Numbers followed by different superscript letters (a, b, c) indicated significant differences, [1] Kruskal-Wallis test; [2] One Way Anova test.

An increase in the content of soy milk ~~is~~ was bound to reduce to lighten the consistency of chellies, thereby reduced~~ing~~ the hardness of the chellies membrane layer. Similarly, the elasticity ~~is~~ was affected by the thickness of the gel layer that formed~~s~~ the chellies, which ~~is~~ was influenced by the consistency of the main ingredients. The L* value obtained in this study indicates that the pineapple chellies generally had~~ve~~ a fairly bright color. However, an increase in the soy milk content tends to reduce this brightness, causing the chellies to become pale yellow. These results ~~are~~ were in line with a previous study on the ~~manufacture~~ production of yogurt with soy milk, where the color brightness decreased with the addition of soy milk (Kazemi et al., 2013).

3.4 Organoleptic quality test of pineapple chellies containing soy milk

The addition of soy milk resulted in pale-colored chellies, which the panelists did not like. ~~(~~Table 4~~).~~ showed~~s~~ the results organoleptic quality of pineapple chellies containing soy milk. This ~~is~~ was in line with a previous study on ice cream production where the addition of soy milk resulted in a darkened and pale color (Kusumastuti and Adriani, 2017). The presence of riboflavin in soybeans ~~is~~ was responsible for the yellowish color of soy milk (Handayani and Wulandari, 2016).

alt-text: Table 4

Table 4

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The organoleptic quality of pineapple chellies containing soy milk.

Treatment	Acceptance (Mean ± SD)			
	Color	Aroma	Taste	Texture
P0	3.15 ± 0.53^{a} (Like)	3.30 ± 0.56^{a} (Like)	3.10 ± 0.78^{a} (Like)	2.88 ± 0.72 (Like)
P1	$3.25 \pm 0.49^{a,c}$ (Like)	$3.05 \pm 0.64^{a,c,d}$ (Like)	3.05 ± 0.75^{a} (Like)	3.08 ± 0.73 (Like)
P2	$3.03 \pm 0.48^{a,d}$ (Like)	$2.93 \pm 0.62^{b,c}$ (Like)	2.65 ± 0.74^{b} (Like)	3.00 ± 0.78 (Like)
P3	2.58 ± 0.71^{b} (Like)	$2.85 \pm 0.80^{b,d}$ (Like)	2.58 ± 0.81^{b} (Like)	2.65 ± 0.80 (Like)
P	0.000*	0.02*	0.002*	0.052*

Description: Numbers followed by different superscript letters (a, b, c, d) indicated a significant difference, *Kruskal Wallis Test. The evaluation of the hedonic test was categorized into a scale of 1–4 (1 = very dislike, 2 = dislike, 3 = like, 4 = very like).

Furthermore, the preferred taste of chellies ~~is~~ was the typical sweet, slightly sour, and fresh taste of pineapple (Kumar et al., 2016). The distinctive and fresh pineapple aroma was preferred by the panelists who disclosed that the addition of soy milk resulted in an unpleasant soy aroma (Endrasari and Nugraheni, 2012). This aroma ~~is~~was caused by the presence of volatile carbonyl groups such as n-hexanal, which resulted~~s~~ from the oxidation of unsaturated fatty acids in soybean seeds due to the lipoxygenase enzyme's activity (Nizori et al., 2008).

The texture of the chellies ~~is~~ was influenced by the production technique used and the thickness of the main ingredients (Sen, 2017). Certain panelists disliked the texture of P3 chellies because the chellies were too light because of the thin gel layer, resulting in a poor breaking sensation. This result ~~is~~ was not in line with the theory previously described in the analysis of hardness and elasticity, where a good breaking sensation (breaks easily) due to a thin gel layer, was most preferred. However, P3 was chosen as the best formulation based on the weighted scores and factors in Table 6 because its nutrient content and degree of contribution met the parameters for a high-quality snack.

3.5 Organoleptic quality test of pineapple chellies with the addition of soy milk applied to yogurt

The results showed the addition of soy milk had a significant effect on the color, aroma, taste, and texture parameters of chellies applied to yogurt. ~~(~~Table 5~~).~~ showed~~s~~ the results organoleptic quality of pineapple chellies with the addition of soy milk applied to yogurt. The bright yellow color of P0 chellies ~~is~~ was quite a contrast to the white color of yogurt, therefore, this treatment was considered more attractive by the panelists, compared to the colors of other treatments which became paler with an increase in the soy milk content (Handayani and Wulandari, 2016)~~ (see Table 6)~~.

Q3

alt-text: Table 5

Table 5

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The organoleptic quality of pineapple chillies containing soy milk in yogurt application.

Treatment	Acceptance (Mean ± SD)			
	Color	Aroma	Taste	Texture
P0	3.18 ± 0.64^{a} (Like)	3.28 ± 0.60^{a} (Like)	3.33 ± 0.66^{a} (Like)	3.31 ± 0.56^{a} (Like)
P1	3.15 ± 0.53^{a} (Like)	$3.20 \pm 0.52^{a,c}$ (Like)	$3.28 \pm 0.75^{a,c}$ (Like)	3.15 ± 0.58^{a} (Like)
P2	2.88 ± 0.61^{b} (Like)	$2.98 \pm 0.53^{b,c}$ (Like)	$3.03 \pm 0.62^{b,c}$ (Like)	3.03 ± 0.70^{a} (Like)
P3	2.55 ± 0.60^{c} (Like)	$2.98 \pm 0.58^{b,c}$ (Like)	2.75 ± 0.74^{b} (Like)	2.70 ± 0.69^{b} (Like)
P	0.000*	0.03*	0.001*	0.007*

Description: Numbers followed by different superscript letters (a, b, c) indicated a significant difference, *Kruskal Wallis Test. The evaluation of the hedonic test was categorized into a scale of 1–4 (1 = very dislike, 2 = dislike, 3 = like, 4 = very like).

alt-text: Table 6

Table 6

The table layout displayed in this section is not how it will appear in the final version. The representation below is solely purposed for providing corrections to the table. To preview the actual presentation of the table, please view the Proof.

The weighting score of the chellies' contributions to snack standard.

Treatment	Protein	Score	Fat	Score	Carbohydrate	Score	Antioxidant Activity	Score	Vitamin C	Score	Crude Fiber	Score	Calcium	Score	Organoleptic	Score	Total
P_0 (25%)	1	0.25	1	0.25	4	1	1	0.25	4	1	1	0.25	4	1	4	1	5
P_1 (25%)	2	0.5	2	0.5	3	0.75	2	0.5	3	0.75	3	0.75	1	0.25	3	0.25	4.25
P_2 (25%)	3	0.75	3	0.75	2	0.5	3	0.75	2	0.5	2	0.5	3	0.75	2	0.75	4.75
P_3 (25%)	4	1	4	1	1	0.25	4	1	1	0.25	4	1	2	0.5	1	0.5	55

The unpleasant aroma of soy milk caused by the action of the lipoxygenase enzyme in soybeans also influenced the aroma of the chellies (Endrasari and Nugraheni, 2012; Nizori et al., 2008). However, some panelists considered the aroma of yogurt more dominant than the aroma of the chellies.

Several panelists also considered the taste of yogurt more dominant, compared to the chellies. However, the results showed most panelists preferred chellies with little or no soy milk because the distinctive unpleasant taste of soy milk combined with the sour taste of yogurt was disliked by the panelists (Pramono et al., 2011). The panelists' preference for the chellies' texture also decreased with an increase in the soy milk content, because an increase in the soy milk content reduced~~s~~ the thickness of the chellies' membrane layer, making it easier to break when consumed (Sen, 2017). According to the panelists, chellies that break easily cause no contrasting texture between chellies and yogurt, and ~~do~~ did not produce a good breaking sensation upon consumption.

4 Conclusion

This study's findings showed a significant difference in the mean of macronutrient contents, vitamin C content, crude fiber, antioxidant activity, hardness, and color of pineapple chellies, with the addition of soy milk ($p < 0.05$). The addition of soy milk in the manufacture of pineapple chellies ~~can~~ could increase protein, fat, calcium, and antioxidant activity while lowering carbohydrate, vitamin C, and the acceptability of pineapple skin (color, taste, aroma, and texture) when eaten with and without yogurt. Based on the weighting scores and considerations, P3 was selected as the best formulation, because the nutrient content and contribution level of this treatment ~~are~~ was of good snack standards.

Q4

Funding

~~Directorate of Research and Community Service, Directorate General of Research and Development Strengthening Ministry of Research, Technology and Higher Education of the Republic of Indonesia In accordance with the Agreement on the Assignment of the Implementation of the Community Service Program No: 103-37/UN7.P4.3/PM/2019.~~This study was funded by Directorate of Research and Community Service, Directorate General of Research and Development Strengthening Ministry of Research, Technology and Higher Education of the Republic of Indonesia in accordance with the Agreement on the Assignment of the Implementation of the Community Service Program with grant ID 103-37/UN7.P4.3/PM/2019.

Implications for gastronomy

This research relied~~s~~ on human participants. This research started with humans since the ingredients used in this chellies product ~~are~~ were safe for human consumption. This study was approved by the ethical clearance with *No.248/VIII/2021/Komisi Bioetik.* Ingredients such as soy milk and pineapple juice ~~are~~ were employed as basic ingredients in this chellies product. Furthermore, this study utilized food additives, such as sodium alginate and calcium lactate, as acidity regulators, emulsifiers, thickeners, and stabilizers, all of which ~~are~~ were safe and within the suggested usage limits. The combination of sodium alginate and calcium lactate ~~can~~ could lead to a spherification process where this process ~~is~~ was commonly used in the manufacture of Popping boba/chellies. Chellies ~~are~~ were semi-solid gel boba with an inherent liquid, which tends to break immediately during consumption, and ~~does~~ did not cause a choking effect. There were no negative side effects because of this research. Based on these, pineapple chellies were enriched with soy milk serve as a complementary nutritious snack for children. This inclusion ~~is~~ was expected to increase the nutrient content, antioxidant activity, physical properties, and organoleptic quality of pineapple chellies.

Authors' statement

The Addition of Soy Milk to Pineapple Chellies as A Complementary Alternative to Nutritious Snacks for Children.

We hereby declare that we agree to submit this manuscript to Journal of Gastronomy and Food Science and, if accepted, to transfer the copyright of this article to this bulletin.

We confirm that this manuscript is original without fabrication and plagiarism. It has not been previously published or is being submitted for publication elsewhere.

We warrant that there is no conflict of interest with other people or organization that might be construed to influence the results or interpretation of this manuscript.

We confirm that each listed authors has made a substantial contribution to the manuscript and ensure nobody who qualifies for authorship has been excluded. Main Contributor is marked by an asterisk (*)

Diana Nur Afifah: conceptualization, project administration, resources, writing - review and editing, supervision, validation, Amy Febriani Hartono: data curation, writing - original draft, visualization, methodology, Ayu Tri Astuti: visualization, data curation, writing - original draft, methodology, Salmaa Novian Susilo Putri: methodology, writing - original draft, visualization, data curation, Enny Probosari: formal analysis, writing - review and editing, validation, Gemala Anjani: validation, writing - review and editing, formal analysis, Muflihatul Muniroh: formal analysis, validation, writing - review and editing, Nuryanto Nuryanto: writing - review and editing, formal analysis, validation, Aryu Candra: validation, writing - review and editing, formal analysis.

Declaration of competing interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

References

The corrections made in this section will be reviewed and approved by a journal production editor. The newly added/removed references and its citations will be reordered and rearranged by the production team.

AOAC, 2005. Official Method of Analysis of the Association of Official Analytical of Chemist. The Association of Official Analytical Chemyst, Inc.

Apriani, R., Arpah, M., Setyadjit, 2011. Composite flour formulation of taro flour, mung bean and banana flour in making baked brownies. Sci. J. Food Sci. Res. 2, 1–18.

Bubin, S.F.A., Ali, S.M., Shukri, R., Ibadullah, W.Z.W., Ramli, N.S., Mustapha, N.A., Rashedi, I.F.M., 2019. Characterization and stability of pitaya pearls from hydrocolloids by reverse spherification. Int. J. Food Prop. 22 (1), 1353–1364.

Endrasari, R., Nugraheni, D., 2012. Effect of soymilk with various processing methods for organoleptic acceptability. In: Proceedings of the National Seminar on Yard Optimization, Semarang, vol. 6. pp. 468–475 November.

Handayani, M.N., Wulandari, P., 2016. The effect of adding different types of milk on the characteristics of soyghurt. J. Agric. Ind. Technol. 10 (2), 62. doi:10.21107/agrointek.v10i2.2467.

Huarte, E., Juániz, I., Cid, C., de Peña, M.-P., 2021. Impact of blanching and frying heating rate/time on the antioxidant capacity and (poly)phenols of cardoon stalks (Cynara cardunculus L. var. altilis DC). Int. J. Gastronomy. Food Sci. 26, 100415. doi:10.1016/j.ijgfs.2021.100415.

Kazemi, A., Mazloomi, S.M., Hassanzadeh-Rostami, Z., Akhlaghi, M., 2013. Effect of adding soymilk on physicochemical, microbial, and sensory characteristics of probiotic fermented milk containing Lactobacillus acidophilus. Iran. J. Vet. Res. 15 (3), 206–210.

Kumar, K., Chandra, S., Kumar, V., 2016. Medico-nutritional importance and value added products of pineapple. Review 2 (1), 290–298.

Kusnadi, D., Bintoro, V., Baarri, A.N.A.L., 2012. Water holding capacity, level of elasticity and protein content in meatball combination of beef and rabbit meat. J Appl Food Technol (JAFT) 1 (2), 48. doi:10.21157/j.med.vet..v10i1.4038.

Kusumastuti, S., Adriani, M., 2017. The effect of soymilk substitution and mocaf (modified cassava flour) to the acceptance, fiber content, and product economic value of red dragon ice cream. Amerta Nutr. 252–260. doi:10.20473/amnt.v1.i3.2017.

Mareta, D.T., 2019. Hedonic Test method for measuring instant pindang seasoning powder preferences. J. Sci. Applicative. Technol. 3 (1), 34. doi:10.35472/jsat.v3i1.195.

National Agency for Drug and Food Control of Indonesia, 2016. Nutrition Facts Label.

Nilasari, O.W., Susanto, W.H., Maligan, J.M., 2017. The effect of temperature and length of cooking to pumpkin lempok characteristic. J. Food. Argoindustry 5 (3), 15–26.

Nizori, A., Suwita, V., Surhaini, Mursalin, Melisa, Sunarti, T.C., Warsiki, E., 2008. Making sinbiotic soyghurt as a functional food with the addition of mixed culture Streptococcus thermophillus, Lactobacillus bulgaricus AND Lactobacillus acidophilus. J. Agric. Ind. Technol. 18 (1), 28–33.

Nuryanto, Pramono, A., Puruhita, N., Muis, S.F., 2014. The effect of nutrition education on knowledge and attitude of nutrition among school children. Indones. J. Nutr. 3 (1), 32–36. doi:10.20473/mgi.v12i2.183-190.

Ministry of Health Republic of Indonesia, 2018. Riskesdas 2018 Main Results. p. 1 200.

Pramono, Y., Nurwantoro, Maskuri, Dwiloka, B., 2011. Microbiological, Chemical, Physical, and Organoleptic Characteristics of Yogurt with the Addition of Red Sweet Potato. Faculty of Animal Husbandry, Diponegoro University.

Pravina, P., Sayaji, D., Avinash, M., 2015. Calcium and its role in human body. Int. J. Res. Pharmaceut. Biomed. Sci. 4 (2), 659–666.

Putri, M.P., Setiawati, Y.H., 2015. Analysis levels of vitamin c in fruit fresh pineapple (Ananas comosus (L.) Merr) and fruit canned pineapple with UV- VIS spectrophotometry method. Wiyata J. 2 (1), 34–38.

Ratnasari, L., Ristiarini, S., Endang, T., 2012. Effect of calcium salt types and storage period to succade of endodermis layer of melon (Cucumis melo L). J. Food Technol. Nutr. 11 (2), 9–17.

Razak, A.R., Sumarni, N.K., Rahmat, B., 2012. Optimization of sucrose hydrolysis using sulfonate type cation exchange resin. J. Nat. Sci. 1 (1), 119–131.

Sa, G., Aa, K., Tr, S., 2019. Characterization of flavoured sweet water balls prepared by basic spherification technique. Int. J. Chem. Stud. 7 (1), 1714–1718.

Sami, F.J., Rahimah, S., 2016. Antioxidant activity testing of brocolli (Brassica oleracea L. var. Italica) z DPPH (2.2 diphenyl-1-picrylhydrazyl) and ABTS (2.2 azinobis (3-ethylbenzothiazoline)-6-sulphonic acid) methods. Indones. J. Phytopharmaceuticals. 2 (2), 107–110. doi:10.33096/jffi.v2i2.179.

Santosa, B., Suliana, G., 2009. The Effect of soybean varieties on the quality of tofu produced. J. Sci. World. 9 (2), 137–140. https://jurnal.unitri.ac.id/index.php/buanasains/article/view/233.

Sen, D.J., 2017. Cross linking of calcium ion in alginate produce spherification in molecular gastronomy by pseudoplastic flow. J. Pharmaceut. Sci. 5 (1), 1–10. doi:10.1002/jps.2600800102.

Setiyono, 2008. Restructuring Beef for Health Food: a Study on Rattus Norvegicus L. Graduate School of Gadjah Mada University, Yogyakarta.

Slobodan, I., Mikinac, K., Perman, L., 2011. Molecular gastronomy in function of scientific implementation in practice. J. Econ. 2 (2), 139–150.

Sousa, S., Albuquerque, G., Gelormini, M., Casal, S., Pinho, O., Damasceno, A., Moreira, P., Breda, J., Lunet, N., Padrão, P., 2022. Nutritional content of the street food purchased in Chișinău, Moldova: opportunity for policy action August Int. J. Gastronomy. Food Sci. 27 2021, 0–4 doi:10.1016/j.ijgfs.2021.100456.

Sudarmadji, S., Haryono, B., Suhardi, 1997. Analysis Procedures for Foodstuffs and Agriculture. fourth ed. 4 edition Liberty Yogyakarta.

Sulaeman, A., Anwar, F., Rimbawan, M.S.A., 1993. Method of Analysis of Nutrient Composition of Food. IPB University.

Sumantri, A.R., 2010. Food Analysis. Gadjah Mada University Press, Yogyakarta.

Szekalska, M., Pucilowska, A., Szymanska, E., Ciosek, P., Winnicka, K., 2016. Alginate : current use and future perspectives in pharmaceutical and biomedical applications. Int. J. Polym. Sci. 1–17.

Taufik, Y., Sumartini, Endriana, W., 2020. Comparative study of black mulberry fruit (Morus nigra L.) with water on the characteristics of spreadable processed cheese black mulberry. Pasundan. Food Technol. J. 6 (3), 183–191. doi:10.23969/pftj.v6i3.2175.

Tsai, F.H., Chiang, P.Y., Kitamura, Y., Kokawa, M., Islam, M.Z., 2017. Producing liquid-core hydrogel beads by reverse spherification: effect of secondary gelation on physical properties and release characteristics. Food Hydrocolloids 62 (7), 140–148. doi:10.1016/j.foodhyd.2016.07.002.

Usydus, Z., Richert, J., Adamczyk, M., 2009. Protein quality and amino acid profiles of fish products available in Poland. Food Chem. 112 (1), 139–145.

Wardani, W.D., Kawiji, Manuhara, G.J., 2009. Isolation and characterization of sodium alginate from brown algae Sargassum sp. for making tenggiri (Scomberomorus commerson) meatballs. Biofarmasi 7 (2), 59–67.

Wikanta, T., Januar, H.I., Nursid, M., 2005. Antioxidant activity test, toxicity, and cytotoxicity red algae extract Rhodymenia palmata. Indones. Fish. Res. J. 11 (4), 41. doi:10.15578/jppi.11.4.2005.41-49.

Wiraningrum, E.A., Pudjirahaju, A., Setyobudi, S.I., 2015. Food snacks school children (PJAS), adequate energy and nutrition for elementery school. Indones. J. Health Inf. 1 (1), 25–33.

Yuliani, C., 2017. The effect of soybean types (Glycine max L.) and blanching time on the physico- chemical and sensory evaluation of soymilk powder. J. Agric. Technol. 12 (2), 45–52.

Zaheer, K., Akhtar, H., 2017. An updated review of dietary isoflavones: nutrition, processing, bioavailability and impacts on human health. Crit. Rev. Food Sci. Nutr. 57, 1280–1293.

Highlights

- The addition of soy milk in the ~~manufacture~~ producing of pineapple *chellies* increases the levels of protein, fat, calcium, and antioxidant activity.
- The *chellies* carbohydrate and vitamin C levels decreased as the amount of soy milk added increased.

Q5

- ~~The acceptance of pineapple *chellies* (color, taste, scent, and texture) is affected by the addition of soy milk, both when ingested with and without yogurt, with the panelists' preference level decreasing as the amount of soy milk added increases.~~The acceptance of pineapple chellies decreasing as the amount of soy milk added increases.

Queries and Answers

Q1

Query: Please confirm that the provided **email** "d.nurafifah.dna@fk.undip.ac.id" is the correct address for official communication, else provide an alternate e-mail address to replace the existing one, because private e-mail addresses should not be used in articles as the address for communication.

Answer: Reviewed

Q2

Query: The **citations** 'Nuryanto et al., 2014; Huarte (2021); Sousa (2022)' have been changed to match the author name in the reference list. Please check here and in subsequent occurrences, and correct if necessary.

Answer: Reviewed

Q3

Query: **Table 6** was not cited in the text. Please check that the citation(s) suggested are in the appropriate place, and correct if necessary.

Answer: Done

Q4

Query: Correctly acknowledging the primary **funders and grant IDs** of your research is important to ensure compliance with funder policies. Please make sure that funders are mentioned accordingly.

Answer: Reviewed

Q5

Query: **Highlights** should only consist of 125 characters per bullet point, including spaces. The highlights provided are too long; please edit them to meet the requirement.

Answer: Done

Q6

Query: Please confirm that **given names and surnames** have been identified correctly and are presented in the desired order and please carefully verify the spelling of all authors' names.

Answer: Reviewed

Q7

Query: Your article is registered as a regular item and is being processed for inclusion in a regular issue of the journal. If this is NOT correct and your article belongs to a Special Issue/Collection please contact p.karthik@Elsevier.com immediately prior to returning your corrections.

Answer: Yes

Mail FK UNDIP

diana nurafifah <d.nurafifah.dna@fk.undip.ac.id>

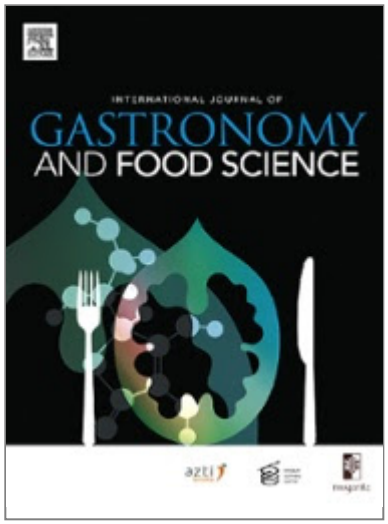
FOR YOUR INFORMATION - Your article (Pre-Proof) is now available online [IJGFS_100571]

1 message

Author Services <Article_Status@elsevier.com> 4 August 2022 at 05:39
To: d.nurafifah.dna@fk.undip.ac.id

ELSEVIER

Your Article Is Now Available Online



Dear Dr Afifah,

We are pleased to inform you that your article is now available online at:

https://authors.elsevier.com/sd/article/S1878-450X(22)00106-8

You might like to bookmark this permanent URL to your article. Please note access to the full text of this article will depend on your personal or institutional entitlements.

The first published version of your article is made available at an early stage to provide fast access to your article and is not intended to be the final version of your article. The article will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note changes to the article should not be requested at this stage.

This version will be replaced by the final version as soon as this is available.

Your article can already be cited using the year of online availability and the DOI as follows: Author(s), Article Title, Journal (Year), DOI.

Once the full bibliographic details (including volume and page numbering) for citation purposes are available, you will be alerted by e-mail.

To track the status of your article throughout the publication process, please use our article tracking service:

https://authors.elsevier.com/tracking/article/details.do?aid=100571&jid=IJGFS&surname=Afifah

Kind regards,
Elsevier Researcher Support

Have questions or need assistance?
Please do not reply to this automated message.
For further assistance, please visit our Elsevier Support Center where you search for solutions on a range of topics and find answers to frequently asked questions.
You can also talk to our researcher support team by phone 24 hours a day from Monday-Friday and 24/7 by live chat and email.

© 2022 Elsevier Ltd | Privacy Policy http://www.elsevier.com/privacypolicy
Elsevier Limited, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, United Kingdom, Registration No. 1982084. This e-mail has been sent to you from Elsevier Ltd. To ensure delivery to your inbox (not bulk or junk folders), please add Article_Status@elsevier.com to your address book or safe senders list.

Mail FK UNDIP

diana nurafifah <d.nurafifah.dna@fk.undip.ac.id>

Corrections received - [IJGFS_100571]

1 message

optteam@elsevierproofcentral.com <optteam@elsevierproofcentral.com> 7 August 2022 at 10:15
To: d.nurafifah.dna@fk.undip.ac.id

This is an automatically generated message. Please do not reply because this mailbox is not monitored.

Dear Dr. Diana Nur Afifah,

Thank you very much for using the Proof Central application for your article "The addition of soy milk to pineapple chellies as a complementary alternative to nutritious snacks for children" in the journal "IJGFS"

All your corrections have been saved in our system. The PDF summary of your corrections, generated from Proof Central, can be downloaded from the following site for your reference:
https://pcv3-elsevier-live.s3.amazonaws.com/5c2be573aa1535a8569c6ad9e59aef/IJGFS_100571_edit_report.pdf

To track the status of your article throughout the publication process, please use our article tracking service:

http://authors.elsevier.com/TrackPaper.html?trk_article=IJGFS100571&trk_surname=

For help with article tracking:
http://support.elsevier.com/app/answers/detail/a_id/90

Kindly note that now we have received your corrections, your article is considered finalised and further amendments are no longer possible.

For further assistance, please visit our customer support site at http://support.elsevier.com. Here you can search for solutions on a range of topics. You will also find our 24/7 support contact details should you need any further assistance from one of our customer support representatives.

Yours sincerely,
Elsevier Proof Central team

When you publish in an Elsevier journal your article is widely accessible. All Elsevier journal articles and book chapters are automatically added to Elsevier's SciVerse Science Direct which is used by 16 million researchers. This means that Elsevier helps your research get discovered and ensures that you have the greatest impact with your new article.

www.sciencedirect.com

Mail FK UNDIP

diana nurafifah <d.nurafifah.dna@fk.undip.ac.id>

PLEASE TAKE ACTION - Share your article [IJGFS_100571]

1 message

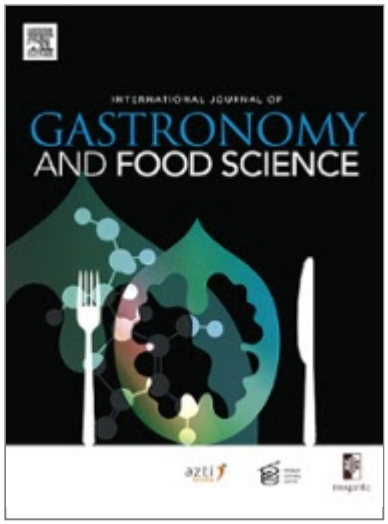
Elsevier - Article Status <Article_Status@elsevier.com> 19 August 2022 at 17:41
To: d.nurafifah.dna@fk.undip.ac.id

ELSEVIER

Share your article!

Dear Dr Afifah,

We are pleased to let you know that the final version of your article *The addition of soy milk to pineapple chellies as a complementary alternative to nutritious snacks for children* is now available online, containing full bibliographic details.



To help you access and share this work, we have created a Share Link – a personalized URL providing **50 days' free access** to your article. Anyone clicking on this link before October 08, 2022 will be taken directly to the final version of your article on ScienceDirect, which they are welcome to read or download. No sign up, registration or fees are required.

Your personalized Share Link:
https://authors.elsevier.com/a/1fcFT,gjWJpoUi

Click on the icons below to share with your network:

We encourage you to use this Share Link to download a copy of the article for your own archive. The URL is also a quick and easy way to share your work with colleagues, co-authors and friends. And you are welcome to add the Share Link to your homepage or social media profiles, such as Facebook and Twitter.

You can find out more about Share Links on Elsevier.com.

Did you know, as an author, you can use your article for a wide range of scholarly, non-commercial purposes, and share and post your article online in a variety of ways? For more information visit www.elsevier.com/sharing-articles.

Kind regards,
Elsevier Researcher Support

Increase your article's impact
Our Get Noticed guide contains a range of practical tips and advice to help you maximize visibility of your article.

Publishing Lab
Do you have ideas on how we can improve the author experience? Sign up for the Elsevier Publishing Lab and help us develop our publishing innovations!

Have questions or need assistance?
Please do not reply to this automated message.
For further assistance, please visit our Elsevier Support Center where you search for solutions on a range of topics and find answers to frequently asked questions.
You can also talk to our researcher support team by phone 24 hours a day from Monday-Friday and 24/7 by live chat and email.

© 2022 Elsevier Ltd | Privacy Policy http://www.elsevier.com/privacypolicy
Elsevier Limited, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, United Kingdom, Registration No. 1982084. This e-mail has been sent to you from Elsevier Ltd. To ensure delivery to your inbox (not bulk or junk folders), please add Article_Status@elsevier.com to your address book or safe senders list.