

BIBLIOGRAPHY

- Aguiar, E. V., Santos, F., Queiroz, V., & Capriles, V. (2023). A Decade of Evidence of Sorghum Potential in the Development of Novel Food Products: Insights from a Bibliometric Analysis. *MDPI Foods*.
- Al-Dashti, Y. A., Holt, R., Keen, C., & Hackman, R. (2021). Date Palm Fruit (*Phoenix dactylifera*): Effects on Vascular Health and Future Research Directions. *International Journal of Molecular Sciences*.
- Andhikawati, A., & Permana, R. (2022). EFFECT OF PAPER TYPE AS PACKAGING MATERIAL ON COOKING OIL ABSORPTION. *Global Scientifics Journals*.
- Asikin, Y., Wada, K., & Imai, Y. (2017). Compositions, taste characteristics, volatile profiles, and antioxidant activities of sweet sorghum (*Sorghum bicolor* L.) and sugarcane (*Saccharum officinarum* L.) syrups. *Journal of Food Measurement and Characterization*.
- Cardoso, L. d., Pinheiro, S., & Martino, H. (2016). Sorghum (*Sorghum bicolor* L.): Nutrients, bioactive compounds, and potential impact on human health. *Critical Reviews in Food Science and Nutrition*.
- Castro-Campos, F., Cabrera-Ramírez, A., & Morales-Sánchez, E. (2021). Impact of the popping process on the structural and thermal properties of sorghum grains (*Sorghum bicolor* L. Moench). *Food Chemistry*.
- Fatchullah, A., Auffadiina, J., & Sarah, G. (2022). IMPLEMENTASI FOOD DEHYDRATOR PADA PENGERINGAN BUNGA TELANG SEBAGAI PRODUK TEH UMKM KAMPUNG CENDANA KELURAHAN PERAK BARAT. *Jurnal Pengabdian Masyarakat*.
- Han, J. W., Garcia, L. R., Qian, J. P., & Yang, X. T. (2018). Food Packaging: A Comprehensive Review and Future Trends. *Comprehensive Reviews in Food Science and Food Safety*.
- Hanafiah, M. N., Suliansyah, I., Chaniago, I., Putri, N., & Silitonga, Y. (2023). UJI ADAPTASI BEBERAPA VARIETAS UNGGUL NASIONAL SORGUM (SORGUM BICOLOR. L) DI DESA BINTUJU KABUPATEN TAPANULI SELATAN. *Jurnal AGROHITA (Agroteknologi Fakultas Pertanian Universitas Muhammadiyah Tapanuli Selatan)*.
- Ibrahim, S. A., Fidan, H., & Aljaloud, S. (2021). Application of Date (*Phoenix dactylifera* L.) Fruit in the Composition of a Novel Snack Bar. *MDPI Foods*.
- Ibrahim, S. A., Fidan, H., & Aljaloud, S. O. (2021). Application of Date (*Phoenix dactylifera* L.) Fruit in the Composition of a Novel Snack Bar. *MDPI Foods*.
- Jafary, Hassan, S., & Ahmad. (2018). INVESTIGATION OF CHANGES IN ANTIOXIDANT ACTIVITIES OF CAMELIZATION PRODUCTS UNDER VARIOUS TIME REGIMES AND pH RANGES. *Carpathian Journal of Food Science & Technology*.
- Kazungu, F. K., Muindi, E., & Mulinge, J. (2023). Overview of Sorghum (*Sorghum bicolor* L), its Economic Importance, Ecological Requirements and Production Constraints in Kenya. *International Journal of Plant & Soil Science*.

- Khoddami, A., Messina, V., & Venkata, K. (2023). Sorghum in foods: Functionality and potential in. *CRITICAL REVIEWS IN FOOD SCIENCE AND NUTRITION*.
- Kowalska, H., Masiarz, E., & Ignaczak, A. (2023). Advances in Multigrain Snack Bar Technology and. *FOOD REVIEWS INTERNATIONAL*.
- López-Sandin, I., Gutiérrez-Soto, G., & Gutiérrez-Díez, A. (2021). Biomass and sugar production dynamics in sweet sorghum variety Roger. *Chilean journal of agricultural research*.
- Rajeswari, N. K., Saputra, I., & Setyawan, E. I. (2023). Pemanfaatan Sereal Sorgum (*Sorghum bicolor* L.) Sebagai Imunonutrisi Dalam Upaya Meningkatkan Sistem Imun Tubuh . *WORKSHOP DAN SEMINAR NASIONAL FARMASI 2023*.
- Silva, B. P., Anunciação, P., & Matyelka, J. (2017). Chemical composition of Brazilian chia seeds grown in different places. *Food Chemistry*.
- SNI 0123. (2008). *Karton Duplex*. Gjetur në <https://www.scribd.com/document/106308367/3116-sni-0123-2008-karton-duplex>
- Soni, D., & Saxena, G. (2018). Standardization and Development of Nutritious Snack Bar for Varied Age Groups. *Journal of Food Science and Technology*.
- Suloi, A. N., Rumitasari, A., & Farid, J. A. (2020). SNACK BARS : CAMILAN SEHAT RENDAH INDEKS GLIKEMIK SEBAGAI ALTERNATIF PENCEGAHAN PENDERITA DIABETES. *Jurnal Abdi*.
- Surahman, D. N., Ekafitri, R., Desnilasari, D., Ratnawati, L., Miranda, J., Cahyadi, W., & Indriati, A. (2020). PENDUGAAN UMUR SIMPAN SNACK BAR PISANG DENGAN METODE ARRHENIUS PADA SUHU PENYIMPANAN YANG BERBEDA (ESTIMATION OF BANANA SNACK BAR SHELF LIFE WITH DIFFERENT STORAGE TEMPERATURES USING ARRHENIUS METHOD). *BIOPROPAL INDUSTRI*, 127-137.
- Tanwar, R., Panghal, A., & Chaudhary , G. (2023). Nutritional, phytochemical and functional potential of sorghum: A review. *Food Chemistry Advances*.
- Teferra, T. F., & Awika, J. (2019). SSoorrghhuumm aass aa HHeeaallthhyy GGllloobbaall FFoooodd SSeecuurriitty. *Cereal Foods World*.
- USDA. (2019). *Chia Seeds*. Gjetur në FoodData Central: <https://fdc.nal.usda.gov/fdc-app.html#/food-details/170554/nutrients>
- Wijayabahu, A. T., Waugh, S., Ukhanova, M., & Mai, V. (2019). Dietary raisin intake has limited effect on gut microbiota composition in adult volunteers. *Nutrition Journal*.
- Wikström, F., Verghese, K., & Auras, R. (2019). Packaging Strategies That Save Food. *Journal of Industrial Ecology*, 515-738.
- Zadeh, R. S., Rad, A., & Armin, M. (2020). Study of caramelization conditions and sugar type on browning intensity and reducing and antioxidant properties of produced caramel. *Journal of Innovation in Food Science and Technology*.

APPENDIX

1. Approved Recipe



CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT

APPROVAL RECIPE

Recipe Name : SORGHUM SNACK BAR
TITLE OF C&D : UTILIZATION OF SORGHUM AND SORGHUM
SUGAR AS SNACK BARS
Yield : 32g/portion
Main Ingredients : 20g Sorghum, 20g Sorghum Sugar
Ingredients :
– 6g Dried mixed raisins, chopped
– 4g Dried dates, chopped
– 2g Chia seeds
– 8ml Oil

Method:

1. Toast the sorghum in a stainless steel saucepan with over low heat until slightly browned, about 8 minutes, set aside.
2. Put oil into the stainless steel saucepan, heat the oil over high heat. Add in the toasted sorghum, stir briefly and cover while shaking.
3. The sorghum will pop, like popcorn. Once fully popped, set aside.
4. Make the caramel, in a different pan, heat the 8g of sorghum sugar over low heat. After melted, add the popped sorghum and stir until evenly mixed, set aside and leave until the caramel hardens.
5. Mix the dried mixed raisins, dried dates, and popped sorghum. Make the caramel for the snack bar binder, heat the 12g of sorghum sugar in a pan over low heat, after melted, add in the mixture of popped sorghum, dried mixed raisins, and dried dates.
6. After evenly mixed, place into the mold, sprinkle chia seeds on top, and press it so it become solid and sticks.



CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT

Product Description

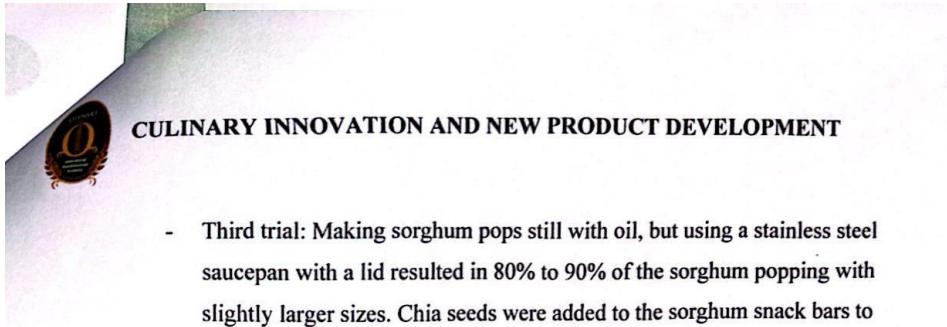
A sorghum snack bar is a snack that contains popped sorghum coated with sorghum sugar caramel, and then mixed with mixed dried raisins (cranberries, black raisins, golden raisins), dried dates, and chia seeds, which is glued with sorghum sugar caramel and solidified into a bar shape.

The purpose of this product is that it can be consumed by all ages because it uses sorghum sugar as its sweetener, which has a lower glycemic index than white sugar and glucose syrup. Sorghum itself contains higher fiber and iron content than white rice and wheat, and its glycemic index is also lower compared to white rice and wheat. Mixed with a variety of dried mixed raisins that contain antioxidants as well as chia seeds that are high in fiber and protein content. Will produce a long lasting energy boost for this sorghum snack bar.

The advantage of this product is having natural ingredients that are healthy without preservatives and artificial sweeteners, so this sorghum snack bar is long-lasting due to the presence of sorghum sugar, which comes from 100% of sorghum stem juice. This product also contains essential amino acids, which are typically only obtained from consuming foods.

TRIAL PROGRESS

- First trial: Making sorghum pops using margarine, the result is only a few popping. To adhere the sorghum, the caramel made in the pan was transferred elsewhere and exposed to air, the caramel is becomes hard quickly.
- Second trial: Making sorghum pops using oil, but using a non sticky pan with a low surface area resulted in limited movement for the popping sorghum, with only 60% of the sorghum popping. To adhere the sorghum to the caramelized sorghum sugar, popped sorghum, dried mixed raisins, and dried dates were added to the pan containing caramel.



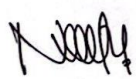


CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT

- Third trial: Making sorghum pops still with oil, but using a stainless steel saucepan with a lid resulted in 80% to 90% of the sorghum popping with slightly larger sizes. Chia seeds were added to the sorghum snack bars to enhance the benefits of the product.

TRIAL DOCUMENTATION



Student Name : Naufa Ulya
NIM : 2274130010020

Advisor	1 st Examiner	2 nd Examiner
 Name: Nori Indah P. Date: 27 Maret 2024.	 Name: Ryan Date: 27-3-24	 Name: Jessica Date: 27/03/24

2. Update Approved Recipe



CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT

APPROVAL RECIPE

Recipe Name : SORGHUM SNACK BAR
TITLE OF C&D : HIGH IN FIBER SNACK BAR FROM SORGHUM
AND SORGHUM SUGAR
Yield : 35g/portion
Main Ingredients : 20g Sorghum, 10g Sorghum Sugar
Ingredients :

- 6g Dried mixed raisins, chopped
- 4g Dried dates, chopped
- 2g Chia seeds
- 8ml Oil

Method:

1. Prepare all the ingredients and the utensils needed
2. Measure all the ingredients
3. Toast the sorghum in a stainless-steel saucepan with over low heat until slightly browned, about 2 minutes, set aside.
4. Put oil into the stainless-steel saucepan, heat the oil over high heat. Add in the toasted sorghum, stir briefly and cover while shaking.
5. The sorghum will pop, like popcorn. Once fully popped, chopped the pop-sorghum and set aside.
6. Make the caramel, in a different pan, heat the 5g of sorghum sugar over low heat. After melted, add the pop-sorghum and stir until evenly mixed, set aside and leave until the caramel hardens.
7. Mix the dried mixed raisins, dried dates, and caramelized pop-sorghum. Make the caramel for the snack bar binder, heat the 5g of sorghum sugar in a pan over low heat, after melted, add in the mixture of caramelized pop-sorghum, dried mixed raisins, and dried dates.



CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT

8. After evenly mixed, sprinkle chia seeds on top, place into the mold, and press it so it become compact.
9. After the snack bar has solidify and compact, then let them cool. Once cooled, the sorghum snack bar is ready.

Product Description

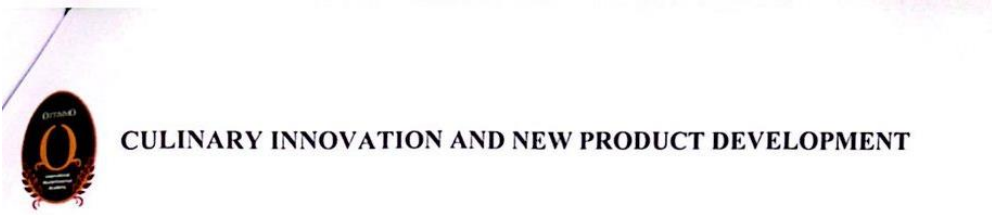
A sorghum snack bar is a snack that contains pop-sorghum coated with sorghum sugar caramel, and then mixed with mixed dried raisins (cranberries, black raisins, golden raisins), dried dates, and chia seeds, which is glued with sorghum sugar caramel and solidified into a bar shape.

The purpose of this product is that it can be consumed by all ages because it uses sorghum sugar as its sweetener, which has a lower glycemic index than white sugar and glucose syrup. Sorghum itself contains higher fiber and iron content than white rice and wheat, and its glycemic index is also lower compared to white rice and wheat. Mixed with a variety of dried mixed raisins that contain antioxidants as well as chia seeds that are high in fiber and protein content. Will produce a long lasting energy boost for this sorghum snack bar.

The advantage of this product is having natural ingredients that are healthy without preservatives and artificial sweeteners, so this sorghum snack bar is long-lasting due to the presence of sorghum sugar, which comes from 100% of sorghum stem juice. This product also contains essential amino acids, which are typically only obtained from consuming foods.

TRIAL PROGRESS

- First trial: Making sorghum pops using margarine, the result is only a few popping. To adhere the sorghum, the caramel made in the pan was transferred elsewhere and exposed to air, the caramel is becomes hard quickly.
- Second trial: Making sorghum pops using oil, but using a non sticky pan with a low surface area resulted in limited movement for the popping sorghum, with only 60% of the sorghum popping. To adhere the sorghum



CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT




to the caramelized sorghum sugar, pop-sorghum, dried mixed raisins, and dried dates were added to the pan containing caramel.

- Third trial: Making sorghum pops still with oil, but using a stainless steel saucepan with a lid resulted in 80% to 90% of the sorghum popping with slightly larger sizes. Chopping pop-sorghum into smaller pieces makes the snack ~~for~~ easier to compact.

TRIAL DOCUMENTATION



Student Name : Naufa Ulya
 NIM : 2274130010020

Advisor	1 st Examiner	2 nd Examiner
 Name: Novi Indah Permata Sari, S.T., M.Sc. Date:	 Name: Ryan Yeremia Iskandar, S.S. Date:	 Name: Jessica Hartan, A.Md. Par. Date: 16 July 2024

3. Approved Sensory



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CULINARY INNOVATION AND NEW PRODUCT DEVELOPMENT SENSORY TEST

DATE : 02 April 2024
NAME : Naufa Ulya
NIM : 2274130010020
PRODUCT : UTILIZATION OF SORGHUM AND SORGHUM SUGAR AS SNACK BARS
ADVISOR : Novi Indah Permata Sari, S.T., M.Sc.

PANELIST	SIGHT	SMELL	TEXTURE	TASTE	OVERALL	TOTAL
Panelist 1	5	5	4	2	3	19
Panelist 2	2	2	4	4	3	15
Panelist 3	4	4	4	4	4	20
Panelist 4	3	4	5	4	4	20
Panelist 5	4	4	3	5	5	21
Panelist 6	4	5	5	5	5	24
Panelist 7	4	4	2	2	4	16
Panelist 8	5	2	5	5	5	22
Panelist 9	4	4	3	4	4	19
Panelist 10	4	4	2	2	4	16
TOTAL	39	38	37	37	41	192

NOTES :

1. -
2. smell too savory. texture ok. flavor quite nice tp burn taste nya mengganggu. overall between yes and no
3. Sudah bagus
4. Good
5. Agak sedikit terlalu crunchy
6. Nice
7. Rasa gula merahnya mendominasi, tekstur berpasir kering
8. Ada bau gosong
9. Overall it's nice but once in a while the bar still crumbles
10. Karamelisasi gula nya sedikit dikurangi supaya tekstur tdk terlalu keras dan meminimalisir aroma gosong dari sorgum





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**CONSULTATION FORM
 CULINARY INNOVATION AND
 NEW PRODUCT DEVELOPMENT**

Name : Naura Unga
 Student Number : 2274130010020
 Advisor : Novi Leloh, P. M.Sc.

No	Date	Topic Consultation	Name/Signature	Advisor Signature
1.	9/March 2024	Product & Ingredients		Naura U.
2.	7/March 2024	Ingredients & Method		Naura U.
3.	7/March 2024	Consultation on the products ingredients & method	Naura U.	
4.	14/March 2024	Final Product 2 Ingredients		Naura U.
5.	18/3 2024	Final product Result.		Naura U.
6.	19/03 2024	Ingredients product		

4. Consultation Form

No	Date	Topic Consultation	Name/Signature	Advisor Signature
7.	19/03 24	Product & Ingredient Consultation	Naura U.	
8.	21/03 24	Product desing	Naura U.	
9.	21/03 24	Product Testing	Naura U.	
10.	22/03 24	Product result	Naura U.	
11.	14/5 2024	proposal		Naura U. Novi Leloh, P.
12.	20/5 2024	Proposal + ppt consultation Approval		Naura U.



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**CONSULTATION FORM
CULINARY INNOVATION AND
NEW PRODUCT DEVELOPMENT**

Name : Naufa Ulya
Student Number : 2274130010029
Advisor : Novi Wesh P. M.Sc.

No	Date	Topic Consultation	Name/Signature	Advisor Signature
13.	16/7 29	Bab IV 2 V		<i>Naufa</i>
14	31/7 24	Pencapaian Consultation & Exam Preparation		<i>Naufa</i>
15	6/8 2024	Final Report After Exam		<i>Naufa</i>

No	Date	Topic Consultation	Name/Signature	Advisor Signature

5. Systematic Process Documentation

1) Ingredients of sorghum snack bar



2) Making the pop-sorghum



3) Caramelized the pop-sorghum



4) Mixture of caramelized pop-sorghum, dried mix raisins, and dried dates



5) Melt the sorghum sugar for binder the mixture



6) Shape the snack bar

