

## REFERENCES

- Adekola, K. A. (2016). Engineering review food extrusion technology and its applications. *Journal of Food Science and Engineering*, 6(3), 149-168. doi: 10.17265/2159-5828/2016.03.005.
- Aderinola, T. A., Fagbemi, T. N., Enujiugha, V. N., Alashi, A. M., & Aluko, R. E. (2018). Amino acid composition and antioxidant properties of *Moringa oleifera* seed protein isolate and enzymatic hydrolysates. *Heliyon*, 4(10), e00877. DOI: 10.1016/j.heliyon.2018.e00877.
- Almoraie, N. M., Saqaan, R., Alharthi, R., Alamoudi, A., Badh, L., & Shatwan, I. M. (2021). Snacking patterns throughout the life span: potential implications on health. *Nutrition Research*, 91, 81-94. <https://doi.org/10.1016/j.nutres.2021.05.001>.
- Andriana, Y., Indriati, A., Mayasti, N. K. I., Iwansyah, A. C., Anggara, C. E. W., Litaay, C., & Triyono, A. (2021). Adlay (*Coix lacryma-jobi*), a potential source alternative to wheat flour: A financial feasibility analysis for small scale production. *In IOP Conference Series: Earth and Environmental Science* (Vol. 672, No. 1, p. 012032). IOP Publishing.
- Anton, A. A., & Luciano, F. B. (2007). Instrumental texture evaluation of extruded snack foods: a review evaluación instrumental de textura en alimentos extruidos: una revisión. *CYTA-Journal of Food*, 5(4), 245-251. <https://doi.org/10.1080/11358120709487697>.
- Arribas, C., Cabellos, B., Sánchez, C., Cuadrado, C., Guillamón, E., & Pedrosa, M. M. (2017). The impact of extrusion on the nutritional composition, dietary fiber and in vitro digestibility of gluten-free snacks based on rice, pea and carob flour blends. *Food & function*, 8(10), 3654-3663. DOI: 10.1039/C7FO00910K.
- Banerji, R., & Bajpai, A. (2009). Oil and fatty acid diversity in genetically variable clones of *Moringa oleifera* from India. *Journal of Oleo Science*, 58(1), 9-16. DOI: 10.5650/jos.58.9.
- Bianchi, F., Tolve, R., Rainero, G., Bordiga, M., Brennan, C. S., & Simonato, B. (2021). Technological, nutritional and sensory properties of pasta fortified with agro-industrial by-products: a review. *International Journal of Food Science & Technology*, 56(9), 4356-4366. <https://doi.org/10.1111/ijfs.15168>.
- Badan Pengawas Obat dan Makanan. (2022). Peraturan Badan Pengawas Obat Dan Makanan Nomor 1 Tahun 2022 Tentang Pengawasan Klaim Pada Label Dan Iklan Pangan Olahan. Jakarta: Badan Pengawas Obat dan Makanan Republik Indonesia.
- Badan Pengawas Obat dan Makanan. (2016). Peraturan Badan Pengawas Obat Dan Makanan Nomor 9 Tahun 2016 Tentang Acuan Label Gizi. Jakarta: Badan Pengawas Obat dan Makanan Republik Indonesia.
- Bolarinwa, I. F., Aruna, T. E., & Raji, A. O. (2019). Nutritive value and acceptability of bread fortified with moringa seed powder. *Journal of the Saudi Society of Agricultural Sciences*, 18(2), 195-200. <https://doi.org/10.1016/j.jssas.2017.05.002>.
- Bourekoua, H., Różyło, R., Gawlik-Dziki, U., Benatallah, L., Zidoune, M. N., & Dziki, D. (2018). Evaluation of physical, sensorial, and antioxidant properties of gluten-free bread enriched with *Moringa Oleifera* leaf powder. *European Food Research and Technology*, 244, 189-195. DOI:10.1007/s00217-017-2942-y.
- Chanvrier, H., Uthayakumaran, S., Appelqvist, I. A., Gidley, M. J., Gilbert, E. P., & López-Rubio, A. (2007). Influence of storage conditions on the structure, thermal behavior, and

- formation of enzyme-resistant starch in extruded starches. *Journal of Agricultural and Food Chemistry*, 55(24), 9883-9890.
- Chen, Y., Ye, R., Yin, L., & Zhang, N. (2014). Novel blasting extrusion processing improved the physicochemical properties of soluble dietary fiber from soybean residue and in vivo evaluation. *Journal of Food Engineering*, 120, 1-8.
- Chinma, C. E., Gbadamosi, K. B., Ogunsina, B. S., Oloyede, O. O., & Salami, S. O. (2014). Effect of addition of germinated moringa seed flour on the quality attributes of wheat-based cake. *Journal of Food Processing and Preservation*, 38(4), 1737-1742. DOI:10.1111/jfpp.12136.
- Corke, H., Huang, Y., & Li, J. S. (2016). Coix: overview. *Encyclopedia of food grains*, 1, 184-9. <https://doi.org/10.1016/B978-0-12-394437-5.00008-5>.
- De Pilli, T., Derossi, A., Talja, R. A., Jouppila, K., & Severini, C. (2012). Starch–lipid complex formation during extrusion-cooking of model system (rice starch and oleic acid) and real food (rice starch and pistachio nut flour). *European Food Research and Technology*, 234, 517-525.
- Drobny, J. G. (2014). *Handbook of thermoplastic elastomers*. Elsevier.
- Enriquez, J. P., & Gollub, E. (2023). Snacking Consumption among Adults in the United States: A Scoping Review. *Nutrients*, 15(7), 1596. <https://doi.org/10.3390/nu15071596>.
- Everitt, M. (2009). Consumer-Targeted Sensory Quality. *Global Issues In Food Science And Technology*, 117-128. doi: 10.1016/b978-0-12-374124-0.00008-9
- Fellows, P. J. (2022). *Food processing technology: principles and practice*. Woodhead publishing. <https://doi.org/10.1016/B978-0-323-85737-6.00005-4>.
- Feng, L., Zhao, Y., Zhang, Z., Zhang, S., Zhang, H., Yu, M., & Ma, Y. (2020). The edible and medicinal value of Coix lacryma-jobi and key cultivation techniques for high and stable yield. *Natural Resources*, 11(12), 569-575. DOI: 10.4236/nr.2020.1112034.
- Gao, Y., Sun, Y., Zhang, Y., Sun, Y., & Jin, T. (2022). Extrusion modification: Effect of extrusion on the functional properties and structure of rice protein. *Processes*, 10(9), 1871. <https://doi.org/10.3390/pr10091871>.
- Giuberti, G., Bresciani, A., Cervini, M., Frustace, A., & Marti, A. (2021). Moringa oleifera L. leaf powder as ingredient in gluten-free biscuits: nutritional and physicochemical characteristics. *European Food Research and Technology*, 247, 687-694. DOI:10.1007/s00217-020-03656-z.
- Giuberti, G., Rocchetti, G., Montesano, D., & Lucini, L. (2021). The potential of *Moringa oleifera* in food formulation: A promising source of functional compounds with health-promoting properties. *Current Opinion in Food Science*, 42, 257-269. DOI:10.1016/j.cofs.2021.09.001.
- González-Romero, J., Guerra-Hernández, E. J., & Rodríguez-Pérez, C. (2022). Bioactive compounds from *Moringa oleifera* as promising protectors of in vivo inflammation and oxidative stress processes. In *Current Advances for Development of Functional Foods Modulating Inflammation and Oxidative Stress* (pp. 379-399). Academic Press. <https://doi.org/10.1016/B978-0-12-823482-2.00011-X>.
- Gopalakrishnan, L., Doriya, K., & Kumar, D. S. (2016). *Moringa oleifera*: A review on nutritive importance and its medicinal application. *Food science and human wellness*, 5(2), 49-56.
- Goubgou, M., Songré-Ouattara, L. T., Bationo, F., Lingani-Sawadogo, H., Traoré, Y., & Savadogo, A. (2021). Biscuits: a systematic review and meta-analysis of improving the

- nutritional quality and health benefits. *Food Production, Processing and Nutrition*, 3(1), 1-18. <https://doi.org/10.1186/s43014-021-00071-z>.
- Govender, L., & Siwela, M. (2020). The effect of *Moringa oleifera* leaf powder on the physical quality, nutritional composition and consumer acceptability of white and brown breads. *Foods*, 9(12), 1910.
- Grosshagauer, S., Pirkwieser, P., Kraemer, K., & Somoza, V. (2021). The future of Moringa foods: A food chemistry perspective. *Frontiers in Nutrition*, 8, 751076. <https://doi.org/10.3389/fnut.2021.751076>.
- Gulati, P., Brahma, S., & Rose, D. J. (2020). Impacts of extrusion processing on nutritional components in cereals and legumes: Carbohydrates, proteins, lipids, vitamins, and minerals. In *Extrusion cooking* (pp. 415-443). Woodhead Publishing. [doi.org/10.1016/B978-0-12-815360-4.00013-4](https://doi.org/10.1016/B978-0-12-815360-4.00013-4).
- Guy, R. (Ed.). (2001). Extrusion cooking: technologies and applications. Woodhead publishing.
- Hashempour-Baltork, F., Torbati, M., Azadmard-Damirchi, S., & Savage, G. P. (2018). Quality properties of puffed corn snacks incorporated with sesame seed powder. *Food science & nutrition*, 6(1), 85-93. doi: 10.1002/fsn3.532.
- Heldman, D. R., Lund, D. B., & Sabliov, C. (Eds.). (2018). *Handbook of food engineering*. CRC press. <https://doi.org/10.1201/9780429449734>.
- Huang, X., Liu, H., Ma, Y., Mai, S., & Li, C. (2022). Effects of Extrusion on Starch Molecular Degradation, Order–Disorder Structural Transition and Digestibility—A Review. *Foods*, 11(16), 2538. <https://doi.org/10.3390/foods11162538>.
- Huth, M., Dongowski, G., Gebhardt, E., & Flamme, W. (2000). Functional properties of dietary fibre enriched extrudates from barley. *Journal of Cereal Science*, 32(2), 115-128.
- Indriati, A., Andriana, Y., Mayasti, N. K. I., Luthfiyanti, R., Iwansyah, A. C., & Tribowo, R. I. (2021). Techno-economic analysis on cookies production made from Adlay (*Coix lacryma-jobi*) flour that supplemented with moringa (*Moringa oleifera*) leaves powder. In *IOP Conference Series: Earth and Environmental Science* (Vol. 672, No. 1, p. 012033). IOP Publishing.
- Isitua, C. C., Lozano, M. J. S., Jaramillo, C., & Dutan, F. (2015). Phytochemical and nutritional properties of dried leaf powder of *Moringa oleifera* Lam. from machala el oro province of ecuador. *Asian J. Plant Sci. Res*, 5(2), 8-16.
- Jing, Y., & Chi, Y. J. (2013). Effects of twin-screw extrusion on soluble dietary fibre and physicochemical properties of soybean residue. *Food chemistry*, 138(2-3), 884-889.
- Karim, O. R., Kayode, R. M. O., Oyeyinka, S. A., & Oyeyinka, A. T. (2013). Proximate, mineral and sensory qualities of 'amala' prepared from yam flour fortified with moringa leaf powder. *Food Science and Quality Management*, 12(7), 10-22.
- Kaur, S., Sharma, S., Singh, B., & Dar, B. N. (2015). Effect of extrusion variables (temperature, moisture) on the antinutrient components of cereal brans. *Journal of food science and technology*, 52, 1670-1676. <https://doi.org/10.1007/s13197-013-1118-4>.
- Khanna, N (2019). Effect of Extrusion Cooking on Textural Properties of Extrudates-A Review. *Chem Sci Rev Lett* 2019, 8(30), 276-279 . (<http://creativecommons.org/licenses/by/3.0/>).
- Kumar, R., Xavier, K. M., Lekshmi, M., Balange, A., & Gudipati, V. (2018). Fortification of extruded snacks with chitosan: Effects on techno functional and sensory quality. *Carbohydrate polymers*, 194, 267-273. doi:10.1016/j.carbpol.2018.04.050.

- Lawless, H. T. & Heymann, H. (2010). *Sensory Evaluation of Food: Principles and Practices*. 2nd ed. Springer.
- Li, X. (2021). Effects of extrusion cooking on physical and nutritional quality of puffed snacks made from blends of barley and green lentil flours (Master's thesis).
- Liu, S., Alavi, S., & Abughoush, M. (2011). Extruded moringa leaf–oat flour snacks: physical, nutritional, and sensory properties. *International Journal of Food Properties*, 14(4), 854-869. <https://doi.org/10.1080/10942910903456358>.
- Malleshi, N. G., Agarwal, A., Tiwari, A., & Sood, S. (2021). Nutritional quality and health benefits. In *Millets and Pseudo Cereals* (pp. 159-168). Woodhead Publishing. <https://doi.org/10.1016/B978-0-12-820089-6.00009-4>.
- Morales, A. V., Manaois, R. V., Mamucod, H. F., Castillo, M. B., Belgina, P. R., & Romero, M. V. (2018). Quality characteristics and consumer acceptability of rice: adlai energy bar. *Philippine Journal of Crop Science* (Philippines).
- Moreno, C. R., Fernández, P. C. R., Rodríguez, E. O. C., Carrillo, J. M., & Rochín, S. M. (2018). Changes in nutritional properties and bioactive compounds in cereals during extrusion cooking. *Extrusion of metals, polymers and food products*, 104-124. DOI: 10.5772/intechopen.68753.
- Moyo, B., Masika, P. J., Hugo, A., & Muchenje, V. (2011). Nutritional characterization of Moringa (*Moringa oleifera* Lam.) leaves. *African Journal of Biotechnology*, 10(60), 12925-12933.
- Natabirwa, H., Nakimbugwe, D., Lung'aho, M., Tumwesigye, K. S., & Muyonga, J. H. (2020). Bean-based nutrient-enriched puffed snacks: Formulation design, functional evaluation, and optimization. *Food Science & Nutrition*, 8(9), 4763-4772. doi: 10.1002/fsn3.1727.
- Nielsen, S. S. (2017). *Food analysis laboratory manual*. Springer.
- Ogunsina, B. S., Radha, C., & Indrani, D. (2011). Quality characteristics of bread and cookies enriched with debittered *Moringa oleifera* seed flour. *International Journal of Food Sciences and Nutrition*, 62(2), 185-194. DOI: 10.3109/09637486.2010.526928.
- Olaofe, O., Adeyeye, E. I., & Ojugbo, S. (2013). Comparative study of proximate, amino acids and fatty acids of *Moringa oleifera* tree. *Elixir Appl Chem*, 54, 12543-12554.
- Olson, M. E., Sankaran, R. P., Fahey, J. W., Grusak, M. A., Odee, D., & Nouman, W. (2016). Leaf protein and mineral concentrations across the “Miracle Tree” genus *Moringa*. *PloS one*, 11(7), e0159782.
- Omosebi, M. O., Osundahunsi, O. F., & Fagbemi, T. N. (2018). Effect of extrusion on protein quality, antinutritional factors, and digestibility of complementary diet from quality protein maize and soybean protein concentrate. *Journal of Food Biochemistry*, 42(4), e12508. <https://doi.org/10.1111/jfbc.12508>.
- Ouahrani, S., Tzompa-Sosa, D. A., Dewettinck, K., & Zaidi, F. (2022). Oxidative stability, structural, and textural properties of margarine enriched with *Moringa oleifera* leaves extract. *Journal of the American Oil Chemists' Society*, 99(6), 485-499. DOI:10.1002/aocs.12586.
- Oyeyinka, S. A., Abiodun, O. A., Oyeyinka, A. T., Dauda, A. O., Grassby, T., & Ade-Omowaye, B. I. (2023). Role of *Moringa oleifera* in nutraceuticals and functional foods. In *Herbs, Spices and their Roles in Nutraceuticals and Functional Foods* (pp. 69-94). Academic Press. <https://doi.org/10.1016/B978-0-323-90794-1.00007-7>.

- Oyeyinka, A. T., & Oyeyinka, S. A. (2018). Moringa oleifera as a food fortificant: Recent trends and prospects. *Journal of the Saudi Society of Agricultural Sciences*, 17(2), 127-136. <https://doi.org/10.1016/j.jssas.2016.02.002>.
- Peñalver, R., Martínez-Zamora, L., Lorenzo, J. M., Ros, G., & Nieto, G. (2022). Nutritional and antioxidant properties of Moringa oleifera leaves in functional foods. *Foods*, 11(8), 1107. doi: 10.3390/foods11081107.
- Péronnet, F., Meynier, A., Sauvinet, V., Normand, S., Bourdon, E., Mignault, D., ... & Vinoy, S. (2015). Plasma glucose kinetics and response of insulin and GIP following a cereal breakfast in female subjects: Effect of starch digestibility. *European Journal of Clinical Nutrition*, 69(6), 740-745.
- Prayitno, S. A., Patria, D. G., Mardiana, N. A., Utami, D. R., Kusumawati, R., Rochma, N. A., & Niam, M. K. (2022). Fortification of Moringa oleifera Flour on Quality of Wet Noodle. *Food Science and Technology Journal (Foodscitech)*, 63-70.
- Saini, R. K., Shetty, N. P., & Giridhar, P. (2014). GC-FID/MS analysis of fatty acids in Indian cultivars of *Moringa oleifera*: potential sources of PUFA. *Journal of the American Oil Chemists' Society*, 91(6), 1029-1034.
- Sánchez-Machado, D. I., Núñez-Gastélum, J. A., Reyes-Moreno, C., Ramírez-Wong, B., & López-Cervantes, J. (2010). Nutritional quality of edible parts of *Moringa oleifera*. *Food analytical methods*, 3, 175-180.
- Sayuti, K., Yenrina, R., & Febri, Y. (2020, June). Characteristic of Analogue Jerky Made from Moringa Leaves (*Moringa oleifera* L) with the addition of Tapioca Flour. In IOP Conference Series: Earth and Environmental Science (Vol. 515, No. 1, p. 012057). IOP Publishing. doi:10.1088/1755-1315/515/1/012057.
- Sengev, A. I., Abu, J. O., & Gernah, D. I. (2013). Effect of Moringa oleifera leaf powder supplementation on some quality characteristics of wheat bread. *Food and nutrition sciences*, 4(3), 270. <http://dx.doi.org/10.4236/fns.2013.43036>.
- Sharifi, S., Majzoobi, M., & Farahnaky, A. (2021). Development of healthy extruded maize snacks; Effects of soybean flour and feed moisture content. *International Journal of Food Science & Technology*, 56(7), 3179-3187. <https://doi.org/10.1111/ijfs.14842>.
- Singh, S., Gamlath, S., & Wakeling, L. (2007). Nutritional aspects of food extrusion: a review. *International Journal of Food Science & Technology*, 42(8), 916-929. doi:10.1111/j.1365-2621.2006.01309.x.
- Su, B., & Chen, X. (2020). Current status and potential of *Moringa oleifera* leaf as an alternative protein source for animal feeds. *Frontiers in veterinary science*, 7, 53. doi: 10.3389/fvets.2020.00053.
- Subroto, E., Filianty, F., Indiarito, R., & Andita Shafira, A. (2022). Physicochemical and functional properties of modified adlay starch (*Coix lacryma-jobi*) by microwave and ozonation. *International Journal of Food Properties*, 25(1), 1622-1634. doi.org/10.1080/10942912.2022.2096061.
- Sultana, S. (2020). Nutritional and functional properties of Moringa oleifera. *Metabolism open*, 8, 100061. doi: 10.1016/j.metop.2020.100061.
- Sultana, N., Huque, K. S., Sazili, A. Q., Yaakub, H., Hossain, S. M. J., & Das, N. G. (2017). Study of Anti-nutritional Compounds, Antioxidant Activity and Fatty Acid Composition of Moringa (*Moringa oleifera* Lam.) Foliage. *Asian Journal of Agriculture and Food Sciences*, 5(3).
- Tewari, A., & Tiwari, S. (Eds.). (2018). *Synthesis of medicinal agents from plants*. Elsevier. <https://doi.org/10.1016/B978-0-08-102071-5.00014-3>.

- Thippeswamy, T. G., Shreedhar, M. V., Murty, B. S., & Thejaswi, N. (2020). Ascorbic acid and mineral content in *Moringa oleifera* leaves: A study of ascorbic acid stability. *Journal of Pharmaceutical Sciences and Research*, 12(7), 978-986.
- Trigo, C., Castelló, M. L., & Ortolá, M. D. (2022). Potentiality of *Moringa oleifera* as a Nutritive Ingredient in Different Food Matrices. *Plant Foods for Human Nutrition*, 1-13. doi: 10.1007/s11130-022-01023-9.
- Trigo, C., Castello, M. L., Ortola, M. D., Garcia-Mares, F. J., & Desamparados Soriano, M. (2020). *Moringa oleifera*: An unknown crop in developed countries with great potential for industry and adapted to climate change. *Foods*, 10(1), 31.
- Yang, S. H., Peng, J., Lui, W. B., & Lin, J. (2008). Effects of adlay species and rice flour ratio on the physicochemical properties and texture characteristic of adlay-based extrudates. *Journal of Food Engineering*, 84(3), 489-494. doi:10.1016/j.jfoodeng.2007.06.010.
- Weng, W. F., Peng, Y., Pan, X., Yan, J., Li, X. D., Liao, Z. Y., ... & Zhou, M. L. (2022). Adlay, an ancient functional plant with nutritional quality, improves human health. *Frontiers in Nutrition*, 9. <https://doi.org/10.3389/fnut.2022.1019375>.
- William, M., Mokoboki, H. K., Manyeula, F., Mabelebele, M., & Sebola, N. A. (2023). Carcass characteristics and meat quality of weaned New Zealand rabbits supplemented with *Moringa oleifera* leaves meal. *Italian Journal of Animal Science*, 22(1), 463-471. DOI:10.1080/1828051X.2023.2206416.
- Zhang, G., Ding, Y., Ni, C., Ban, Q., Xu, L., Guo, L., & Cheng, J. (2019). Physicochemical and morphological properties of extruded Adlay (*Coix lachryma-jobi* L) flour. *Journal of Chemistry*, 2019, 1-10. <https://doi.org/10.1155/2019/6239870>.