

REFERENCES

- Abbaspour, N., Hurrell, R., & Kelishadi, R. (2014). Review on iron and its importance for human health. *Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences*, 19(2), 164.
- Adams, A. M., Ahmed, R., Latif, A. M., Rasheed, S., Das, S. K., Hasib, E., ... & Faruque, A. S. G. (2017). Impact of fortified biscuits on micronutrient deficiencies among primary school children in Bangladesh. *PloS one*, 12(4), e0174673.
- Ahmad, S., & Sarbini, M. (2019). The effect of storage on vitamin c stability of locally grown fruits in brunei darussalam. *Innovare Journal Of Food Sciences*, 7(2). Retrieved 27 May 2022, from.
- Ahmed, I. A. (2019). Major dietary interventions for the management of liver disease. In *Dietary Interventions in Liver Disease* (pp. 205-212). Academic Press.
- Ajith, S., Pramod, S., Prabha Kumari, C., & Potty, V. P. (2015). Effect of storage temperatures and humidity on proximate composition, peroxide value and iodine value of raw cashew nuts. *Journal of food science and technology*, 52(7), 4631-4636.
- Akram, M., Munir, N., Daniyal, M., Egbuna, C., Găman, M. A., Onyekere, P. F., & Olatunde, A. (2020). Vitamins and Minerals: Types, sources and their functions. In *Functional Foods and Nutraceuticals* (pp. 149-172). Springer, Cham.
- Al-Fartusie, F. S., & Mohssan, S. N. (2017). Essential trace elements and their vital roles in human body. *Indian J Adv Chem Sci*, 5(3), 127-136.
- Amanda, V., Sulaiman, I., & Yunita, D. (2019, June). Variety of packaging and estimated shelf life of Acehese traditional food (pliek u). In *IOP Conference Series: Materials Science and Engineering* (Vol. 536, No. 1, p. 012121). IOP Publishing.
- Amezcu-Prieto, C., Martínez-Galiano, J. M., Cano-Ibáñez, N., Olmedo-Requena, R., Bueno-Cavanillas, A., & Delgado-Rodríguez, M. (2019). Types of carbohydrates intake during pregnancy and frequency of a small for gestational age newborn: a case-control study. *Nutrients*, 11(3), 523.
- Anggraini, P. D. K., & Salam, A. (2021). Acceptance, nutritional content, and shelf life of cookies based on millet flour as a functional food. *Technium Soc. Sci. J.*, 21, 795.
- Arif, S., Isdijoso, W., Fatah, A. R., & Tamyis, A. R. (2020). *Strategic Review of Food Security and Nutrition in Indonesia: 2019-2020 Update*. SMERU Research Institute
- AskUSDA. Ask.usda.gov. (2017). Retrieved 2 June 2022, from <https://ask.usda.gov/s/article/How-should-cookies-be-stored>.
- Athe, R., Dwivedi, R., Pati, S., Mazumder, A., & Banset, U. (2020). Meta-analysis approach on iron fortification and its effect on pregnancy and its outcome through randomized, controlled trials. *Journal of Family Medicine and Primary Care*, 9(2), 513.
- Ayalign, A., Urga, K., & Retta, N. (2012). The stability of micronutrients in fortified food stuffs after processing and storage: Iodine in salt and iron in wheat flour. *African Journal of Microbiology Research*, 6(20), 4226-4232.

- BADAN PENELITIAN DAN PENGEMBANGAN KESEHATAN KEMENTERIAN KESEHATAN RI. (2013). *Riset Kesehatan Dasar*.
- Bailey, R. L., West Jr, K. P., & Black, R. E. (2015). The epidemiology of global micronutrient deficiencies. *Annals of Nutrition and Metabolism*, 66(Suppl. 2), 22-33.
- Balestra, F., Verardo, V., Tappi, S., Caboni, M. F., Dalla Rosa, M., & Romani, S. (2019). Chemical and physical changes during storage of differently packed biscuits formulated with sunflower oil. *Journal of food science and technology*, 56(10), 4714-4721.
- Barclay, D. (1998). Multiple fortification of beverages. *Food and Nutrition Bulletin*, 19(2), 168-171.
- Bechoff, A., Taleon, V., Carvalho, L. M. J., Carvalho, J. L. V., & Boy, E. (2017). Micronutrient (provitamin A and iron/zinc) retention in biofortified crops. *African Journal of Food, Agriculture, Nutrition and Development*, 17(2), 11893-11904.
- Bell, L. N., & Hageman, M. J. (1994). Differentiating between the effects of water activity and glass transition dependent mobility on a solid state chemical reaction: aspartame degradation. *Journal of Agricultural and Food Chemistry*, 42(11), 2398-2401.
- Blanco, A., & Blanco, G. (2017). *Medical biochemistry*. Academic Press.
- Blencowe, H., Cousens, S., Modell, B., & Lawn, J. (2010). Folic acid to reduce neonatal mortality from neural tube disorders. *International journal of epidemiology*, 39(suppl_1), i110-i121.
- Brown, L. S. (2011). Nutrition requirements during pregnancy. *Essentials of life cycle nutrition. United States of America: Jones and Bartlett Publishers*.
- Buchholz, A. C., & Schoeller, D. A. (2004). Is a calorie a calorie?. *The American journal of clinical nutrition*, 79(5), 899S-906S.
- Caballero, B., Finglas, P., & Toldrá, F. (2015). *Encyclopedia of food and health*. Academic Press.
- Calligaris, S., Manzocco, L., Kravina, G., & Nicoli, M. C. (2007). Shelf-life modeling of bakery products by using oxidation indices. *Journal of agricultural and food chemistry*, 55(5), 2004-2009.
- Campbell, I. (2017). Macronutrients, minerals, vitamins and energy. *Anaesthesia & Intensive Care Medicine*, 18(3), 141-146.
- Carr, A. C., & Maggini, S. (2017). Vitamin C and immune function. *Nutrients*, 9(11), 1211.
- Caruso, M. C., Galgano, F., Colangelo, M. A., Condelli, N., Scarpa, T., Tolve, R., & Favati, F. (2017). Evaluation of the oxidative stability of bakery products by OXITEST method and sensory analysis. *European Food Research and Technology*, 243(7), 1183-1191.
- Cetin, Irene; Bühling, Kai; Demir, Cansun; Kortam, Ashraf; Prescott, Susan L.; Yamashiro, Yuichiro; Yarmolinskaya, Maria; Koletzko, Berthold (2019). *Impact of Micronutrient Status during Pregnancy on Early Nutrition Programming. Annals of Nutrition and Metabolism*, (), 269–278. doi:10.1159/000499698

- Cheng, Y. F., & Bhat, R. (2016). Functional, physicochemical and sensory properties of novel cookies produced by utilizing underutilized jering (*Pithecellobium jiringa* Jack.) legume flour. *Food Bioscience*, *14*, 54-61.
- Clarke, R. (1996). Micronutrient fortification of food: technology and quality control. *FAO Food and Nutrition Paper (FAO)*.
- Cormick, G., Betrán, A. P., Metz, F., Palacios, C., Beltrán-Velazquez, F., García-Casal, M. D. L. N., ... & Belizán, J. M. (2020). Regulatory and policy-related aspects of calcium fortification of foods. Implications for implementing national strategies of calcium fortification. *Nutrients*, *12*(4), 1022.
- Damodaran, S., Parkin, K. and Fennema, O. (2008). *Fennema's Food Chemistry*. 4th ed. Boca Raton: CRC Press/Taylor & Francis, 439 - 509.
- Darniadi, S., Rachmat, R., Luna, P., Purwani, W., & Sandrasari, D. A. (2020). Penentuan Umur Simpan Menggunakan Metode Accelerated Shelf Life Test (ASLT) pada Bubuk Minuman Instan Stroberi Foam-Mat Drying. *Jurnal Aplikasi Teknologi Pangan*, *9*(4), 151-157.
- Darnton-Hill, I., & Mkpuru, U. C. (2015). Micronutrients in pregnancy in low-and middle-income countries. *Nutrients*, *7*(3), 1744-1768.
- Dary, O., & Hurrell, R. (2006). Guidelines on food fortification with micronutrients. *World Health Organization, Food and Agricultural Organization of the United Nations: Geneva, Switzerland*, 1-376.
- Das, J. K., Salam, R. A., Kumar, R., & Bhutta, Z. A. (2013). Micronutrient fortification of food and its impact on woman and child health: a systematic review. *Systematic reviews*, *2*(1), 1-24.
- Dave, K., Sundrani, D., & Joshi, S. (2021). Influence of nutrition on reproductive health through epigenetic mechanisms. In *Epigenetics and Reproductive Health* (pp. 221-239). Academic Press.
- Devi, R. (2015). Food Processing and impact on nutrition. *Sch. J. Agric. Vet. Sci*, *2*, 304-311.
- Dewi, N. U., & Mahmudiono, T. (2021). Effectiveness of Food Fortification in Improving Nutritional Status of Mothers and Children in Indonesia. *International Journal of Environmental Research and Public Health*, *18*(4), 2133.
- Erdman Jr, J. W., Macdonald, I. A., & Zeisel, S. H. (Eds.). (2012). *Present knowledge in nutrition*. John Wiley & Sons.
- Elango, R., & Ball, R. O. (2016). Protein and amino acid requirements during pregnancy. *Advances in nutrition*, *7*(4), 839S-844S.
- Emongor, V. E., & Ramagonono, G. (2019). Storage temperature influences postharvest quality of wild plum (*Ximmenia Americana* L.) Fruit. *Ghana Journal of Science*, *60*(2), 1-10.
- Ems, T., St Lucia, K., & Huecker, M. R. (2021). Biochemistry, iron absorption. In *StatPearls [internet]*. StatPearls Publishing.

- Ernawati, F., Syaury, A., Arifin, A. Y., Soekatri, M. Y., & Sandjaja, S. (2021). Micronutrient Deficiencies and Stunting Were Associated with Socioeconomic Status in Indonesian Children Aged 6–59 Months. *Nutrients*, *13*(6), 1802.
- Faizah, N. I., & Haryanti, S. (2020). Pengaruh Lama dan Tempat Penyimpanan yang Berbeda Terhadap Kandungan Gizi Umbi Jalar (*Ipomoea batatas*) var. Manohara. *Jurnal Akademika Biologi*, *9*(2), 8-14.
- Fahmida, U., Santika, O., Kolopaking, R., & Ferguson, E. (2014). Complementary feeding recommendations based on locally available foods in Indonesia. *Food and nutrition bulletin*, *35*(4_suppl3), S174-S179.
- Fahmida, U., & Santika, O. (2016). Development of complementary feeding recommendations for 12–23-month-old children from low and middle socio-economic status in West Java, Indonesia: contribution of fortified foods towards meeting the nutrient requirement. *British Journal of Nutrition*, *116*(S1), S8-S15.
- Fathima, S. J., Nallamuthu, I., & Khanum, F. (2017). Vitamins and minerals fortification using nanotechnology: bioavailability and Recommended Daily Allowances. In *Nutrient Delivery* (pp. 457-496). Academic Press.
- FoodBank. (2014). *Food Storage Guidelines – FoodBank*. Foodbanksbc.org. Retrieved 2 June 2022, from <https://foodbanksbc.org/get-help/for-nonprofit-partners/food-storage-guidelines/>.
- Fu, B., & Labuza, T. P. (1997). *Shelf-Life Testing: Procedures and Prediction Methods*.
- Friedrich, W. (2013). *Vitamins*. Walter de Gruyter.
- Gallagher, M. S., Mahajan, P. V., & Yan, Z. (2011). Modelling chemical and physical deterioration of foods and beverages. In *Food and beverage stability and shelf life* (pp. 459-481). Woodhead Publishing.
- Gebreselassie, E., & Clifford, H. (2016). Oxidative Stability and Shelf Life of Crackers, Cookies, and Biscuits. In *Oxidative Stability and Shelf Life of Foods Containing Oils and Fats* (pp. 461-478). AOCS Press.
- Gernand, A. D., Schulze, K. J., Stewart, C. P., West, K. P., & Christian, P. (2016). Micronutrient deficiencies in pregnancy worldwide: health effects and prevention. *Nature Reviews Endocrinology*, *12*(5), 274-289.
- Ghoshal, G., & Kaushik, P. (2020). Development of soymeal fortified cookies to combat malnutrition. *Legume science*, *2*(3), e43.
- Gironés-Vilaplana, A., Villaño, D., Marhuenda, J., Moreno, D., & García-Viguera, C. (2017). Vitamins. *Nutraceutical And Functional Food Components*, 159-201. <https://doi.org/10.1016/b978-0-12-805257-0.00006-5>
- Greenberg, J. A., Bell, S. J., Guan, Y., & Yu, Y. H. (2011). Folic acid supplementation and pregnancy: more than just neural tube defect prevention. *Reviews in Obstetrics and Gynecology*, *4*(2), 52.

- Hans, K. B., & Jana, T. (2018). Micronutrients in the life cycle: Requirements and sufficient supply. *NFS Journal*, 11, 1-11.
- Hanidah, I. I., Sumanti, D. M., Mulyono, A. T., & Yusuf, N. P. (2021). Shelf-life Estimation of Instant Pempek Rajungan (*Portunus pelagicus*) Rancidity with the Arrhenius Acceleration Method. *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, 10(1).
- Hapsari, R. K. (2014). Penerapan Metode Accelerated Shelf Life Testing (ASLT)-Arrhenius untuk Konfirmasi Umur Simpan Produk Biskuit.
- Harris, G. K., & Marshall, M. R. (2017). Ash analysis. In *Food analysis* (pp. 287-297). Springer, Cham.
- Hastuti, A. Y. (2012). Aneka Cookies Paling Favorit, Populer, Istimewa. *Cetakan Pertama. Dunia Kreasi, Jakarta*.
- Hemery, Y. M., Lailou, A., Fontan, L., Jallier, V., Moench-Pfanner, R., Berger, J., & Avallone, S. (2018). Storage conditions and packaging greatly affects the stability of fortified wheat flour: Influence on vitamin A, iron, zinc, and oxidation. *Food chemistry*, 240, 43-50.
- Herawati, D., Simanjuntak, F., Syamsir, E., Lioe, H. N., & Briawan, D. (2015). Physicochemical properties of sweet potato cookies fortified with some nutrients. *International Food Research Journal*, 22(2).
- Hewavitharana, G. G., Perera, D. N., Navaratne, S. B., & Wickramasinghe, I. (2020). Extraction methods of fat from food samples and preparation of fatty acid methyl esters for gas chromatography: A review. *Arabian Journal of Chemistry*, 13(8), 6865-6875.
- Hiatt, A. N., Taylor, L. S., & Mauer, L. J. (2010). Influence of simultaneous variations in temperature and relative humidity on chemical stability of two vitamin C forms and implications for shelf life models. *Journal of agricultural and food chemistry*, 58(6), 3532-3540.
- Holesh, J. E., Aslam, S., & Martin, A. (2017). Physiology, Carbohydrates.
- Hough, G., Buera, M. D. P., Chirife, J., & Moro, O. (2001). Sensory texture of commercial biscuits as a function of water activity. *Journal of texture studies*, 32(1), 57-74.
- Hu, M., & Jacobsen, C. (Eds.). (2016). *Oxidative stability and shelf life of foods containing oils and fats*. Elsevier.
- Huang, Z., Liu, Y., Qi, G., Brand, D., & Zheng, S. G. (2018). Role of vitamin A in the immune system. *Journal of clinical medicine*, 7(9), 258.
- Iodine Fact Sheet for Consumers. (2022). Retrieved 21 February 2022, from <https://ods.od.nih.gov/factsheets/Iodine-Consumer/>.
- Igbabul, B., Ogunrinde, M. D., & Amove, J. (2018). Proximate, micronutrient composition, physical and sensory properties of cookies produced with wheat, sweet detar and moringa leaf flour blends. *Current Research in Nutrition and Food Science Journal*, 6(3), 690-699.
- Ishera, L. R., Mahendran, T., & Roshana, M. R. (2021). Incorporating Breadfruit Flour to Prepare High-Quality Cookies with Health Benefits. *Tropical Agricultural Research*, 32(1), 114-123.

- Jajda, H., Patel, K., Patel, S., Solanki, V., Patel, K., & Singh, S. (2013). Comparative efficacy of two standard methods for determination of iron and zinc in fruits, pulses and cereals. *Journal Of Food Science And Technology*, 52(2), 1096-1102. doi: 10.1007/s13197-013-1088-6
- Jutkus, R. A., Li, N., Taylor, L. S., & Mauer, L. J. (2015). Effect of temperature and initial moisture content on the chemical stability and color change of various forms of vitamin C. *International Journal of Food Properties*, 18(4), 862-879.
- Jones, D., Caballero, S., & Davidov-Pardo, G. (2019). Bioavailability of nanotechnology-based bioactives and nutraceuticals. In *Advances in food and nutrition research* (Vol. 88, pp. 235-273). Academic Press.
- Karo, Y. C. B., Nopianti, R., & Lestari, S. D. (2017). Pengaruh variasi suhu terhadap mutu abon ikan ekonomis rendah selama penyimpanan. *Jurnal Fishtech*, 6(1), 80-91.
- Kemenkes, R. I. (2019). Peraturan Menteri Kesehatan Republik Indonesia nomor 28 tahun 2019 tentang angka kecukupan gizi yang dianjurkan untuk masyarakat Indonesia. Jakarta, Kemenkes RI.
- Kemenkes, R. I. (2016). Peraturan Menteri Kesehatan Republik Indonesia nomor 51 tahun 2016 tentang standar produk suplementasi gizi yang dianjurkan untuk masyarakat Indonesia. Jakarta, Kemenkes RI.
- Kiondo, P., Wamuyu-Maina, G., Wandabwa, J., Bimenya, G. S., Tumwesigye, N. M., & Okong, P. (2014). The effects of vitamin C supplementation on pre-eclampsia in Mulago Hospital, Kampala, Uganda: a randomized placebo controlled clinical trial. *BMC Pregnancy and Childbirth*, 14(1), 1-10.
- Kramer, A. (1977). Effect of storage on nutritive value of food 1. *Journal of food quality*, 1(1), 23-55.
- Kulthe, A. A., Thorat, S. S., & Lande, S. B. (2017). Evaluation of physical and textural properties of cookies prepared from pearl millet flour. *International Journal of Current Microbiology and Applied Sciences*, 6(4), 692-701.
- Kuong, K., Lailou, A., Chea, C., Chamnan, C., Berger, J., & Wieringa, F. T. (2016). Stability of Vitamin A, iron and zinc in fortified rice during storage and its impact on future national standards and programs—Case study in Cambodia. *Nutrients*, 8(1), 51.
- Labuza, T. P. (1982). *Shelf-life dating of foods*. Food & Nutrition Press, Inc.
- Laitinen, K. (2021). Fat Requirements in Pregnancy and Infancy.
- Lešková, A. S. M. M. E. (2006). Vitamin C degradation during storage of fortified foods. *Journal of food and nutrition research*, 45(2), 55-61.
- Limon-Miro, A. T., Lopez-Teros, V., & Astiazaran-Garcia, H. (2019). Dynamic macronutrient meal-equivalent menu method: towards individual nutrition intervention programs. *Methods and protocols*, 2(3), 78.

- Loza, A., Quispe, M., Villanueva, J., & P Peláez, P. (2017). Development of functional cookies with wheat flour, banana flour (*Musa paradisiaca*), sesame seeds (*Sesamum indicum*) and storage stability. *Scientia Agropecuaria*, 8(4), 315-325.
- Lykstad, J., & Sharma, S. (2020). Biochemistry, Water Soluble Vitamins. *StatPearls [Internet]*.
- Mahabadi, N., Bhusal, A., & Banks, S. W. (2020). Riboflavin Deficiency. *StatPearls [Internet]*.
- Mahesar, S. A., Sherazi, S. T. H., Khaskheli, A. R., Kandhro, A. A., & Uddin, S. (2014). Analytical Approaches for free fatty acids assessment in oils and fats. *Analytical Methods*, 6(14), 4956-4963.
- Manzocco, L., Calligaris, S., & Nicoli, M. C. (2010). Methods for food shelf life determination and prediction. In *Oxidation in foods and beverages and antioxidant applications* (pp. 196-222). Woodhead Publishing.
- Manzocco, L., Romano, G., Calligaris, S., & Nicoli, M. C. (2020). Modeling the effect of the oxidation status of the ingredient oil on stability and shelf life of low-moisture bakery products: The case study of crackers. *Foods*, 9(6), 749.
- Marak, N. R., Malemnganbi, C. C., Marak, C. R., & Mishra, L. K. (2019). Functional and antioxidant properties of cookies incorporated with foxtail millet and ginger powder. *Journal of Food Science and Technology*, 56(11), 5087-5096.
- Martel, J. L., Kerndt, C. C., & Franklin, D. S. (2018). Vitamin B1 (thiamine).
- McClure, S. T., Chang, A. R., Selvin, E., Rebholz, C. M., & Appel, L. J. (2017). Dietary sources of phosphorus among adults in the United States: results from NHANES 2001–2014. *Nutrients*, 9(2), 95.
- Micronutrients*. Who.int. (2022). Retrieved 24 February 2022, from https://www.who.int/health-topics/micronutrients#tab=tab_1.
- Morris, A. L., & Mohiuddin, S. S. (2020). Biochemistry, nutrients.
- Mudgil, D., & Barak, S. (2017). *Functional Foods: Sources and Health Benefits*. Scientific Publishers.
- Murray, J. E., Laurieri, N., & Delgoda, R. (2017). Chapter 24. Proteins. *Pharmacognosy Fundamentals, Applications and Strategies*, 477-94.
- Musa, A., & Lawal, T. (2013). Proximate composition of ten types of biscuits and their susceptibility to *Tribolium castaneum* Herbst (Tenebrionidae: Bostrichidae) in Nigeria. *Food Science and Quality Management*, 14, 163-169.
- Muslihah, N., Khomsan, A., Riyadi, H., & Briawan, D. (2018). The comparison effect of small-quantity lipid-based nutrient supplements and biscuit on hemoglobin level of infants in Indonesia. *Indonesian Journal of Human Nutrition*, 4(2), 97-107.
- Muttagi, G. C., & Ravindra, U. (2020). Effect of Storage on Moisture, Free Fatty Acid and Peroxide Value of Products Developed by Incorporating Modified Rice Starch.

- MSi, A. S., & Bin, A. (2016). Metode accelerated shelf life test (aslt) dengan pendekatan arrhenius dalam pendugaan umur simpan sari buah nenas, pepaya dan cempedak.
- Nasional, B. S. (1992). Mutu dan cara uji biskuit. *SNI*, 1(2973), 1992.
- Nasional, B. S. (2011). SNI 2973: 2011 Biskuit. *Jakarta: Badan Standardisasi Nasional*.
- National Research Council. (1989). *Diet and health: implications for reducing chronic disease risk*. National Academies Press.
- Nielsen, S. S. (2017). *Food analysis laboratory manual*. Springer.
- Nurhidajah, N., Pranata, B., & Yonata, D. (2021). PEMODELAN PERSAMAAN ARRHENIUS UNTUK MEMREDIKSI UMUR SIMPAN PENYEDAP RASA CANGKANG RAJUNGAN. *Agrointek: Jurnal Teknologi Industri Pertanian*, 15(2), 566-573.
- Office of Dietary Supplements - Selenium. Ods.od.nih.gov. (2022). Retrieved 21 February 2022, from <https://ods.od.nih.gov/factsheets/Selenium-Consumer/>.
- Office of Dietary Supplements - Zinc. Ods.od.nih.gov. (2022). Retrieved 21 February 2022, from <https://ods.od.nih.gov/factsheets/Zinc-HealthProfessional/>.
- Ogunyinka, B. I., Oyinloye, B. E., Osunsanmi, F. O., Kappo, A. P., & Opoku, A. R. (2017). Comparative study on proximate, functional, mineral, and antinutrient composition of fermented, defatted, and protein isolate of *Parkia biglobosa* seed. *Food science & nutrition*, 5(1), 139-147.
- Olson, R., Gavin-Smith, B., Ferraboschi, C., & Kraemer, K. (2021). Food Fortification: The Advantages, Disadvantages and Lessons from Sight and Life Programs. *Nutrients*, 13(4), 1118.
- Orriss, G. D. (1998). Food fortification: Safety and legislation. *Food and Nutrition Bulletin*, 19(2), 109-116.
- Oyem, H. H. (2010). Effect of Water Activity on the Free Fatty Acid Value of Crude Palm Oil during Storage. *International Journal of Tropical Agriculture and Food Systems*, 4(3), 278-280.
- Pfeiffer, C.M. (2013). *Encyclopedia of Human Nutrition || Biochemical Indices*. , (), 156–174. doi:10.1016/b978-0-12-375083-9.00198-7
- Phimolsiripol, Y., & Suppakul, P. (2016). Techniques in shelf life evaluation of food products.
- Pongajow, N., Djarkasi, G., & Mandey, L. (2015). PENDUGAAN UMUR SIMPAN HALUA KENARI MENGGUNAKAN METODE ACCELERATED SHELF LIFE TESTING (ASLT) MODEL ARRHENIUS PADA UKM KEPULAUAN SITARO. *Ilmu Dan Teknologi Pangan*, 3(2).
- Popov-Raljić, J., Mastilović, J., Laličić-Petronijević, J., Kevrešan, Ž., & Demin, M. (2013). Sensory and color properties of dietary cookies with different fiber sources during 180 days of storage. *Hemijaska industrija*, 67(1), 123-134.
- Plečaš, D., Plešinac, S., & Kontić-Vučinić, O. (2014). Nutrition in pregnancy: basic principles and recommendations. *Srpski arhiv za celokupno lekarstvo*, 142(1-2), 125-130.

- Pratiwi, L. D. (2017). Pendugaan Umur Simpan Cookies Sumber Protein dan Energi dari Tepung Campuran Berbasis Mocaf dengan Variasi Kemasan. *Skripsi. Program Studi Ilmu dan Teknologi Pangan Universitas Negeri Sebelas Maret Surakarta. Surakarta.*
- Pravina, P., Sayaji, D., & Avinash, M. (2013). Calcium and its role in human body. *International Journal of Research in Pharmaceutical and Biomedical Sciences*, 4(2), 659-668.
- Rahmawati, F., & Hana, C. (2016). Penetapan kadar vitamin c pada bawang putih (*Allium sativum*, L) dengan metode iodimetri. *CERATA Jurnal Ilmu Farmasi*, 4(1).
- Rahman, T., Sulaiman, N. F., Turmala, E., Andriansyah, R. C. E., Luthfiyanti, R., & Triyono, A. (2019, March). Shelflife prediction of biscuits prepared from modified suweg (*Amorphophallus campanulatus* B) flour using Arrhenius model. In *IOP Conference Series: Earth and Environmental Science* (Vol. 251, No. 1, p. 012035). IOP Publishing.
- Rangrej, V., Shah, V., Patel, J., & Ganorkar, P. M. (2015). Effect of shortening replacement with flaxseed oil on physical, sensory, fatty acid and storage characteristics of cookies. *Journal of food science and technology*, 52(6), 3694-3700.
- Rizki Ramadhani, A. (2021). Pendugaan Umur Simpan Cookies MPASI dari Tepung Menir dengan Metode Arrhenius di BB Pascapanen, Bogor.
- Robertson, G. L. (2009). *Food Packaging and Shelf Life : a Practical Guide*. 408.
- Rukmi, A. (2011). Pengaruh penyimpanan terhadap mutu biskuit yang diperkaya dengan tepung Ikan Lele Dumbo (*Clarias gariepinus*) dan isolat protein Kedelai (*Glycine max*).
- Sakurai, M., Nakagawa, H., Kadota, A., Yoshita, K., Nakamura, Y., Okuda, N., ... & Miura, K. (2018). Macronutrient intake and socioeconomic status: NIPPON DATA2010. *Journal of epidemiology*, 28(Supplement_III), S17-S22.
- Sanvictores, T., & Chauhan, S. (2021). Vitamin B5 (Pantothenic Acid). *StatPearls [Internet]*.
- Šarić, B. M., Nedeljković, N. M., Šimurina, O. D., Pestorić, M. V., Kos, J. J., Mandić, A. I., ... & Mišan, A. Č. (2014). The influence of baking time and temperature on characteristics of gluten free cookies enriched with blueberry pomace. *Food and Feed Research*, 41(1), 39-46.
- Sayuti, K. (2002). Blood Biochemistry Profile of Pregnant Women Consumed Fortified Cookies with Iron (Fe), Folic Acid, Vitamin A, Vitamin C, Zinc (Zn), and Iodine.
- Sharma, S., & Riar, C. S. (2020). Effect of storage period and packaging materials on textural, phenolic, antioxidant properties of cookies made from raw and germinated minor millet blends flour. *Food Science and Technol*, 21(1), 74-85.
- Sharma, N., Sharma, S., Singh, B., & Kaur, G. (2020). Stability evaluation of iron and vitamin A during processing and storage of fortified pasta. *Quality Assurance and Safety of Crops & Foods*, 12(2), 50-60.
- Shergill-Bonner, R. (2017). Micronutrients. *Paediatrics and Child Health*, 27(8), 357-362.

- Simanjuntak, M. K., Buchari, D., & Suparmi, S. (2016). *Prediction the Shelf Life of Cookies Fortified with Catfish (Pangasius Hypophthalmus) Protein Concentrate Using Different Packaging* (Doctoral dissertation, Riau University).
- Sinbad, O. O., Folorunsho, A. A., Olabisi, O. L., Ayoola, O. A., & Temitope, E. J. (2019). Vitamins as antioxidants. *Journal of Food Science and Nutrition Research*, 2(3), 214-235.
- Sofyan, Muhammad & Mercilia, Emily. (2018). Assessing Preference for Cookies Development Among Indonesian Consumer.
- Stach, K., Stach, W., & Augoff, K. (2021). Vitamin B6 in health and disease. *Nutrients*, 13(9), 3229.
- Sulaiman, I. (2021). *Pengemasan dan Penyimpanan Produk Bahan Pangan*. Syiah Kuala University Press.
- Supriatna, I. G. R., Putra, G. G., & Suhendra, L. (2018). PENDUGAAN UMUR SIMPAN MENGGUNAKAN METODE ACCELERATED SHELF-LIFE TESTING (ASLT) DENGAN PENDEKATAN ARRHENIUS PADA DESTILAT CUKA FERMENTASI HASIL SAMPING CAIRAN PULPA KAKAO. *Jurnal REKAYASA DAN MANAJEMEN AGROINDUSTRI ISSN*, 6(2), 178-188.
- 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*, 11(2), 127-137.
- Thiamin, R. (1998). Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, pantothenic acid, biotin, and choline.
- Triharini, M., Sulistyono, A., Adriani, M., & Hsieh, P. L. (2018). Perceived Benefits and Intakes of Protein, Vitamin C and Iron in Preventing Anemia among Pregnant Women. *Jurnal Ners*, 13(2), 156-161.
- Trugo, N.M.F. (2003). Encyclopedia of Food Sciences and Nutrition || FATS | Requirements. , (), 2279–2284. doi:10.1016/b0-12-227055-x/00444-2
- Ullah, S. R., Murphy, B., Dorich, B., Richter, B., & Srinivasan, K. (2011). Fat extraction from acid-and base-hydrolyzed food samples using accelerated solvent extraction. *Journal of agricultural and food chemistry*, 59(6), 2169-2174.
- Vytřasová, L. Č. I. B. J. (2006). Effects of the principal ingredients of biscuits upon water activity. *Journal of Food and Nutrition Research*, 45(1), 39-43.
- Wheal, M. S., DeCourcy-Ireland, E., Bogard, J. R., Thilsted, S. H., & Stangoulis, J. C. (2016). Measurement of haem and total iron in fish, shrimp and prawn using ICP-MS: Implications for dietary iron intake calculations. *Food Chemistry*, 201, 222-229.
- Winkelhausen, E., Jovanovic-Malinovska, R., Velickova, E., & Kuzmanova, S. (2007). Sensory and microbiological quality of a baked product containing xylitol as an alternative sweetener. *International Journal of food properties*, 10(3), 639-649.

- Wirakartakusumah, M. A., & Hariyadi, P. (1998). Technical aspects of food fortification. *Food and nutrition bulletin*, 19(2), 101-108.
- Yang, Z., & Huffman, S. L. (2011). Review of fortified food and beverage products for pregnant and lactating women and their impact on nutritional status. *Maternal & Child Nutrition*, 7, 19-43.
- Yakoob, M. Y., Khan, Y. P., & Bhutta, Z. A. (2010). Maternal mineral and vitamin supplementation in pregnancy. *Expert Review of Obstetrics & Gynecology*, 5(2), 241-256.
- Yaradua, I., Nasir, A., Alhassan, A., Kanadi, A., Matazu, K., Ibrahim, M., & Suleiman, Z. (2018). MICRO-NUTRIENTS INTERACTIONS AND DEFICIENCIES – A REVIEW.
- Zempleni, J., Suttie, J. W., Gregory III, J. F., & Stover, P. J. (Eds.). (2013). *Handbook of vitamins*. CRC Press.
- Zhao, Q., Guo, H., Hou, D., Laraib, Y., Xue, Y., & Shen, Q. (2021). Influence of temperature on storage characteristics of different rice varieties. *Cereal Chemistry*, 98(4), 935-945.
- Zhao, A., Xue, Y., Zhang, Y., Li, W., Yu, K., & Wang, P. (2016). Nutrition concerns of insufficient and excessive intake of dietary minerals in lactating women: a cross-sectional survey in three cities of China. *PLoS One*, 11(1), e0146483.
- Zoroddu, M. A., Aaseth, J., Crisponi, G., Medici, S., Peana, M., & Nurchi, V. M. (2019). The essential metals for humans: a brief overview. *Journal of inorganic biochemistry*, 195, 120-129.

APPENDICES



Appendix 1. Cookies dough added with premix



Appendix 2. Baked cookies at 170C for 15 minutes

	Temperature	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Water Activity	Before storage	.223	9	.200*	.838	9	.055
	After storage 30°C	.256	9	.092	.860	9	.095
	After storage 37°C	.275	9	.048	.780	9	.012
	After storage 45°C	.201	9	.200*	.903	9	.270
Texture	Before storage	.211	9	.200*	.864	9	.107
	After storage 30°C	.203	9	.200*	.845	9	.065
	After storage 37°C	.250	9	.110	.879	9	.152
	After storage 45°C	.204	9	.200*	.858	9	.092

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix 3. Normality test results of physicochemical properties of fortified cookies

		Sum of Squares	df	Mean Square	F	Sig.
Water Activity	Between Groups	1579.861	3	526.620	203.307	<.001
	Within Groups	82.889	32	2.590		
	Total	1662.750	35			
Texture	Between Groups	1405320.111	3	468440.037	97.644	<.001
	Within Groups	153518.444	32	4797.451		
	Total	1558838.556	35			

Appendix 4. ANOVA test results of physicochemical properties of fortified cookies

Multiple Comparisons

Tukey HSD				Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Dependent Variable	(I) Temp	(J) Temp					Lower Bound	Upper Bound
Water Activity	Before storage	After storage 30°C		2.11111*	.75869	.042	.0555	4.1667
		After storage 37°C		-2.00000	.75869	.059	-4.0556	.0556
		After storage 45°C		-14.88889*	.75869	<.001	-16.9445	-12.8333
	After storage 30°C	Before storage		-2.11111*	.75869	.042	-4.1667	-.0555
		After storage 37°C		-4.11111*	.75869	<.001	-6.1667	-2.0555
		After storage 45°C		-17.00000*	.75869	<.001	-19.0556	-14.9444
	After storage 37°C	Before storage		2.00000	.75869	.059	-.0556	4.0556
		After storage 30°C		4.11111*	.75869	<.001	2.0555	6.1667
		After storage 45°C		-12.88889*	.75869	<.001	-14.9445	-10.8333

	After storage 45°C	Before storage	14.88889*	.75869	<.001	12.8333	16.9445
		After storage 30°C	17.00000*	.75869	<.001	14.9444	19.0556
		After storage 37°C	12.88889*	.75869	<.001	10.8333	14.9445
Texture	Before storage	After storage 30°C	278.66667*	32.65119	<.001	190.2028	367.1306
		After storage 37°C	420.11111*	32.65119	<.001	331.6472	508.5750
		After storage 45°C	526.77778*	32.65119	<.001	438.3139	615.2417
	After storage 30°C	Before storage	-278.66667*	32.65119	<.001	-367.1306	-190.2028
		After storage 37°C	141.44444*	32.65119	<.001	52.9806	229.9083
		After storage 45°C	248.11111*	32.65119	<.001	159.6472	336.5750
	After storage 37°C	Before storage	-420.11111*	32.65119	<.001	-508.5750	-331.6472
		After storage 30°C	-141.44444*	32.65119	<.001	-229.9083	-52.9806
		After storage 45°C	106.66667*	32.65119	.013	18.2028	195.1306
After storage 45°C	Before storage	-526.77778*	32.65119	<.001	-615.2417	-438.3139	
	After storage 30°C	-248.11111*	32.65119	<.001	-336.5750	-159.6472	
	After storage 37°C	-106.66667*	32.65119	.013	-195.1306	-18.2028	

*. The mean difference is significant at the 0.05 level.

Appendix 5. Tukey *post-hoc* test results of physicochemical properties (One-Way ANOVA)

	Temp	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Moisture	Before storage	.370	3	.	.787	3	.083
	After storage 30°C	.215	3	.	.989	3	.800
	After storage 37°C	.262	3	.	.956	3	.598
	After storage 45°C	.236	3	.	.977	3	.712

a. Lilliefors Significance Correction

Appendix 6. Normality test results of moisture of fortified cookies

Moisture	Sum of Squares	df	Mean Square	F	Sig.
----------	----------------	----	-------------	---	------

Between Groups	58395.333	3	19465.111	36.058	<.001
Within Groups	4318.667	8	539.833		
Total	62714.000	11			

Appendix 7. ANOVA test results of moisture of fortified cookies

Multiple Comparisons

Dependent Variable: Moisture						
Tukey HSD						
(I) Temp	(J) Temp	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Before storage	After storage 30°C	109.66667*	18.97074	.002	48.9157	170.4176
	After storage 37°C	88.00000*	18.97074	.007	27.2490	148.7510
	After storage 45°C	-64.33333*	18.97074	.038	-125.0843	-3.5824
After storage 30°C	Before storage	-109.66667*	18.97074	.002	-170.4176	-48.9157
	After storage 37°C	-21.66667	18.97074	.676	-82.4176	39.0843
	After storage 45°C	-174.00000*	18.97074	<.001	-234.7510	-113.2490
After storage 37°C	Before storage	-88.00000*	18.97074	.007	-148.7510	-27.2490
	After storage 30°C	21.66667	18.97074	.676	-39.0843	82.4176
	After storage 45°C	-152.33333*	18.97074	<.001	-213.0843	-91.5824
After storage 45°C	Before storage	64.33333*	18.97074	.038	3.5824	125.0843
	After storage 30°C	174.00000*	18.97074	<.001	113.2490	234.7510
	After storage 37°C	152.33333*	18.97074	<.001	91.5824	213.0843

*. The mean difference is significant at the 0.05 level.

Appendix 8. Tukey *post-hoc* test results of moisture (One-Way ANOVA)

	Temp	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Iron	Before storage	.321	3	.	.882	3	.330
	After storage 30°C	.370	3	.	.786	3	.082
	After storage 37°C	.370	3	.	.786	3	.082
	After storage 45°C	.292	3	.	.923	3	.463

a. Lilliefors Significance Correction

Appendix 9. Normality test results of iron content of fortified cookies

Iron	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	587884.250	3	195961.417	.402	.756
Within Groups	3901496.000	8	487687.000		
Total	4489380.250	11			

Appendix 10. ANOVA test results of iron content of fortified cookies

Multiple Comparisons

Dependent Variable: Iron						
Tukey HSD						
(I) Temp	(J) Temp	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Before storage	After storage 30°C	-150.00000	570.19704	.993	-1975.9716	1675.9716
	After storage 37°C	374.00000	570.19704	.911	-1451.9716	2199.9716
	After storage 45°C	-184.33333	570.19704	.987	-2010.3050	1641.6383
After storage 30°C	Before storage	150.00000	570.19704	.993	-1675.9716	1975.9716
	After storage 37°C	524.00000	570.19704	.796	-1301.9716	2349.9716
	After storage 45°C	-34.33333	570.19704	1.000	-1860.3050	1791.6383
After storage 37°C	Before storage	-374.00000	570.19704	.911	-2199.9716	1451.9716
	After storage 30°C	-524.00000	570.19704	.796	-2349.9716	1301.9716
	After storage 45°C	-558.33333	570.19704	.765	-2384.3050	1267.6383

After storage 45°C	Before storage	184.33333	570.19704	.987	-1641.6383	2010.3050
	After storage 30°C	34.33333	570.19704	1.000	-1791.6383	1860.3050
	After storage 37°C	558.33333	570.19704	.765	-1267.6383	2384.3050

Appendix 11. Tukey *post-hoc* test results of iron content (One-Way ANOVA)

Iron Retention						
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	104.222	2	52.111	.016	.984	
Within Groups	19074.000	6	3179.000			
Total	19178.222	8				

Appendix 12. ANOVA test results of iron retention of fortified cookies

Multiple Comparisons

Dependent Variable: Iron Retention						
Tukey HSD						
(I) Temp	(J) Temp	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
After storage 30°C	After storage 37°C	4.33333	46.03622	.995	-136.9184	145.5851
	After storage 45°C	-4.00000	46.03622	.996	-145.2518	137.2518
After storage 37°C	After storage 30°C	-4.33333	46.03622	.995	-145.5851	136.9184
	After storage 45°C	-8.33333	46.03622	.982	-149.5851	132.9184
After storage 45°C	After storage 30°C	4.00000	46.03622	.996	-137.2518	145.2518
	After storage 37°C	8.33333	46.03622	.982	-132.9184	149.5851

Appendix 13. Tukey *post-hoc* test results of iron retention (One-Way ANOVA)

The screenshot displays the Turnitin feedback studio interface. The main document area shows an abstract with a 9% similarity score. The match overview sidebar on the right lists seven sources, each with a similarity score of less than 1%. The interface includes a top navigation bar, a document editor, and a sidebar with various icons for navigation and settings.

ABSTRACT

Micronutrient deficiency is a major concern as it affects 50% of pregnant women in the world. Introduction to food fortification as the nutritional intervention program may aid in the prevention of micronutrient deficiencies, yet in order to accomplish the program's goals, the amount of nutrients fortified in the product must be sufficient and fulfilling. However, food products exposed to a variety of environmental conditions throughout storage may lose chemical and physical properties, leading to a change in the food's properties and nutrition. This study aimed to analyze the effect of storage temperature on the stability of micronutrients, physicochemical properties, and the shelf life estimation of fortified cookies. The fortified cookies were subjected to different storage temperatures of 30, 37, and 45°C for 1 month with all analyses done before and after; while shelf life was carried out every 6 days. The study showed that different storage temperatures significantly decreased the texture up to 156 N, which coincided with a significantly increased up to 5.57% and 0.62 in the moisture content and water activity, respectively. A slight fluctuation happened owing to crystalline sugar on the cookie surface. Iron results with 90-96% retentions presented that it did not appear to be influenced significantly by the storage temperature due to its characteristics that have high stability.

Match Overview

9%

- 1 collections.plymouth.a... <1% >
Internet Source
- 2 ejournal.undip.ac.id <1% >
Internet Source
- 3 link.springer.com <1% >
Internet Source
- 4 www.myfoodresearch... <1% >
Internet Source
- 5 W Cahyadi, Y Taufik, S ... <1% >
Publication
- 6 Submitted to University... <1% >
Student Paper
- 7 Denis Barclay. "Multiple... <1% >
Publication
- 8 Sri Hidayati, Dewi Sarti... <1% >

Page: 1 of 44 | Word Count: 15966 | Text-Only Report | High Resolution On

Appendix 14. Turnitin result