

DAFTAR PUSTAKA

- Aaslyng, M.D., Bejerholm, C., Ertbjerg, P., Bertram, H.C., and Andersen, H.J., 2003. Cooking loss and juiciness of pork in relation to raw meat quality and cooking procedure. *Food Quality and Preference*, 14 (4), 277–288.
- Abd, R.M., Nour, A.H., and Sulaiman, A.Z., 2014. Kinetic Stability and Rheology of Water-in-Crude Oil Emulsion Stabilized by Cocamide at Different Water Volume Fractions. *International Journal of Chemical Engineering and Applications*, 5 (2), 204–209.
- Abdel-Raouf, M.E., 2012. Factors Affecting the Stability of Crude Oil Emulsions. *In: Crude Oil Emulsions- Composition Stability and Characterization*. InTech, 183–204.
- Aberle, E.D., Forrest, J.C., Gerrard, D.E., and Mills, E.W., 2001. *Principles of Meat Science*. 4th ed. Iowa: Kendall Hunt Pub Co.
- Abeyrathne, E.D.N.S., Nam, K., and Ahn, D.U., 2021. Analytical Methods for Lipid Oxidation and Antioxidant Capacity in Food Systems. *Antioxidants*, 10 (10), 1587.
- Agustina, S., Oktarina, E., Aidha, N.N., and Hutomo, J., 2021. Antioxidant of Beta-Carotene Emulsion from Red Virgin Palm Oil (RVPO). *In: 4th International Seminar on Chemistry*. AIP Publishing.
- Agustinelli, S.P., Ciannamea, E.M., Ruseckaite, R.A., and Martucci, J.F., 2021. Migration of Red Grape Extract Components and Glycerol from Soybean Protein Concentrate Active Films into Food Aimulants. *Food Hydrocolloids*, 120, 106955.
- Akonor, P.T., Osei Tutu, C., Affrifah, N.S., Budu, A.S., and Saalia, F.K., 2023. Kinetics of β -Carotene Breakdown and Moisture Sorption Behavior of Yellow Cassava Flour during Storage. *Journal of Food Processing and Preservation*, 2023, 1–9.
- Akram, S., Mushtaq, M., and Waheed, A., 2021. β -Carotene: Beyond Provitamin A. *In: A Centum of Valuable Plant Bioactives*. Elsevier, 1–31.
- Aleena, K.S., Divya, M.P., Beena, A.K., Rachana, C.R., and Divya, K.B., 2020. Oxidative stability of sunflower oil on high temperature cooking. *The Pharma Innovation Journal*, 9 (10), 552–554.
- Ali, A.A.H., 2023. Overview of the vital roles of macro minerals in the human body. *Journal of Trace Elements and Minerals*, 4, 100076.

- Alongi, M., Lopriore, M., Calligaris, S., Manzocco, L., and Nicoli, M.C., 2023. Identifying the acceptability limit for shelf-life assessment of potato chips: Mismatching between quality and safety issues. *Journal of Food Engineering*, 357, 111645.
- Álvarez-Viñas, M., Souto, S., Flórez-Fernández, N., Torres, M.D., Bandín, I., and Domínguez, H., 2021. Antiviral Activity of Carrageenans and Processing Implications. *Marine Drugs*, 19 (8), 437.
- Amar, A., Makosim, S., Nurani, D., Eudia, L., and Fajrina, N., 2021. Pengaruh Variasi Waktu Homogenisasi dengan Ultra Turax dan Konsentrasi Susu Kedelai terhadap Mutu Susus Saga. *Jurnal Teknologi Industri Pertanian*, 31 (3), 283–295.
- An, J., Li, Y., Zhang, C., and Zhang, D., 2022. Rapid Nondestructive Prediction of Multiple Quality Attributes for Different Commercial Meat Cut Types Using Optical System. *Food Science of Animal Resources*, 42 (4), 655–671.
- AN, R., Pratamaningtyas, T.S., and Jumiono, A., 2022. Desain Kebijakan Pemasarana Sosis Daging Ayam Edible Casing Menuju Industri 4.0 dengan Menggunakan Interpretative Structural Modelling. *Jurnal GOVERNANSI*, 8 (1), 49–58.
- Anis, U., Millati, R., and Hidayat, C., 2022. Optimization of Crude Palm (*Elaeis guineensis*) Oil Bleaching using Zeolite-Fe by Response Surface Methodology. *agriTECH*, 42 (1), 23–29.
- AOAC, 2000. *Official Methods of Analysis of AOAC International*. 17th ed. Gaithersburg.
- AOAC, 2005. *Official Methods of Analysis*. 18th ed. Maryland: Association of Official Analytical Chemists International.
- Ashakayeva, R., Assenova, B., Tumenova, G., Nurgazezova, A., Zhumanova, G., Atambayeva, Z., Baikadamova, A., Il, D., and Dautova, A., 2022. A Pumpkin-Based Emulsion Gel as a Texture Improvement of Mixed Horsemeat Semi-Smoked Sausages. *Foods*, 11 (23), 3886.
- Ayala, A., Muñoz, M.F., and Argüelles, S., 2014. Lipid Peroxidation: Production, Metabolism, and Signaling Mechanisms of Malondialdehyde and 4-Hydroxy-2-Nonenal. *Oxidative Medicine and Cellular Longevity*, 2014, 1–31.
- Baer, A.A. and Dilger, A.C., 2014. Effect of fat quality on sausage processing, texture, and sensory characteristics. *Meat Science*, 96 (3), 1242–1249.

- Bañón, S., Díaz, P., Nieto, G., Castillo, M., and Álvarez, D., 2008. Modelling the yield and texture of comminuted pork products using color and temperature. Effect of fat/lean ratio and starch. *Meat Science*, 80 (3), 649–655.
- Barbut, S. and Marangoni, A., 2019. Organogels use in meat processing – Effects of fat/oil type and heating rate. *Meat Science*, 149, 9–13.
- Barrett, B., 2018. Viral Upper Respiratory Infection. *In: Integrative Medicine*. Elsevier, 170-179.e7.
- Bechoff, A., Chijioke, U., Tomlins, K.I., Govinden, P., Ilona, P., Westby, A., and Boy, E., 2015. Carotenoid stability during storage of yellow gari made from biofortified cassava or with palm oil. *Journal of Food Composition and Analysis*, 44, 36–44.
- BeMiller, J.N., 2019. *Carbohydrate Chemistry for Food Scientists*. 3rd ed. Elsevier.
- Bhangare, D., Rajput, N., Jadav, T., Sahu, A.K., Tekade, R.K., and Sengupta, P., 2022. Systematic strategies for degradation kinetic study of pharmaceuticals: an issue of utmost importance concerning current stability analysis practices. *Journal of Analytical Science and Technology*, 13 (1), 7.
- Biswas, A.K., Sahoo, J., and Chatli, M.K., 2011. A Simple UV-Vis Spectrophotometric Method for Determination of β -Carotene Content in Raw Carrot, Sweet Potato and Supplemented Chicken Meat Nuggets. *LWT - Food Science and Technology*, 44 (8), 1809–1813.
- Blackstock, J.C., 1989. The Physical Chemistry of Aqueous Systems. *In: Guide to Biochemistry*. Elsevier, 11–19.
- Bollinedi, H., Dhakane-Lad, J., Gopala Krishnan, S., Bhowmick, P.K., Prabhu, K.V., Singh, N.K., and Singh, A.K., 2019. Kinetics of β -carotene degradation under different storage conditions in transgenic Golden Rice® lines. *Food Chemistry*, 278, 773–779.
- Brilliantina, A., Wardani, D.K., Fadhila, P., Hariono, B., and Wijaya, R., 2022. Accelerated Shelf Life Test Method with Arrhenius Approach for Shelf Life Estimation of Tongkol ‘Euthynnus affinis’ Balado in Cans. *IOP Conference Series: Earth and Environmental Science*, 980 (1), 1–6.
- BSN, 2015. SNI Sosis Daging 3820:2015 [online]. *Standar Nasional Indonesia*.
- Carballo, J., 2021. Sausages: Nutrition, Safety, Processing and Quality Improvement. *Foods*, 10 (4), 890.

- Chaijan, M., Cheong, L.-Z., and Panpipat, W., 2021. Rice Bran Oil Emulgel as a Pork Back Fat Alternate for Semi-dried Fish Sausage. *PLoS ONE*, 16 (4).
- Chandra, M. V. and Shamasundar, B.A., 2015. Texture Profile Analysis and Functional Properties of Gelatin from the Skin of Three Species of Fresh Water Fish. *International Journal of Food Properties*, 18 (3), 572–584.
- Chen, H., Mao, L., Hou, Z., Yuan, F., and Gao, Y., 2020. Roles of Additional Emulsifiers in the Structures of Emulsion Gels and Stability of Vitamin E. *Food Hydrocolloids*, 99.
- Chen, J. and Rosenthal, A., 2015. *Modifying Food Texture*. Elsevier.
- Cheng, J., Sun, J., Yao, K., Xu, M., Tian, Y., and Dai, C., 2022. A decision fusion method based on hyperspectral imaging and electronic nose techniques for moisture content prediction in frozen-thawed pork. *LWT*, 165, 113778.
- Choe, E. and Min, D.B., 2007. Chemistry of Deep-Fat Frying Oils. *Journal of Food Science*, 72 (5), 77–86.
- Clark, S., 2007. Beta Carotene. In: *xPharm: The Comprehensive Pharmacology Reference*. Elsevier, 1–3.
- Cofrades, S., Hernández-Martín, M., Garcimartín, A., Saiz, A., López-Oliva, M.E., Benedí, J., and Álvarez, M.D., 2023. Impact of Silicon Addition on the Development of Gelled Pork Lard Emulsions with Controlled Lipid Digestibility for Application as Fat Replacers. *Gels*, 9 (9), 728.
- Corrêa, P.F., Silva, C.F. da, Ferreira, J.P., and Guerra, J.M.C., 2023. Vegetable-Based Frankfurter Sausage Production by Different Emulsion Gels and Assessment of Physical-Chemical, Microbiological and Nutritional Properties. *Food Chemistry Advances*, 3, 100354.
- Coscueta, E.R., Pellegrini Malpiedi, L., Pintado, M.M., and Nerli, B.B., 2023. Production of Soy Protein Concentrate with the Recovery of Bioactive Compounds: From Destruction to Valorization. *Food Hydrocolloids*, 137.
- Cruz-López, S.O., Álvarez-Cisneros, Y.M., Domínguez-Soberanes, J., Escalona-Buendía, H.B., and Sánchez, C.N., 2022. Physicochemical and Sensory Characteristics of Sausages Made with Grasshopper (*Sphenarium purpurascens*) Flour. *Foods*, 11 (5), 704.
- Cunningham, J., Nguyen, V., Adorno, P., and Droulez, V., 2015. Nutrient Composition of Retail Samples of Australian Beef Sausages. *Nutrients*, 7 (11), 9602–17.

- Delikanli, B. and Ozcan, T., 2017. Improving the Textural Properties of Yogurt Fortified with Milk Proteins. *Journal of Food Processing and Preservation*, 41 (5).
- Delisle, H., 2018. The Nutritional Value of Red Palm Oil. *In: Achieving Sustainable Cultivation of Oil Palm*. Quebec: Burleigh Dodds Science , 217–232.
- Demiray, E. and Tulek, Y., 2017. Degradation kinetics of β -carotene in carrot slices during convective drying. *International Journal of Food Properties*, 20 (1), 151–156.
- Dhal, S., Pal, A., Gramza-Michalowska, A., Kim, D., Mohanty, B., Sagiri, S.S., and Pal, K., 2023. Formulation and Characterization of Emulgel-Based Jelly Candy: A Preliminary Study on Nutraceutical Delivery. *Gels*, 9 (6), 466.
- Ding, D., 2021. Effects of Emulsifier on Emulsification, Physical and Chemical Properties of Soybean Protein. *IOP Conference Series: Earth and Environmental Science*, 792 (1), 1–9.
- Domínguez, R., Pateiro, M., Gagaoua, M., Barba, F.J., Zhang, W., and Lorenzo, J.M., 2019. A Comprehensive Review on Lipid Oxidation in Meat and Meat Products. *Antioxidants*, 8 (10), 429.
- Dreher, J., König, M., Herrmann, K., Terjung, N., Gibis, M., and Weiss, J., 2021. Varying the amount of solid fat in animal fat mimetics for plant-based salami analogues influences texture, appearance and sensory characteristics. *LWT*, 143, 111140.
- Drulyte, D. and Orlie, V., 2019. The Effect of Processing on Digestion of Legume Proteins. *Foods*, 8 (6), 224.
- Dul, M., Paluch, K.J., Kelly, H., Healy, A.M., Sasse, A., and Tajber, L., 2015. Self-Assembled Carrageenan/Protamine Polyelectrolyte Nanoplexes—Investigation of Critical Parameters Governing Their Formation and Characteristics. *Carbohydrate Polymers*, 123, 339–349.
- Elbakheet, I.S., Elgasim, A.E., and Algadi, M.Z., 2017. Proximate Composition of Beef Sausage Processed by Wheat Germ Flour. *Journal of Food Processing & Technology*, 8 (11).
- FDA, 2023. Food Additive Status List [online]. *FDA*. Available from: <https://www.fda.gov/food/food-additives-petitions/food-additive-status-list> [Accessed 4 Mar 2024].
- Feiner, G., 2016. Additives. *In: Salami*. Elsevier, 59–88.

- Feng, C.-H. and Arai, H., 2023. Estimating Moisture Content of Sausages with Different Types of Casings via Hyperspectral Imaging in Tandem with Multivariate. *Applied Sciences*, 13 (9), 5300.
- Fernández, C.L., Fogar, R.A., Rolhaiser, F.A., and Romero, M.C., 2023. Functional gels from bovine blood proteins as fat substitutes and potential carriers of heme iron. *Innovative Food Science & Emerging Technologies*, 87, 103389.
- Firdaus, M., Nurdiani, R., Awaludin Prihanto, A., Puji Lestari, E., Suyono, and Amam, F., 2021. Carrageenan characteristics of *Kappaphycus alvarezii* from various harvest ages. *IOP Conference Series: Earth and Environmental Science*, 860 (1), 012067.
- Fitri, I.A. and Winuprasith, T., 2022. Stability β -carotene encapsulated in plant-based emulsions: impact of nanocrystalline cellulose concentration. *Bioscience*, 6 (1), 01.
- Gao, Z., Zhu, Y., Jin, J., Jin, Q., and Wang, X., 2023. Chemical–Physical Properties of Red Palm Oils and Their Application in the Manufacture of Aerated Emulsions with Improved Whipping Capabilities. *Foods*, 12 (21), 1–17.
- Geng, L., Liu, K., and Zhang, H., 2023. Lipid Oxidation in Foods and its Implications on Proteins. *Frontiers in Nutrition*, 10.
- Goindi, S., Kaur, A., Kaur, R., Kalra, A., and Chauhan, P., 2016. Nanoemulsions: an Emerging Technology in the Food Industry. In: *Emulsions*. Elsevier, 651–688.
- Gordon, M.H., 2001. Measuring antioxidant activity. In: *Antioxidants in Food*. Elsevier, 71–84.
- Gordon, M.H., 2004. Factors affecting lipid oxidation. In: *Understanding and Measuring the Shelf-Life of Food*. Elsevier, 128–141.
- Grambow, C.A., Pattanaik, L., and Green, W.H., 2020. Deep Learning of Activation Energies. *The Journal of Physical Chemistry Letters*, 11 (8), 2992–2997.
- Grune, T., Lietz, G., Palou, A., Ross, A.C., Stahl, W., Tang, G., Thurnham, D., Yin, S., and Biesalski, H.K., 2010. β -Carotene Is an Important Vitamin A Source for Humans. *The Journal of Nutrition*, 140 (12), 2268S–2285S.
- Guan, X., Zhong, X., Lu, Y., Du, X., Jia, R., Li, H., and Zhang, M., 2021. Changes of Soybean Protein during Tofu Processing. *Foods*, 10 (7), 1594.
- Gumus, C.E. and Decker, E.A., 2021. Oxidation in Low Moisture Foods as a Function of Surface Lipids and Fat Content. *Foods*, 10 (4), 860.

- Habiba, U., Hossain, M., Habib, M., Hashem, M., and Ali, M., 2021. Effect of Adding Different Types of Flour on the Quality of Low Fat Beef Sausage. *Bangladesh Journal of Animal Science*, 50 (1), 1–11.
- Hasanpour, F., Hoseini, E., Motalebi, A.A., and Darvish, F., 2012. Effects of Soy Protein Concentrate and Xanthan Gum on Physical Properties of Silver Carp (*Hypophthalmichthys molitrix*) Surimi. *Iranian Journal of Fisheries Sciences*, 11 (3), 518–530.
- Hastarini, E., Nabilla, M., Permadi, A., Adi, C.P., and Nurbayasari, R., 2021. Characteristic of margarine with ingredient mixed of catfish (*Pangasius* sp.) oil and vegetable oil. *IOP Conference Series: Earth and Environmental Science*, 919 (1), 012043.
- Heikal, Y.A.R., Hassan, A.A., Abou-Arab, A.A., Abu-Salem, F.M., and Azab, D.E.-S.H., 2023. Nano Formulated Soy Proteins as a Fat Replacer in Low Fat Mayonnaise Formula. *Journal of the Saudi Society of Agricultural Sciences*, 22 (7), 469–479.
- Hernani, N., Mulyono, E., and Ramadhan, K., 2016. Pemanfaatan Monodiasilgliserol (MDAG) Hasil Sintesa dari utter Biji Pala dan Gliserol sebagai Emulsifier pada Kualitas Produk Sosis Ayam. *Jurnal Penelitian Pascapanen Pertanian*, 13 (2), 74–81.
- Hough, G., 2010. *Sensory Shelf Life Estimation of Food Products*. Boca Raton: CRC Press.
- Ikeura, H., Kobayashi, F., Kai, T., Tsuchiya, Y., and Tamaki, M., 2023. Effects of different storage conditions on the colour, antioxidant activity, and volatile components of edible roses. *Scientia Horticulturae*, 310, 111707.
- Ishiwatari, N., Fukuoka, M., and Sakai, N., 2013. Effect of protein denaturation degree on texture and water state of cooked meat. *Journal of Food Engineering*, 117 (3), 361–369.
- Ismail, B.P., 2017. Ash Content Determination. 117–119.
- Iswoyo, Sumarmono, J., and Setyawardani, T., 2023. Physical Characteristics of Emulsion-Type Sausage from Lamb Meat with Varying Fat Levels. *IOP Conference Series: Earth and Environmental Science*, 1177 (1), 012034.
- Ito, A., Sato, Y., and Kudo, S., 2003. The Screening of Hydrogen Peroxide-Producing Lactic Acid Bacteria and Their Application to Inactivating Psychrotrophic Food-Borne Pathogens. *Current Microbiology*, 47 (3), 231–236.

- Iwansyah, A.C., Melanie, D., Cahyadi, W., Indraningsih, A.W., Khasanah, Y., Indriati, A., Andriansyah, R.C.E., Hamid, H.A., and Yahya, I.H., 2022. Shelf life evaluation of formulated cookies from Hanjeli (*Coix lacryma-jobi* L.) and Moringa leaf flour (*Moringa oleifera*). *Food Bioscience*, 47, 101787.
- Jankowiak, H., Cebulska, A., and Bocian, M., 2021. The relationship between acidification (pH) and meat quality traits of polish white breed pigs. *European Food Research and Technology*, 247 (11), 2813–2820.
- Jeyakodi, S., Krishnakumar, A., and Chellappan, D.K., 2018. Beta Carotene-Therapeutic Potential and Strategies to Enhance Its Bioavailability. *Nutri Food Sci Int J*, 7 (4), 1–7.
- Jhawat, V., Gulia, M., and Sharma, A.K., 2021. Pseudoternary Phase Diagrams Used in Emulsion Preparation. In: *Chemoinformatics and Bioinformatics in the Pharmaceutical Sciences*. Elsevier, 455–481.
- Jouki, M., Rabbani, M., and Shakouri, M.J., 2020. Effects of pectin and tomato paste as a natural antioxidant on inhibition of lipid oxidation and production of functional chicken breast sausage. *Food Science and Technology*, 40 (suppl 2), 521–527.
- Jusman, Syamsuddin, and Handayani, S., 2023. Characterization Red Palm Oil (RPO) Olein Fraction Via Distillation Vacuum. *Rafflesia Journal of Natural and Applied Sciences*, 3 (1), 190–193.
- Kavya, M., Ranjit Jacob, A., and Nisha, P., 2023. Pectin Emulsions and Emulgels: Bridging the Correlation Between Rheology and Microstructure. *Food Hydrocolloids*, 143, 1–12.
- Ketaren, S., 1986. *Pengantar Teknologi Lemak dan Minyak Pangan*. Jakarta: UI Press.
- Knockaert, G., Lemmens, L., Van Buggenhout, S., Hendrickx, M., and Van Loey, A., 2015. Changes in β -Carotene During Processing of Carrots. In: *Processing and Impact on Active Components in Food*. Elsevier, 11–16.
- Kodra, M., Devolli, A., Feta, D., Stafasani, M., and Shanisasi, E., 2020. Evaluation of Total Protein and Moisture Content in Processed Meat (Sausages) of Tirana Markets. *Journal of Hygienic Engineering and Design*, 27–31.
- Kong, F. and Singh, R.P., 2011. Advances in instrumental methods to determine food quality deterioration. In: *Food and Beverage Stability and Shelf Life*. Elsevier, 381–404.

- Korkeala, H.J. and Björkroth, K.J., 1997. Microbiological Spoilage and Contamination of Vacuum-Packaged Cooked Sausages. *Journal of Food Protection*, 60 (6), 724–731.
- Kramlich, R. V, 1971. *Sausage Product*. San Fransisco: W. H. Freeman and Company.
- Kukuruzović, J., Matin, A., Kontek, M., Krička, T., Matin, B., Brandić, I., and Antonović, A., 2023. The Effects of Demineralization on Reducing Ash Content in Corn and Soy Biomass with the Goal of Increasing Biofuel Quality. *Energies*, 16 (2), 967.
- Kulkarni, V.S. and Shaw, C., 2016. Use of Polymers and Thickeners in Semisolid and Liquid Formulations. In: *Essential Chemistry for Formulators of Semisolid and Liquid Dosages*. Elsevier, 43–69.
- Labuza, T.P., 1982. *Open Shelf-Life Dating of Foods*. Wetsport: Food & Nutrition Press.
- Lau, C.S., Fulgoni, V.L., Van Elswyk, M.E., and McNeill, S.H., 2023. Trends in Beef Intake in the United States: Analysis of the National Health and Nutrition Examination Survey, 2001–2018. *Nutrients*, 15 (11).
- Lawrie, R.A. and Ledward, D.A., 2006. *Meat Science*. 7th ed. CRC Press.
- Le, T.K.Y., Tac, D.N.T., and Hoang, K.A., 2023. Fat-Reduced Sausage Supplemented with Germinated Mung Beans: Physicochemical Properties and Sensory Acceptance. *Chemical Engineering Transactions*, 106, 895–900.
- Lecca, P., 2013. Stochastic chemical kinetics. *Biophysical Reviews*, 5 (4), 323–345.
- Lee, W.J., Tan, C.P., Sulaiman, R., Smith, R.L., and Chong, G.H., 2018. Microencapsulation of Red Palm Oil as an Oil-in-Water Emulsion with Supercritical Carbon Dioxide Solution-Enhanced Dispersion. *Journal of Food Engineering*, 222, 100–109.
- Lee, N., Kwak, H. S., Joo, J., Kang, J., & Lee, Y. 2018., Effects of Partial Replacement of Pork Meat with Chicken or Duck Meat on the Texture, Flavor, and Consumer Acceptance of Sausage. *Journal of Food Quality*, 2018, 1–9.
- Li, A., Gong, T., Li, X., Li, X., Yang, X., and Guo, Y., 2020. Preparation of Thermally Stable Emulsion Gels Based on Glucono- δ -Lactone Induced Gelation of Gellan Gum. *International Journal of Biological Macromolecules*, 156, 565–575.

- Li, C., Xie, W., Zhang, X., Liu, J., Zhang, M., and Shao, J., 2023. Pickering Emulsion Stabilized by Modified Pea Protein-Chitosan Composite Particles as a New Fat Substitute Improves the Quality of Pork Sausages. *Meat Science*, 197, 109086.
- Li, Y., Ding, S., and Wang, Y., 2022. Shelf Life Predictive Model for Postharvest Shiitake Mushrooms. *Journal of Food Engineering*, 330, 111099.
- Lim, W.S., Lim, N., Kim, H.W., and Park, H.J., 2023. Effect of Emulsion Gel as Butter Substitute on the Dimensional Stability and Nutritional Profile of 3D Printed Cookies. *Food Bioscience*, 56, 103207.
- Lin, D., Kelly, A.L., and Miao, S., 2020. Preparation, Structure-Property Relationships and Applications of Different Emulsion Gels: Bulk Emulsion Gels, Emulsion Gel Particles, and Fluid Emulsion Gels. *Trends in Food Science & Technology*, 102, 123–137.
- Liu, D., Zhou, P., and Nicolai, T., 2020. Effect of Kappa carrageenan on acid-induced gelation of whey protein aggregates. Part I: Potentiometric titration, rheology and turbidity. *Food Hydrocolloids*, 102, 105589.
- Liu, K., Liu, Y., and Chen, F., 2019. Effect of storage temperature on lipid oxidation and changes in nutrient contents in peanuts. *Food Science & Nutrition*, 7 (7), 2280–2290.
- Lonergan, Topel, D.G., and Marple, D.N., 2019. *The Science of Animal Growth and Meat Technology*. 2nd ed. Elsevier.
- Lu, Y., Mao, L., Zheng, H., Chen, H., and Gao, Y., 2020. Characterization of β -carotene Loaded Emulsion Gels Containing Denatured and Native Whey Protein. *Food Hydrocolloids*, 102, 105600.
- Magari, R.T., Munoz-Antoni, I., Baker, J., and Flagler, D.J., 2004. Determining shelf life by comparing degradations at elevated temperatures. *Journal of Clinical Laboratory Analysis*, 18 (3), 159–164.
- Mao, C., Lei, G., Horbath, A., and Gan, B., 2022. Assessment of Lipid Peroxidation in Irradiated Cells. In: *Methods in Cell Biology*. Elsevier, 37–50.
- Mao, L., Wang, W., Tai, K., Yuan, F., and Gao, Y., 2017. Development of a soy protein isolate–carrageenan–quercetagenin non-covalent complex for the stabilization of β -carotene emulsions. *Food & Function*, 8 (12), 4356–4363.
- Maoka, T., 2020. Carotenoids as Natural Functional Pigments. *Journal of Natural Medicines*, 74 (1), 1–16.

- Marangoni Júnior, L., Ito, D., Ribeiro, S.M.L., Silva, M.G. da, and Alves, R.M.V., 2018. Stability of β -carotene rich sweet potato chips packed in different packaging systems. *LWT*, 92, 442–450.
- Marcus, J.B., 2013. Lipids Basics: Fats and Oils in Foods and Health. *In: Culinary Nutrition*. Elsevier, 231–277.
- Marie Viet, S., S.A. Heikkinen, M., and Dellarco, M., 2021. Considerations for Stability of Environmental Samples in Storage for Long-Term Studies. *In: Analytical Chemistry - Advancement, Perspectives and Applications*. IntechOpen.
- Marliyati, S.A., Rimbawan, and Harianti, R., 2021. Karakteristik Fisikokimia dan Fungsional Minyak Sawit Merah. *JGMI: The Journal of Indonesian Community Nutrition*, 10 (1), 83–94.
- Mehnath, S., Das, A.K., Verma, S.K., and Jeyaraj, M., 2021. Biosynthesized/Green-Synthesized Nanomaterials as Potential Vehicles for Delivery of Antibiotics/Drugs. *In: Comprehensive Analytical Chemistry*. Elsevier, 363–432.
- Meijaard, E., Abrams, J.F., Slavin, J.L., and Sheil, D., 2022. Dietary Fats, Human Nutrition and the Environment: Balance and Sustainability. *Frontiers in Nutrition*, 9.
- Melton, L., Shahidi, F., and Varelis, P., 2019. *Encyclopedia of Food Chemistry*. Elsevier.
- Mensink, G.B.M., Fletcher, R., Gurinovic, M., Huybrechts, I., Lafay, L., Serra-Majem, L., Szponar, L., Tetens, I., Verkaik-Kloosterman, J., Baka, A., and Stephen, A.M., 2013. Mapping Low Intake of Micronutrients Across Europe. *British Journal of Nutrition*, 110 (4), 755–773.
- Milutinov, J., Krstonošić, V., Ćirin, D., and Pavlović, N., 2023. Emulgels: Promising Carrier Systems for Food Ingredients and Drugs. *Polymers*, 15 (10), 2302.
- Minaker, S.A., Mason, R.H., and Chow, D.R., 2021. Optimizing Color Performance of the Ngenuity 3-Dimensional Visualization System. *Ophthalmology Science*, 1 (3), 100054.
- Mitrea, L., Teleky, B.-E., Leopold, L.-F., Nemes, S.-A., Plamada, D., Dulf, F.V., Pop, I.-D., and Vodnar, D.C., 2022. The physicochemical properties of five vegetable oils exposed at high temperature for a short-time-interval. *Journal of Food Composition and Analysis*, 106, 104305.

- Mizrahi, S., 2011. Accelerated Shelf Life Testing of Foods. *In: Food and Beverage Stability and Shelf Life*. Elsevier, 482–506.
- Mordi, R.C., Ademosun, O.T., Ajanaku, C.O., Olanrewaju, I.O., and Walton, J.C., 2020. Free Radical Mediated Oxidative Degradation of Carotenes and Xanthophylls. *Molecules*, 25 (5), 1038.
- Mousavi, M., Heshmati, A., Daraei Garmakhany, A., Vahidinia, A., and Taheri, M., 2019. Texture and sensory characterization of functional yogurt supplemented with flaxseed during cold storage. *Food Science & Nutrition*, 7 (3), 907–917.
- Mu, T.-H., Zhang, M., Sun, H.-N., and Pérez, I.C., 2019. Sweet Potato Staple Foods. *In: Sweet Potato*. Elsevier, 273–302.
- Murphy, R.Y. and Marks, B.P., 2000. Effect of meat temperature on proteins, texture, and cook loss for ground chicken breast patties. *Poultry Science*, 79 (1), 99–104.
- Nasirpour-Tabrizi, P., Azadmard-Damirchi, S., Hesari, J., Khakbaz Heshmati, M., and Savage, G.P., 2020. Rheological and Physicochemical Properties of Novel Low-fat Emulgels Containing Flaxseed Oil as a Rich Source of ω -3 Fatty Acids. *LWT*, 133.
- Nikolaou, C.K., Hankey, C.R., and Lean, M.E.J., 2016. Effects of calorie labelling on macro- and micro-nutrients in main-meal choices made by young adults. *European Journal of Clinical Nutrition*, 70 (3), 386–392.
- Nkekesi, B., Amenya, P., Aboagye, G., and Kortei, N.K., 2023. Street-vended grilled beef sausages as potential vehicles of bacterial and fungal pathogens: An exploratory survey in Ho, the capital city of the Volta Region of Ghana. *Food Science & Nutrition*, 11 (11), 7013–7025.
- Normah, I. and Syuhadah, N., 2019. Comparative study on the physicochemical characteristics of chicken sausage incorporated with sutchi catfish (*Pangasius hypophthalmus*) gelatin, carrageenan and pectin. *Food Research*, 3 (5), 477–483.
- Nour, A.H., Rosli, Yunus, M., and Jemaat, Z., 2006. Study on Demulsification of Water-in-Oil Emulsions Via Microwave Heating Technology. *Journal of Applied Sciences*, 6 (9), 2060–2066.
- Nuhriawangsa, A.M.P., Swastike, W., Hertanto, B.S., Hanifa, A., and Kartikasari, L.R., 2023. Physical Quality of Beef Sausage Using Porang Flour as a Substitute for Tapioca Flour. *IOP Conference Series: Earth and Environmental Science*, 1200 (1), 012024.

- Nwajinka, C.O., Okonjo, E.O., Amaefule, D.O., and Okpala, D.C., 2020. Effects of microwave power and slice thickness on fiber and ash contents of dried sweet potato (*Ipomoea batata*). *Nigerian Journal of Technology*, 39 (3).
- Onsaard, E., Vittayanont, M., Srigam, S., and McClements, D.J., 2006. Comparison of Properties of Oil-in-Water Emulsions Stabilized by Coconut Cream Proteins with Those Stabilized by Whey Protein Isolate. *Food Research International*, 39 (1), 78–86.
- Oppong, D., Panpipat, W., Cheong, L.-Z., and Chaijan, M., 2022. Rice Flour-Emulgel as a Bifunctional Ingredient, Stabiliser-Cryoprotactant, for Formulation of Healthier Frozen Fish Nugget. *LWT*, 159, 113241.
- Paglarini, C. de S., Martini, S., and Pollonio, M.A.R., 2019. Using emulsion gels made with sonicated soy protein isolate dispersions to replace fat in frankfurters. *LWT*, 99, 453–459.
- Pang, B., Bowker, B., Zhuang, H., Yang, Y., and Zhang, J., 2020. Research Note: Comparison of 3 methods used for estimating cook loss in broiler breast meat. *Poultry Science*, 99 (11), 6287–6290.
- Pargiyanti, 2019. Optimasi Waktu Ekstraksi Lemak dengan Metode Soxhlet Menggunakan Perangkat Alat Mikro Soxhlet. *Indonesian Journal of Laboratory*, 1 (2), 29–35.
- Park, J.-W., Lee, S., Yoo, B., and Nam, K., 2020. Effects of texture properties of semi-solid food on the sensory test for pharyngeal swallowing effort in the older adults. *BMC Geriatrics*, 20 (1), 493.
- Peng, Y., Kyriakopoulou, K., Ndiaye, M., Bianeis, M., Keppler, J.K., and van der Goot, A.J., 2021. Characteristics of Soy Protein Prepared Using an Aqueous Ethanol Washing Process. *Foods*, 10 (9), 2222.
- Pipoyan, D., Stepanyan, S., Stepanyan, S., Beglaryan, M., Costantini, L., Molinari, R., and Merendino, N., 2021. The Effect of Trans Fatty Acids on Human Health: Regulation and Consumption Patterns. *Foods*, 10 (10), 2452.
- Poyato, C., Astiasarán, I., Barriuso, B., and Ansorena, D., 2015. A New Polyunsaturated Gelled Emulsion as Replacer of Pork Back-Fat in Burger Patties: Effect on Lipid Composition, Oxidative Stability and Sensory Acceptability. *LWT - Food Science and Technology*, 62 (2), 1069–1075.
- Praptiningsih, Y., Tamrini, and Rahma, A., 2013. Karakteristik es krim susu kacang tunggak (*Vigna unguiculata* L.) dengan variasi jumlah karagenan dan whipping cream. *J. Agroteknologi*, 7 (2), 150–156.

- Pratama, Y., Abduh, S.B.M., Legowo, A.M., Pramono, Y.B., and Albaarri, A., 2018. Optimum carrageenan concentration improved the physical properties of cabinet-dried yoghurt powder. *IOP Conference Series: Earth and Environmental Science*, 102, 012023.
- Pratistha, I.N.A., 2023. Pengaruh Konsentrasi Minyak Sawit Merah dan Metode Pembentukan Gel Pada Sifat Fisikokimia Emulsion Gel Berbasis Protein Kedelai-Karagenan Pada Sosis Sapi. Universitas Gadjah Mada, Yogyakarta.
- Purnamayati, L., Anandito, R.B.K., Siswanti, S., and Nurhartadi, E., 2019. Characteristic and Self-Life Test of Food Bar with Combination of White Millet, Snakehead Fish and Soy Flour. *Caraka Tani: Journal of Sustainable Agriculture*, 34 (1), 101.
- Purslow, P.P., Oiseth, S., Hughes, J., and Warner, R.D., 2016. The structural basis of cooking loss in beef: Variations with temperature and ageing. *Food Research International*, 89, 739–748.
- Rahmadani, R., Bastian, F., and Tawali, A., 2023. Determination of Shelf Life of Snakehead Fish Dispersion Products (*Channa striata*) Using the ASLT Method With Arrhenius Model. *IOP Conference Series: Earth and Environmental Science*, 1182 (1), 012057.
- Ramdath, D.D., Lu, Z.-H., Maharaj, P.L., Winberg, J., Brummer, Y., and Hawke, A., 2020. Proximate Analysis and Nutritional Evaluation of Twenty Canadian Lentils by Principal Component and Cluster Analyses. *Foods*, 9 (2), 175.
- Ren, Y., Huang, L., Zhang, Y., Li, H., Zhao, D., Cao, J., and Liu, X., 2022. Application of Emulsion Gels as Fat Substitutes in Meat Products. *Foods*, 11 (13), 1950.
- Renzo, L. Di, Gualtieri, P., and De Lorenzo, A., 2021. Diet, Nutrition and Chronic Degenerative Diseases. *Nutrients*, 13 (4).
- Rey, F., Alves, E., Gaspar, L., Conceição, M., and Domingues, M.R., 2023. Oils as a Source of Bioactive Lipids (Olive Oil, Palm Oil, Fish Oil). In: *Bioactive Lipids*. Elsevier, 231–268.
- Rongrong, L., Carpenter, J.A., and Cheney, R., 1998. Sensory and instrumental properties of smoked sausage made with technically separated poultry (MSP) meat and wheat protein. *Journal of Food Science*, 63, 923–929.
- Rosmawati, Tawali, A.B., Said, M.I., Sari, S.F., Anwar, L.O., Nurdin, I.N., Said, A., Tamtama, A., Auza, F.A., Zzaman, W., Jeinie, M.H., Rahman, M.N.A., and Huda, N., 2023. Characteristics of the Beef Cheek Meat-Based Sausage Added

- with Snakehead (*Channa striata*) Gelatin. *International Journal of Food Science*, 2023, 1–13.
- Safrina, D. and Lestari, P., 2021. Pendugaan Umur Simpan Metode Extend Storage Studies dan Pengaruh Lama Penyimpanan terhadap Organoleptik *Simplisia Mentha x piperita* L. *Jurnal Teknologi & Industri Pertanian*, 26 (2), 115–122.
- Sakowski, T., Grodkowski, G., Gołbiewski, M., Slószarz, J., Kostusiak, P., Solarczyk, P., and Puppel, K., 2022. Genetic and Environmental Determinants of Beef Quality—A Review. *Frontiers in Veterinary Science*, 9.
- Santos, J.M. dos, Ignácio, E.O., Bis-Souza, C.V., and Silva-Barretto, A.C. da, 2021. Performance of Reduced Fat-Reduced Salt Fermented Sausage with Added Microcrystalline Cellulose, Resistant Starch and Oat Fiber Using the Simplex Design. *Meat Science*, 175.
- Sanvictores, T. and Farci, F., 2024. *Biochemistry, Primary Protein Structure*.
- Sarpong, F., Zhou, C., Bai, J., Amenorfe, L.P., Golly, M.K., and Ma, H., 2019. Modeling of drying and ameliorative effects of relatif humidity (RH) against β -carotene degradation and color of carrot (*Daucus carota* var.) slices. *Food Science and Biotechnology*, 28 (1), 75–85.
- Setyaningsih, D., Siregar, M.S., Pasaribu, P.Y., and Muna, N., 2023. Formulation of Palm Oil Based Fat Replacer and Its Application on Meat Analogue. *IOP Conference Series: Earth and Environmental Science*, 1187 (1), 012001.
- Sibuea, P., Rahardjo, S., Santoso, U., and Noor, Z., 2004. Oksidasi Minyak dalam Emulsi O/W : Mekanisme dan Pengendaliannya. *Agritech: Jurnal Fakultas Teknologi Pertanian UGM*, 24 (4), 210–216.
- Silva, K.C.G., Feltre, G., Dupas Hubinger, M., and Kawazoe Sato, A.C., 2021. Protection and targeted delivery of β -carotene by starch-alginate-gelatin emulsion-filled hydrogels. *Journal of Food Engineering*, 290, 110205.
- Singh, P., Kulshrestha, K., and Kumar, S., 2013. Effect of storage on β -carotene content and microbial quality of dehydrated carrot products. *Food Bioscience*, 2, 39–45.
- Singh, T.K. and Cadwallader, K.R., 2002. The Shelf Life of Foods: An Overview. *In: Food Science and Human Nutrition*. Washington: ACS Symposium Series, 2–21.
- Søltoft-Jensen, J. and Hansen, F., 2005. New Chemical and Biochemical Hurdles. *In: Emerging Technologies for Food Processing*. Elsevier, 387–416.

- Song, X., Song, Z., Liu, B., Guo, Z., and Luan, Y., 2020. Effect of Vacuum Cooling on Stability of Macro-Porous Sausage during Refrigerated Storage—Vacuum-Cooled Sausage has a Longer Shelf Life. *Food Science & Nutrition*, 8 (5), 2223–2233.
- Subramaniam, P.J., 2009. Shelf-Life Prediction and Testing. *In: Science and Technology of Enrobed and Filled Chocolate, Confectionery and Bakery Products*. Elsevier, 233–254.
- Sullivan, A.P. and Kilpatrick, P.K., 2002. The Effects of Inorganic Solid Particles on Water and Crude Oil Emulsion Stability. *Industrial & Engineering Chemistry Research*, 41 (14), 3389–3404.
- Suryanti, S., Marseno, D.W., Indrati, R., and Irianto, H.E., 2018. Pengaruh Jenis Asam dalam Isolasi Gelatin dari Kulit Ikan Nila (*Oreochromis niloticus*) terhadap Karakteristik Emulsi. *Agritech*, 37 (4), 410.
- Tan, C.H., Lee, C.J., Tan, S.N., Poon, D.T.S., Chong, C.Y.E., and Pui, L.P., 2021. Red Palm Oil: A Review on Processing, Health Benefits and Its Application in Food. *Journal of Oleo Science*, 70 (9), 1201–1210.
- Tarigan, M.M.B., Wibowo, A., and Ardhani, F., 2020. Pengamatan Perubahan Sifat Fisik Otot Semitendinosus Sapi Pasca Penyembelihan Selama Masa Simpan Dingin. *Jurnal Peternakan Lingkungan Tropis*, 3 (2), 84–93.
- Teitelbaum, D.H. and Coran, A.G., 2006. Nutritional Support. *In: Pediatric Surgery*. Elsevier, 194–220.
- Torrieri, E., 2016. Storage Stability: Shelf Life Testing. *In: Encyclopedia of Food and Health*. Elsevier, 188–192.
- Ulu, H., 2006. Effects of carrageenan and guar gum on the cooking and textual properties of low fat meatballs. *Food Chemistry*, 95 (4), 600–605.
- Vasquez Mejia, S.M., de Francisco, A., and Bohrer, B.M., 2019. Replacing starch in beef emulsion models with β -glucan, microcrystalline cellulose, or a combination of β -glucan and microcrystalline cellulose. *Meat Science*, 153, 58–65.
- Wahyuni, S., Holilah, Asranudin, and Noviyanti, 2018. Estimation of shelf life of wikau maombo brownies cake using Accelerated Shelf Life Testing (ASLT) method with Arrhenius model. *IOP Conference Series: Earth and Environmental Science*, 122, 012082.

- Wang, D., Xiao, H., Lyu, X., Chen, H., and Wei, F., 2023. Lipid Oxidation in Food Science and Nutritional Health: A Comprehensive Review. *Oil Crop Science*, 8 (1), 35–44.
- Webb, E.C., 2021. Cis/Trans-Fatty Acid Content of Red Meats and the Related Effects on Meat Quality and Human Health. In: C.L. Ranabhat, ed. *Meat and Nutrition*. IntechOpen.
- Webber, V., Carvalho, S.M. de, Ogliari, P.J., Hayashi, L., and Barreto, P.L.M., 2012. Optimization of the extraction of carrageenan from *Kappaphycus alvarezii* using response surface methodology. *Food Science and Technology*, 32 (4), 812–818.
- Węglarz, A., 2010. Meat quality defined based on pH and colour depending on cattle category and slaughter season. *Czech J. Anim. Sci.*, 55 (12), 548–556.
- Weyh, C., Krüger, K., Peeling, P., and Castell, L., 2022. The Role of Minerals in the Optimal Functioning of the Immune System. *Nutrients*, 14 (3), 644.
- WHO, 2023. WHO updates guidelines on fats and carbohydrates [online]. *WHO*. Available from: <https://www.who.int/news/item/17-07-2023-who-updates-guidelines-on-fats-and-carbohydrates#:~:text=With%20its%20guidance%20on%20dietary,total%20energy%20intake%20or%20less> [Accessed 4 Mar 2024].
- Williams, C. and Buttriss, J., 2006. *Improving the Fat Content of Foods*. Woodhead Publishing.
- Windarsih, A., Bakar, N.K.A., Dachriyanus, Yuliana, N.D., Riswanto, F.D.O., and Rohman, A., 2023. Analysis of Pork in Beef Sausages Using LC-Orbitrap HRMS Untargeted Metabolomics Combined with Chemometrics for Halal Authentication Study. *Molecules*, 28 (16), 5964.
- Xu, X., Jiang, F., Lin, K., Fang, J., Chen, F., Ru, Y., Weng, H., Xiao, Q., Yang, Q., and Xiao, A., 2024. Anhydride esterification to regulate water migration and reduce ice crystal formation in κ -carrageenan gel during freezing. *Food Hydrocolloids*, 150, 109726.
- Yim, D.-G., Jang, K.-H., and Chung, K.-Y., 2015. Effect of Fat Level and the Ripening Time on Quality Traits of Fermented Sausages. *Asian-Australasian Journal of Animal Sciences*, 29 (1), 119–125.
- Yiu, C.C.-Y., Liang, S.W., Mukhtar, K., Kim, W., Wang, Y., and Selomulya, C., 2023. Food Emulsion Gels from Plant-Based Ingredients: Formulation, Processing, and Potential Applications. *Gels*, 9 (5), 366.

- Yudhananda, M.B.P., 2023. Pengaruh Konsentrasi dan Ratio Protein Kedelai-Karagenan Terhadap Sifat Fisikokimia Emulsi Gel Minyak Sawit Merah pada Sosis Sapi. Universitas Gadjah Mada, Yogyakarta.
- Zhang, M., Yang, Y., and Acevedo, N. C., 2020. Effect of Oil Content and Composition on the Gelling Properties of Egg-SPI Proteins Stabilized Emulsion Gels. *Food Biophysics*.
- Zhang, X., Chen, X., Gong, Y., Li, Z., Guo, Y., Yu, D., and Pan, M., 2021. Emulsion gels stabilized by soybean protein isolate and pectin: Effects of high intensity ultrasound on the gel properties, stability and β -carotene digestive characteristics. *Ultrasonics Sonochemistry*, 79, 105756.
- Zhang, X., Wang, Q., Liu, Z., Zhi, L., Jiao, B., Hu, H., Ma, X., Agyei, D., and Shi, A., 2023. Plant Protein-Based Emulsifiers: Mechanisms, Techniques for Emulsification Enhancement and Applications. *Food Hydrocolloids*, 144, 109008.
- Zhao, Y., Hou, Q., Zhuang, X., Wang, Y., Zhou, G., and Zhang, W., 2018. Effect of regenerated cellulose fiber on the physicochemical properties and sensory characteristics of fat-reduced emulsified sausage. *LWT*, 97, 157–163.
- Zhong, L., Guo, X., Xue, H., Qiao, Y., Mao, D., Ye, X., Cui, Z., Li, Z., Hu, G., and Huang, Y., 2023. Quality Characteristics of Reduced-Fat Emulsified Sausages Made with Yeast Mannoprotein Enzymatically Prepared with a β -1,6-glucanase. *Foods*, 12 (13), 1–14.