DAFTAR PUSTAKA

Agustina, S., Purwanto, Y. A., & Budiastra, I. W. (2015). Prediksi Kandungan Kimia Mangga Arumanis selama Penyimpanan dengan Spektroskopi NIR Arumanis Mango Chemical Contents Prediction during Storage using. *Jurnal Keteknikan Pertanian*, *3*(1), 57–63. https://doi.org/https://doi.org/10.19028/jtep.03.1.%25p

Ahmad, R., Ahmad, N., & Shehzad, A. (2019). Solvent and Temperature Effects of Accelerated Solvent Extraction (ASE) with Ultra-high Pressure Liquid Chromatography (UHPLC-PDA) Technique for Determination of Piperine and Its ICP-MS Analysis. *Industrial Crops and Products*, *136*(April), 37–49. https://doi.org/10.1016/j.indcrop.2019.04.016

Ali, A., Devarajan, S., Waly, M. I., Essa, M. M., & Rahman, M. S. (2012). Nutritional and Medicinal Values of Papaya (Carica papaya L.). *Natural Products and Their Active Compounds on Disease Prevention*, *August*, 307–324. https://doi.org/10.20959/wjpps20178-9947

Alves, F. S., Rego, J. de A. R. Do, Costa, M. L. D. S., Costa, R. A. Da, Cruz, J. N., & Brasil, D. D. S. B. (2020). Spectroscopic Methods and in Silico Analyses using Density Functional Theory to Characterize and Identify Piperine Alkaloid Crystals Isolated from Pepper (Piper Nigrum L.). *Journal of Biomolecular Structure and Dynamics*, *38*(9), 2792–2799. https://doi.org/10.1080/07391102.2019.1639547

Anggraini, R., Jayuska, A., & Alimuddin, A. H. (2018). Isolasi dan Karakterisasi Minyak Atsiri Lada Hitam (Piper nigrum L.) Asal Sajingan Kalimantan Barat. *Jurnal Kimia Khatulistiwa*, *7*(4), 124–133. https://jurnal.untan.ac.id/index.php/jkkmipa/article/view/28828

Badaró, A. T., Morimitsu, F. L., Ferreira, A. R., Clerici, M. T. P. S., & Fernandes Barbin, D. (2019). Identification of Fiber Added to Semolina by Near Infrared (NIR) Spectral Techniques. *Food Chemistry*, *289*(March), 195–203. https://doi.org/10.1016/j.foodchem.2019.03.057

Bock, D. P., Daelemans, L., Selis, L., Raes, K., Vermeir, P., Eeckhout, M., & Van Bockstaele, F. (2021). Comparison of the Chemical and Technological Characteristics of Wholemeal Flours Obtained from Amaranth (Amaranthus sp.), Quinoa (Chenopodium quinoa) and Buckwheat (Fagopyrum sp.) Seeds. *Foods*, *10*(3). https://doi.org/10.3390/foods10030651

Botros, L. L., Jablonski, J., Chang, C., Bergana, M. M., Wehling, P., Harnly, J. M., Downey, G., Harrington, P., Potts, A. R., & Moore, J. C. (2013). Exploring Authentic Skim and Nonfat Dry Milk Powder Variance for the Development of Nontargeted Adulterant Detection Methods Using Near-Infrared Spectroscopy and Chemometrics. *Journal of Agricultural and Food Chemistry*, *61*(41), 9810–9818. https://doi.org/10.1021/jf4023433

Codex Alimentarius. (2017). *Standard for Black, White, and Green Peppers*. *CXS 326-20*(FAO/ WHO Food Standards).

Dachriyanus. (2004). *Analisis Struktur Senyawa Organik Secara Spektroskopi*. Lembaga Pengembangan Teknologi Informasi dan Komunikasi (LPTIK) Universitas Andalas. http://carano.pustaka.unand.ac.id/index.php/car/catalog/book/3

De Mey, D. E., De Maere, H., Dewulf, L., Paelinck, H., Sajewicz, M., Fraeye, I., & Kowalska, T. (2014). Application of Accelerated Solvent Extraction (ASE) and Thin Layer Chromatography (TLC) to Determination of Piperine in Commercial Samples of Pepper (Piper nigrum l.). *Journal of Liquid Chromatography and Related Technologies*, *37*(20), 2980–2988. https://doi.org/10.1080/10739149.2014.907014

Dissanayake, D. R. R. P., Herath, H. M. P. D., Dissanayake, M. D. M. I. M., Chamikara, M. D. M., Jayakody, M. M., Amaresekara, S. S. C., Kularathna, K. W. T. R., Karannagoda, N. N. H., Ishan, M., & Sooriyapathirana, S. D. S. S. (2016). The Length Polymorphism of the Locus psbA-trnH is Idyllic to Detect the Adulterations of Black Pepper with Papaya Seeds and Chili. *Journal of Agricultural Sciences*, *11*(2), 74. https://doi.org/10.4038/jas.v11i2.8120

Erasmus, S. W., van Hasselt, L., Ebbinge, L. M., & van Ruth, S. M. (2021). Real or Fake Yellow in the Vibrant Colour Craze: Rapid Detection of Lead Chromate in Turmeric. *Food Control*, *121*(xxxx), 107714. https://doi.org/10.1016/j.foodcont.2020.107714

Esquerre, C. A., Achata, E. M., García-Vaquero, M., Zhang, Z., Tiwari, B. K., & O'Donnell, C. P. (2020). Use of an NIR MEMS Spectrophotometer and Visible/NIR Hyperspectral Imaging Systems to Predict Quality Parameters of Treated Ground Peppercorns. *LWT*, *131*, 109761. https://doi.org/10.1016/j.lwt.2020.109761

Fan, R., Qin, X. W., Hu, R. S., Hu, L. S., Wu, B. D., & Hao, C. Y. (2020). Studies on the Chemical and Flavour Qualities of White Pepper (Piper nigrum L.)

Derived from Grafted and non-Grafted Plants. *European Food Research and Technology*, *246*(12), 2601–2610. https://doi.org/10.1007/s00217-020-03600-1

Ferreira, D. S., Pallone, J. A. L., & Poppi, R. J. (2013). Fourier Transform Near-Infrared Spectroscopy (FT-NIRS) Application to Estimate Brazilian Soybean [Glycine max (L.) Merril] Composition. *Food Research International*, *51*(1), 53–58. https://doi.org/10.1016/j.foodres.2012.09.015

Firmansyah, A., Sundalian, M., Suprijana, O., & Fauziah, R. P. (2018). Studi Spektrum Derivatif Ftir Daging Sapi Dan Daging Babi Setelah Melalui Reaksi Enzimatis. *Indonesian Journal of Pharmaceutical Science and Technology*, *7*(2), 24–33. https://ejournal.stfi.ac.id/index.php/jstfi/article/download/47/38

Food and Agriculture Organization (FAO). (2022). *FAOSTAT*. http://www.fao.org/faostat/en/#data/QCL

Galvin-King, P., Haughey, S. A., & Elliott, C. T. (2021). Garlic Adulteration Detection using NIR and FTIR Spectroscopy and Chemometrics. *Journal of Food Composition and Analysis*, *96*, 103757. https://doi.org/10.1016/j.jfca.2020.103757

Gul, I., Nasrullah, N., Nissar, U., Saifi, M., & Abdin, M. Z. (2018). Development of DNA and GC-MS Fingerprints for Authentication and Quality Control of Piper nigrum L. and Its Adulterant Carica papaya L. *Food Analytical Methods*, *11*(4), 1209–1222. https://doi.org/10.1007/s12161-017-1088-7

Hadiwijaya, Y., Kusumiyati, K., & Munawar, A. A. (2020). Penerapan Teknologi Visible-Near Infrared Spectroscopy untuk Prediksi Cepat dan Simultan Kadar Air Buah Melon (Cucumis melo L.) Golden. *Agroteknika*, *3*(2), 67–74. https://doi.org/10.32530/agroteknika.v3i2.83

Halwan, C. A., & Nisa, F. C. (2015). Pembuatan Mie Kering Gembili dan Bekatul (Kajian Proporsi Terigu: Gembili dan Penambahan Bekatul). *Jurnal Pangan Dan Agroindustri*, *3*(4), 1548–1559. https://jpa.ub.ac.id/index.php/jpa/article/view/279

Hammouti, B., Dahmani, M., Yahyi, A., Ettouhami, A., Messali, M., Asehraou, A., Asehraou, A., Bouyanzer, A., Warad, I., & Touzani, R. (2019). Black Pepper, the "King of Spices": Chemical Composition to Applications. *Arabian Journal of Chemical and Environmental Research*, *06*(1), 12–56. https://www.researchgate.net/publication/343510625

Hansen, P. W., & Holroyd, S. E. (2019). Development and application of Fourier transform infrared spectroscopy for detection of milk adulteration in practice. *International Journal of Dairy Technology*, *72*(3), 321–331. https://doi.org/10.1111/1471-0307.12592

Hardiansyah, A., Backe, D., & Tety, E. (2015). Analisis Keunggulan Komparatif Lada Indonesia di Pasar Internasional. *Journal of Chemical Information and Modeling*, *110*(9), 1689–1699. https://pekbis.ejournal.unri.ac.id/index.php/JPEB/article/view/2892/2831

Haryani, A. T., Andini, S., & Hartini, S. (2015). Kadar Gizi, Pati Resisten, dan Indeks Glikemik Biskuit Gandum Utuh (Triticum aestivum L) Varietas DWR-162. *Jurnal Teknologi Pangan Dan Hasil Pertanian*, *12*(1), 1–12. http://journals.usm.ac.id/index.php/jtphp/article/view/470/279

Haryani, K., Siregar, A., & Larasati, D. L. (2020). Modifikasi Pati Sorgum (Sorgum bicolor L.) dengan Metode Oksidasi Menggunakan Hidrogen Peroksida. *Inovasi Teknik Kimia*, *5*(2), 98–101. https://publikasiilmiah.unwahas.ac.id/index.php/inteka/article/view/3818

He, Y., Bai, X., Xiao, Q., Liu, F., Zhou, L., & Zhang, C. (2021). Detection of Adulteration in Food Based on Nondestructive Analysis Techniques: A Review. *Critical Reviews in Food Science and Nutrition*, *61*(14), 2351–2371. https://doi.org/10.1080/10408398.2020.1777526

Hendrajaya, K., Jamailah, N., & Azminah, A. (2021). Identifikasi Alkohol dalam Hand Sanitizer secara Fourier Transform Infra Red (FTIR) dan Kemometrik. *MPI (Media Pharmaceutica Indonesiana)*, *3*(4), 208–216. https://doi.org/10.24123/mpi.v3i4.4627

Hernani, N., Hidayat, T., & Risfaheri, N. (2021). Evaluasi Mutu Lada Putih Bubuk yang Diperdagangkan di Pasar Tradisional dan Modern di Bogor dan Jakarta. *Jurnal Penelitian Pascapanen Pertanian*, *17*(3), 126. https://doi.org/10.21082/jpasca.v17n3.2020.126-133

Hu, L., Yin, C., Ma, S., & Liu, Z. (2018). Assessing the Authenticity of Black Pepper using Diffuse Reflectance Mid-Infrared Fourier Transform Spectroscopy Coupled with Chemometrics. *Computers and Electronics in Agriculture*, *154*(September), 491–500. https://doi.org/10.1016/j.compag.2018.09.029

Ikhram, M., Zulfahrizal, Z., & Munawar, A. A. (2017). Pengembangan Sensor FT-NIR Melalui Transformasi Wavelet Untuk Evaluasi Kadar Gula Mangga Gadung (Mangifera Indica). *Jurnal Ilmiah Mahasiswa Pertanian*, *2*(3), 276–293. https://doi.org/10.17969/jimfp.v2i3.3721

Imam, R. H., Primaniyarta, M., & Palupi, N. S. (2014). Konsistensi Mutu Pilus Tepung Tapioka: Identifikasi Parameter Utama Penentu Kerenyahan. *Jurnal Mutu Pangan*, *1*(2), 91–99. https://journal.ipb.ac.id/index.php/jmpi/article/view/27862

International Pepper Community (IPC). (2021). *Indonesia*. https://www.ipcnet.org/country/indonesia/

Iryani, A. S. (2013). Pengaruh Jenis Katalis Asam terhadap Studi Kinetika Proses Hidrolisis Pati dalam Ubi Kayu. *ILTEK*, *8*(15), 2–5. https://www.researchgate.net/publication/340735456_PENGARUH_JENIS_KATALIS_ASAM_TERHADAP_STUDI_KINETIKA_PROSES_HIDROLISIS_PATI_DALAM_UBI_KAYU

Jamwal, R., Amit, Kumari, S., Balan, B., Dhaulaniya, A. S., Kelly, S., Cannavan, A., & Singh, D. K. (2020). Attenuated total Reflectance–Fourier Transform Infrared (ATR–FTIR) Spectroscopy Coupled with Chemometrics for Rapid Detection of Argemone Oil Adulteration in Mustard Oil. *LWT*, *120*(August 2019), 108945. https://doi.org/10.1016/j.lwt.2019.108945

Jawaid, S., Talpur, F. N., Sherazi, S. T. H., Nizamani, S. M., & Khaskheli, A. A. (2013). Rapid Detection of Melamine Adulteration in Dairy Milk by SB-ATR–Fourier Transform Infrared Spectroscopy. *Food Chemistry*, *141*(3), 3066–3071. https://doi.org/10.1016/j.foodchem.2013.05.106

Ji, Y., Li, S., & Ho, C.-T. (2019). Chemical Composition, Sensory Properties and Application of Sichuan Pepper (Zanthoxylum genus). *Food Science and Human Wellness*, *8*(2), 115–125. https://doi.org/10.1016/j.fshw.2019.03.008

Kaavya, R., Pandiselvam, R., Mohammed, M., Dakshayani, R., Kothakota, A., Ramesh, S. V., Cozzolino, D., & Ashokkumar, C. (2020). Application of Infrared Spectroscopy Techniques for the Assessment of Quality and Safety in Spices: A Review. *Applied Spectroscopy Reviews*, *55*(7), 593–611. https://doi.org/10.1080/05704928.2020.1713801

Karunathilaka, S. R., Yakes, B. J., He, K., Bruckner, L., & Mossoba, M. M. (2018). First Use of Handheld Raman Spectroscopic Devices and On-Board

Chemometric Analysis for the Detection of Milk Powder Adulteration. *Food Control*, *92*, 137–146.

Khan, S., Xiaobo, Z., Ilyas, M., Rahman, K. U., Khan, R. D., & Ahmad, A. (2021). Fraud Food and Food Spoilage Detection by Non-Destructive Technologies. *Annals of the Romanian Society for Cell Biology*, *25*(7), 1390–1406. https://annalsofrscb.ro/index.php/journal/article/view/10474

Kucharska-Ambrożej, K., & Karpinska, J. (2020). The Application of Spectroscopic Techniques in Combination with Chemometrics for Detection Adulteration of Some Herbs and Spices. *Microchemical Journal*, *153*(August 2019), 104278. https://doi.org/10.1016/j.microc.2019.104278

Kulushtayeva, B., Rebezov, M., Igenbayev, A., Kichko, Y., Burakovskaya, N., Kulakov, V., & Khayrullin, M. (2019). Gluten-Free Diet: Positive and Negative Effect on Human Health. *Indian Journal of Public Health Research & Development*, *10*(7), 889. https://doi.org/10.5958/0976-5506.2019.01690.5

Lafeuille, J. L., Brun, M., Lefèvre, S., Menezes, C., & Candalino, I. F. (2022). A Validated Qualitative Method using Oleuropein as a Robust Biomarker to Confirm Ground Black Pepper (Piper nigrum L.) Adulteration with Olive (Olea europaea L.) by-Products. *NFS Journal*, *27*(March), 21–27. https://doi.org/10.1016/j.nfs.2022.03.002

Lafeuille, J. L., Frégière-Salomon, A., Michelet, A., & Henry, K. L. (2020). A Rapid Non-Targeted Method for Detecting the Adulteration of Black Pepper with a Broad Range of Endogenous and Exogenous Material at Economically Motivating Levels Using Micro-ATR-FT-MIR Imaging. *Journal of Agricultural and Food Chemistry*, *68*(1), 390–401. https://doi.org/10.1021/acs.jafc.9b03865

Lapcharoensuk, R., Chalachai, S., Sinjaru, S., Singsriand, P., Hongwiangjan, J., & Yaemphochai, N. (2019). Quantitative Detection of Pepper Powder Adulterated with Rice Powder using Fourier-Transform Near Infrared Spectroscopy. *IOP Conference Series: Earth and Environmental Science*, *301*(1). https://doi.org/10.1088/1755-1315/301/1/012068

Lee, H. Y., & Ko, M. J. (2021). Thermal Decomposition and Oxidation of β-Caryophyllene in Black Pepper During Subcritical Water Extraction. *Food Science and Biotechnology*, *30*(12), 1527–1533. https://doi.org/10.1007/s10068-021-00983-z

Li, X., Lu, R., Wang, Z., Wang, P., Zhang, L., & Jia, P. (2018). Detection of Corn and Whole Wheat Adulteration in White Pepper Powder by Near Infrared Spectroscopy. *American Journal of Food Science and Technology*, *6*(3), 114–117. https://doi.org/10.12691/ajfst-6-3-5

Liang, J., Sun, J., Chen, P., Frazier, J., Benefield, V., & Zhang, M. (2020). Chemical Analysis and Classification of Black Pepper (Piper nigrum L.) Based on Their Country of Origin using Mass Spectrometric Methods and Chemometrics. *Food Research International*, *140*(November), 109877. https://doi.org/10.1016/j.foodres.2020.109877

Lima, A. B. S. de, Batista, A. S., Jesus, J. C. de, Silva, J. de J., Araújo, A. C. M. de, & Santos, L. S. (2020). Fast Quantitative Detection of Black Pepper and Cumin Adulterations by Near-Infrared Spectroscopy and Multivariate Modeling. *Food Control*, *107*, 1–12. https://doi.org/10.1016/j.foodcont.2019.106802

Lohumi, S., Lee, S., Lee, H., & Cho, B. K. (2015). A Review of Vibrational Spectroscopic Techniques for the Detection of Food Authenticity and Adulteration. *Trends in Food Science and Technology*, *46*(1), 85–98. https://doi.org/10.1016/j.tifs.2015.08.003

Malacrida, C. R., Kimura, M., & Jorge, N. (2011). Characterization of A High Oleic Oil Extracted from Papaya (Carica papaya L.) Seeds. *Ciência e Tecnologia de Alimentos*, *31*(4), 929–934. https://doi.org/10.1590/s0101-20612011000400016

Mamuaja, C. F., & Lamaega, J. C. E. (2015). Pembuatan Beras Analog dari Ubi Kayu, Pisang Goroho dan Sagu. *Jurnal Ilmu Dan Teknologi Pangan*, *3*(2), 8–14. https://media.neliti.com/media/publications/98609-ID-none.pdf

Maruzy, A., Athikah Fatkhul Jannah, D., Pitoyo, A., & Subositi, D. (2020). Studi Perbandingan Karakter Makroskopis Dan Mikroskopis Tiga Jenis Phyllanthus L. *Floribunda*, *6*(4). https://doi.org/10.32556/floribunda.v6i4.2020.312

McGoverin, C. M., September, D. J. F., Geladia, P., & Manley, M. (2012). Near Infrared and Mid-Infrared Spectroscopy for the Quantification of Adulterants in Ground Black Pepper. *Journal of Near Infrared Spectroscopy*, *20*(5), 521–528. https://doi.org/10.1255/jnirs.1008

McGrath, T. F., Haughey, S. A., Patterson, J., Fauhl-Hassek, C., Donarski, J., Alewijn, M., van Ruth, S., & Elliott, C. T. (2018). What are the scientific

challenges in moving from targeted to non-targeted methods for food fraud testing and how can they be addressed? – Spectroscopy case study. *Trends in Food Science and Technology*, *76*(March), 38–55. https://doi.org/10.1016/j.tifs.2018.04.001

Mei, J., Zhao, F., Xu, R., & Huang, Y. (2021). A Review on the Application of Spectroscopy to the Condiments Detection: from Safety to Authenticity. *Critical Reviews in Food Science and Nutrition*, *0*(0), 1–16. https://doi.org/10.1080/10408398.2021.1901257

Mendes, E., & Duarte, N. (2021). Mid-Infrared Spectroscopy as a Valuable Tool to Tackle Food Analysis: A Literature Review on Coffee, Dairies, Honey, Olive Oil and Wine. *Foods*, *10*(2), 1–32. https://doi.org/10.3390/foods10020477

Modupalli, N., Naik, M., Sunil, C. K., & Natarajan, V. (2021). Emerging Non-Destructive Methods for Quality and Safety Monitoring of Spices. *Trends in Food Science and Technology*, *108*(December 2020), 133–147. https://doi.org/10.1016/j.tifs.2020.12.021

Monoarfa, M. I., Hariyanto, Y., & Rasyid, A. (2021). Analisis Penyebab Bottleneck pada Aliran Produksi Briquette Charcoal dengan Menggunakan Diagram Tulang Ikan. *Jambura Industrial Review (JIREV)*, *1*(1), 15–21. https://doi.org/10.37905/jirev.1.1.15-21

Moubarik, A., Mansouri, H. R., Pizzi, A., Charrier, F., Allal, A., & Charrier, B. (2013). Corn Flour-Mimosa Tannin-Based Adhesives without Formaldehyde for Interior Particleboard Production. *Wood Science and Technology*, *47*(4), 675–683. https://doi.org/10.1007/s00226-012-0525-4

Natarajan, S., & Ponnusamy, V. (2020). A Review on Food Toxic Identification Using Various Spectroscopic Techniques. *Journal of Xi'an University of Architecture & Technology*, *XII*(Vii), 377–382. http://xajzkjdx.cn/gallery/40-july2020.pdf

Naumenko, N., Potoroko, I., Kalinina, I., Fatkullin, R., & Ivanisova, E. (2021). The Influence of the Use of Whole Grain Flour from Sprouted Wheat Grain on the Rheological and Microstructural Properties of Dough and Bread. *International Journal of Food Science*, *2021*. https://doi.org/10.1155/2021/7548759

Nurllah, I., & Iswari, J. (2019). Pengaruh Perubahan Harga Lada Putih Terhadap Kesejahteraan Masyarakat Di Kecamatan Jebus Kabupaten Bangka Barat. *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan*

Agribisnis, *5*(2), 224. https://doi.org/10.25157/ma.v5i2.2112

Nyfantoro, F., Salim, T. A., & Mirmani, A. (2020). Perkembangan Pengelolaan Arsip Elektronik Di Indonesia: Tinjauan Pustaka Sistematis. *Diplomatika: Jurnal Kearsipan Terapan*, *3*(1), 1. https://doi.org/10.22146/diplomatika.48495

Olale, K., Walyambillah, W., Mohammed, S. A., Sila, A., & Shepherd, K. (2017). Application of DRIFT-FTIR Spectroscopy for Quantitative Prediction of Simple Sugars in Two Local and Two Floridian Mango (Mangifera indica L.) Cultivars in Kenya. *Journal of Analytical Science and Technology*, *8*(1). https://doi.org/10.1186/s40543-017-0130-0

Oliveira, M. M., Cruz-Tirado, J. P., Roque, J. V., Teófilo, R. F., & Barbin, D. F. (2020). Portable Near-Infrared Spectroscopy for Rapid Authentication of Adulterated Paprika Powder. *Journal of Food Composition and Analysis*, *87*(December 2019). https://doi.org/10.1016/j.jfca.2019.103403

Orrillo, I., Cruz-Tirado, J. P., Cardenas, A., Oruna, M., Carnero, A., Barbin, D. F., & Siche, R. (2019). Hyperspectral Imaging as a Powerful Tool for Identification of Papaya Seeds in Black Pepper. *Food Control*, *101*(December 2018), 45–52. https://doi.org/10.1016/j.foodcont.2019.02.036

Parvathy, V. A., Swetha, V. P., Sheeja, T. E., Leela, N. K., Chempakam, B., & Sasikumar, B. (2014). DNA Barcoding to Detect Chilli Adulteration in Traded Black Pepper Powder. *Food Biotechnology*, *28*(1), 25–40. https://doi.org/10.1080/08905436.2013.870078

Petrakis, E. A., & Polissiou, M. G. (2017). Assessing Saffron (Crocus sativus L.) Adulteration with Plant-Derived Adulterants by Diffuse Reflectance Infrared Fourier Transform Spectroscopy Coupled with Chemometrics. *Talanta*, *162*, 558–566. https://doi.org/10.1016/j.talanta.2016.10.072

Pimentel, L. G., Barreto, M. S. C., da Silva Oliveira, D. M., Cherubin, M. R., Demattê, J. A. M., Cerri, C. E. P., & Cerri, C. C. (2019). Diffuse Reflectance Infrared Fourier Transform (DRIFT) Spectroscopy to Assess Decomposition Dynamics of Sugarcane Straw. *Bioenergy Research*, *12*(4), 909–919. https://doi.org/10.1007/s12155-019-10024-7

Rafi, M., Anggundari, W. C., & Irawadi, T. T. (2016). Potensi Spektroskopi Ftir-Atr Dan Kemometrik Untuk Membedakan Rambut Babi, Kambing, Dan Sapi. *Indonesian Journal of Chemical Science*, *5*(3), 229–234.

https://journal.unnes.ac.id/sju/index.php/ijcs/article/view/10654/7612

Rahmawati, A., Kuswandi, B., & Retnaningtyas, Y. (2015). Deteksi Gelatin Babi pada Sampel Permen Lunak Jelly Menggunakan Metode Fourier Transform Infra Red (FTIR) dan Kemometrik. *Jurnal Pustaka Kesehatan*, *3*(2), 278–283. https://jurnal.unej.ac.id/index.php/JPK/article/view/2586

Rampengan, A. M. (2017). Analisis Gugus Fungsi pada Polimer Polyethylene Glycol (PEG) Coated-Nanopartikel Oksida Besi Hitam (Fe3O4) dan Biomolekul. *Fullerene Journal of Chemistry*, *2*(2), 96. https://doi.org/10.37033/fjc.v2i2.18

Rasyida, K., Bambang, K., & Nia, K. (2014). Deteksi Kemurnian Air Zamzam Menggunakan Metode Spektrofotometri Near Infra Red (NIR) dan Kemometrik. *Pustaka Kesehatan*, *2*(3), 439–444. https://jurnal.unej.ac.id/index.php/JPK/article/view/2051

Ratnasari, F. A., Wulandari, L., & Kristiningrum, N. (2016). Penentuan Kadar Fenol Total pada Ekstrak Daun Tanaman Menggunakan Metode Spektroskopi NIR dan Kemometrik (Determination of Total Phenolic in Leave Extracts Using Spectroscopy NIR and Chemometric). *E-Jurnal Pustaka Kesehatan*, *4*(2), 235–240. https://jurnal.unej.ac.id/index.php/JPK/article/view/3034/2440

Rekha, K., Singh, R. S., Shekhawat, K., Kishore, C., Singh, K. S., & Kushwaha, R. K. (2020). SCAR Marker: A Potential Tool to Combat Food Adulteration. *International Journal of Chemical Studies*, *8*(1), 801–805. https://doi.org/10.22271/chemi.2020.v8.i1l.8363

Rifna, E. J., Pandiselvam, R., Kothakota, A., Subba Rao, K. V., Dwivedi, M., Kumar, M., Thirumdas, R., & Ramesh, S. V. (2022). Advanced Process Analytical Tools for Identification of Adulterants in Edible Oils – A Review. *Food Chemistry*, *369*(August), 130898. https://doi.org/10.1016/j.foodchem.2021.130898

Risal, Y., & Rifai, Y. (2020). Analisis Kemometrik Senyawa Inhibitor Tirosinase Menggunakan Spektrofotometer IR (FTIR). *Majalah Farmasi Dan Farmakologi*, *24*(2), 59–62. https://doi.org/10.20956/mff.v24i2.10610

Rivera-Pérez, A., Romero-González, R., & Garrido Frenich, A. (2021). Feasibility of Applying Untargeted Metabolomics with GC-Orbitrap-HRMS and Chemometrics for Authentication of Black Pepper (Piper nigrum L.) and Identification of Geographical and Processing Markers. *Journal of*

Agricultural and Food Chemistry, *69*(19), 5547–5558. https://doi.org/10.1021/acs.jafc.1c01515

Ruth, S. M. van, Silvis, I. C. J., Ramos, M. E., Luning, P. A., Jansen, M., Elliott, C. T., & Alewijn, M. (2019). A Cool Comparison of Black and White Pepper Grades. *Lwt*, *106*(November 2018), 122–127. https://doi.org/10.1016/j.lwt.2019.02.054

Sabilla, N. F., & Murtini, E. S. (2020). Pemanfaatan Tepung Ampas Kelapa Dalam Pembuatan Flakes Cereal (Kajian Proporsi Tepung Ampas Kelapa: Tepung Beras). *Jurnal Teknologi Pertanian*, *21*(3), 155–164. https://doi.org/10.21776/ub.jtp.2020.021.03.2

Sahuleka, C. E., Muninggar, J., & Rondonuwu, F. S. (2019). Pencitraan Inframerah Dekat dari Lemak Sapi pada Model Lemak Tissue. *Jurnal Fisika Dan Aplikasinya*, *15*(3), 86. https://doi.org/10.12962/j24604682.v15i3.4584

Sanjiwani, N. M. S., Paramitha, D. A. I., Chandra, A. A., Ariawan, I. M. D., Megawati, F., Dewi, T. W. N., Miarati, P. A. M., & Sudiarsa, I. W. (2020). Pembuatan Hair Tonic Berbahan Dasar Lidah Buaya dan Analisis dengan Fourier Transform Infrared. *Jurnal Widyadari*, *21*(1), 249–262. https://doi.org/10.5281/zenodo.3756902

Sari, N. W., Fajri, M. Y., & W, A. (2018). Analisis Fitokimia Dan Gugus Fungsi Dari Ekstrak Etanol Pisang Goroho Merah (Musa Acuminate (L). *Ijobb*, *2*(1), 30. https://ijobb.esaunggul.ac.id/index.php/IJOBB/article/view/26

Sarifudin, A., Setiaboma, W., Ekafitri, R., Afifah, N., Ratnawati, L., Ari Pudiyanto, E., & Sutisna Achyadi, N. (2021). Adulterated Powdered White Pepper Products by Tapioca Flour Sold in Indonesian's Online Market Investigated by Simple FTIR Analytical Method. *Journal of Food and Nutrition Research*, *9*(6), 297–303. https://doi.org/10.12691/jfnr-9-6-5

Schnabel, A., Cotinguiba, F., Athmer, B., Yang, C., Westermann, B., Schaks, A., Porzel, A., Brandt, W., Schumacher, F., & Vogt, T. (2020). A Piperic Acid CoA Ligase Produces a Putative Precursor of Piperine, the Pungent Principle from Black Pepper Fruits. *Plant Journal*, *102*(3), 569–581. https://doi.org/10.1111/tpj.14652

Septiani, T., & Roswien, A. P. (2018). Analisis Kualitatif Kandungan Boraks Pada Bahan Pangan Daging Olahan dan Identifikasi Sumber Boron dengan FTIR – ATR. *Indonesia Journal of Halal*, *1*(1), 48.

https://doi.org/10.14710/halal.v1i1.3403

Siregar, Y. D. I., Heryanto, R., Lela, N., & Lestari, T. H. (2015). Karakterisasi Karbon Aktif Asal Tumbuhan dan Tulang Hewan Menggunakan FTIR dan Analisis Kemometrika. *Jurnal Kimia VALENSI*, *1*(2), 103–116. https://doi.org/10.15408/jkv.v0i0.3146

Song, X., She, S., Xin, M., Chen, L., Li, Y., Heyden, Y. Vander, Rogers, K. M., & Chen, L. (2020). Detection of Adulteration in Chinese Monofloral Honey using 1H Nuclear Magnetic Resonance and Chemometrics. *Journal of Food Composition and Analysis*, *86*, 103390. https://doi.org/10.1016/j.jfca.2019.103390

Standar Nasional Indonesia (SNI). (2013a). *Lada Hitam* (Patent No. SNI 0005:2013).

Standar Nasional Indonesia (SNI). (2013b). *Lada Putih* (Patent No. SNI 0004:2013).

Stuart, B. H. (2004). *Infrared Spectroscopy: Fundamentals and Applications*. John Wiley & Sons, Ltd. https://doi.org/10.1002/0470011149

Suhandy, D., & Yulia, M. (2021). Uji Keaslian Kopi Bubuk Spesialti Arabika Gayo Aceh Menggunakan Spektroskopi UV dan Kemometrika. *AgriTECH*, *41*(1), 58. https://doi.org/10.22146/agritech.56451

Suhandy, D., Yulia, M., & Kusumiyati, K. (2020). Klasifikasi Madu Berdasarkan Jenis Lebah (Apis dorsata versus Apis mellifera) Menggunakan Spektroskopi Ultraviolet dan Kemometrika. *Jurnal Ilmu Pertanian Indonesia*, *25*(4), 564–573. https://doi.org/10.18343/jipi.25.4.564

Sulistyani, M., & Huda, N. (2017). Optimasi Pengukuran Spektrum Vibrasi Sampel Protein Menggunakan Spektrofotometer Fourier Transform Infra Red (FT-IR). *Indonesian Journal of Chemical Science*, *6*(2), 173–180. https://journal.unnes.ac.id/sju/index.php/ijcs/article/view/16144/8641

Sutamihardja, R., Yuliani, N., & Rosani, O. (2018). Optimasi Suhu Pengeringan dengan Menggunakan Oven terhadap Mutu Lada Hitam dan Lada Putih Bubuk. *Jurnal Sains Natural*, *8*(2), 80. https://doi.org/10.31938/jsn.v8i2.158

Umar, A. H., Syahruni, R., Burhan, A., Maryam, F., Amin, A., Marwati, & Masero,

L. R. (2016). Determinasi dan Analisis Finger Print Tanaman Murbei (Morus alba Lour) Sebagai Bahan Baku Obat Tradisional dengan Metode Spektroskopi FT-IR dan Kemometrik. *Pharmacon*, *5*(1), 78–90. https://doi.org/10.35799/pha.5.2016.11227

Uncu, O., Ozen, B., & Tokatli, F. (2019). Mid-Infrared Spectroscopic Detection of Sunflower Oil Adulteration with Safflower Oil. *Grasas y Aceites*, *70*(1), 1–10. https://doi.org/10.3989/gya.0579181

Vadivel, V., Ravichandran, N., Rajalakshmi, P., Brindha, P., Gopal, A., & Kumaravelu, C. (2018). Microscopic, Phytochemical, HPTLC, GC–MS and NIRS Methods to Differentiate Herbal Adulterants: Pepper and Papaya Seeds. *Journal of Herbal Medicine*, *11*, 36–45. https://doi.org/10.1016/j.hermed.2018.01.004

Wang, M., Chittiboyina, A. G., Parcher, J. F., Ali, Z., Ford, P., Zhao, J., Avula, B., Wang, Y. H., & Khan, I. A. (2019). Piper nigrum Oil - Determination of Selected Terpenes for Quality Evaluation. *Planta Medica*, *85*(3), 185–194. https://doi.org/10.1055/a-0782-0548

Wasnik, P. G., Menon, R. R., Sivaram, M., Nath, B. S., Balasubramanyam, B. V., & Manjunatha, M. (2019). Development of Mathematical Model for Prediction of Adulteration Levels of Cow Ghee with Vegetable Fat using Image Analysis. *Journal of Food Science and Technology*, *56*(4), 2320–2325. https://doi.org/10.1007/s13197-019-03677-x

Waspiah, Rodiyah, Latifiani, D., & Arifin, R. (2020). Kopi , Kamu , Dan Kita : Pemahaman Konsep Legal Protection Bagi Petani Kopi Terdaftar Indikasi Geografis Berbasis Multi - Sektoral. *Jurnal Pengabdian Hukum Indonesia*, 40–55.

Wilde, A. S., Haughey, S. A., Galvin-King, P., & Elliott, C. T. (2019). The Feasibility of Applying NIR and FT-IR Fingerprinting to Detect Adulteration in Black Pepper. *Food Control*, *100*(January), 1–7. https://doi.org/10.1016/j.foodcont.2018.12.039

Wiradinata, R., Budiastra, I. W., & Widodo, S. (2019). Modifikasi Instrumen NIR untuk Penentuan Kandungan Kimia Bahan Organik secara Cepat dan Non Destruktif. *Jurnal Keteknikan Pertanian*, *7*(1), 49–56.

Xu, L., Cai, C.-B., & Deng, D.-H. (2011). Multivariate Quality Control Solved by One-Class Partial Least Squares Regression: Identification of Adulterated Peanut Oils by Mid-Infrared Spectroscopy. *Journal of Chemometrics*, *25*(10), 568–574. https://doi.org/10.1002/cem.1402

Zaukuu, J. L. Z., Bodor, Z., Vitalis, F., Zsom-Muha, V., & Kovacs, Z. (2019). Near Infrared Spectroscopy as a Rapid Method for Detecting Paprika Powder Adulteration with Corn Flour. *Acta Periodica Technologica*, *50*(January), 346–352. https://doi.org/10.2298/APT1950346Z

Zhang, D., Sun, X., Battino, M., Wei, X., Shi, J., Zhao, L., Liu, S., Xiao, J., Shi, B., & Zou, X. (2021). A Comparative Overview on Chili Pepper (Capsicum genus) and Sichuan Pepper (Zanthoxylum genus): From Pungent Spices to Pharma-Foods. *Trends in Food Science and Technology*, *117*(March), 148–162. https://doi.org/10.1016/j.tifs.2021.03.004

Zhang, W., Pan, Y. G., Huang, W., Chen, H., & Yang, H. (2019). Optimized Ultrasonic-Assisted Extraction of Papaya Seed Oil from Hainan/Eksotika Variety. *Food Science and Nutrition*, *7*(8), 2692–2701. https://doi.org/10.1002/fsn3.1125

Zhao, X., Li, C., Zhao, Z., Wu, G., Xia, L., Jiang, H., Wang, T., Chu, X., & Liu, J. (2021). Generic Models for Rapid Detection of Vanillin and Melamine Adulterated in Infant Formulas from Diverse Brands Based on Near-Infrared Hyperspectral Imaging,. *Infrared Physics and Technology*, *116*(November 2020), 103745. https://doi.org/10.1016/j.infrared.2021.103745

Zhu, F., Mojel, R., & Li, G. (2017). Structure of Black Pepper (Piper nigrum) Starch. *Food Hydrocolloids*, *71*, 102–107. https://doi.org/10.1016/j.foodhyd.2017.05.009