

DAFTAR PUSTAKA

- Abbas, O., Zadravec, M., Baeten, V., Mikus, T., Lesic, T., Vulic, A., Prpic, J., Jemersic, L., Pleadin, J. 2018. Analytical Methods Used for The Authentication of Food of Animal Origin. *Food Chemistry* 246: 6-17.
- Adrianto, H. 2018. Biologi Sel dan Molekuler. Halaman: 127-132. Deepublish, Yogyakarta.
- Ahari, H., Razavilar, V., Motalebi, A. A., Akbariadergani, B., Kakoolaki, S., Shahbazadeh, D., Anvar, A. A., Mooraki, N. 2012. DNA Extraction Using Liquid Nitrogen in Staphylococcus aureus. *Iranian Journal Fisheries Science*. 11(4): 926-929.
- Amertaningtyas, D. 2012. Pengolahan Kerupuk 'Rambak' Kulit di Indonesia. *Jurnal Ilmu-Ilmu Peternakan* 21(3):18-29.
- AOAC. 2005. Official Method of Analysis of The Association of Official Analytical Chemist. 18th Edision. Washington DC.
- Aprilia, P., Ummami, R., Airin, C.M., Aziz, F., & Astuti, P. 2022. Comparison of ELISA and PCR Assays for Detection of Pork Adulteration in Halal-Labelled Beef Products. *Journal of Food Quality and Hazards Control*, 9, 112-117.
- Aripin. 2019. Identifikasi Keragaman Genetik D-Loop DNA Mitokondria pada Itik Sawang. Skripsi. Program Studi Peternakan Fakultas Pertanian dan Peternakan Universitas Islam Negeri Sultan Syarif Kasim Riau.
- Auha, N. A., dan Alauhdin, M. 2021. Development and Validation of Infrared Spectroscopy Methods for Rutin Compound Analysis. *Indonesian Journal of Chemical Science*, Vol 10 (2).
- Badan Standardisasi Nasional. 1996. SNI 01-4308-1996: Kerupuk Kulit. Jakarta: Badan Standardisasi Nasional.
- Bochkovskiy, A., Wang, C.-Y., & Liao, H.-Y. M. 2020. YOLOv4: Optimal speed and accuracy of object detection. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* (pp. 10936-10944).
- Cahyaningsari, D., Latif, H., dan Sudarnika, E. 2019. Identifikasi penambahan daging babi pada pangan berbahan dasar daging sapi menggunakan ELISA dan qPCR. *Acta VETERINARIA Indonesiana*. 7(2): 17-25.
- Dewanata, P. A dan M. Mushlih. 2021. Differences in DNA Purity Test Using UV-Vis Spectrophotometer and Nanodrop Spectrophotometer in Type 2 Diabetes Mellitus Patients. *Indonesian Journal of Innovation Studies*. 15: 1-10.
- Drantantiyas, N. D. G., Yulita, W., Ridwan, N. T., Ramadhani, U. A., Kesuma, R. I., Rakhman, A. Z., Bagaskara, R., Miranto, A., & Mufidah, Z. 2023. Performasi Deteksi Jumlah Manusia Menggunakan YOLOv8. *JASIEK (Jurnal Aplikasi Sains, Informasi, Elektronika dan Komputer)*, 5(2), 63-68.
- Dzikrina, H., D. P. Sari., N. Faridah., S. S. Saidah., S. A. N. Alifah., dan D. Kusumawaty. 2022. Penanda DNA: Uji Halal pada Makanan Olahan Daging Menggunakan Primer Multiplex PCR (Polymerase Chain Reaction). *Jurnal Bios Logos*. 12(1):1-8.

- Ekici, K. 2008. The Species Identification of Raw Meat with SDS-PAGE Technique. *Indian Vet. J.* 85, 1193–1195.
- Erwanto, Y., Abidin, M. Z., Sugiyono, E. Y. P. M., dan Rohman, A. 2014. Identification of pork contaminant in meatballs of Indonesia local market using Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP). *AsianAustralas J Anim Sci.* 27:1487-1492,
- Erwanto, Y., Abidin, M.Z., Sismindari, & Rohman, A. 2012. Pig species identification in meatballs using polymerase chain reaction- restriction fragment length polymorphism for Halal authentication. *International Food Research Journal*, 19(3), 901-906.
- Erwanto, Y., Sugiyono, Rohman, A., Abidin, M. Z., & Ariyani, D. 2012. Identifikasi Daging Babi Menggunakan Metode PCR-RFLP Gen Cytochrome b dan PCR Primer Spesifik Gen Amelogenin. *AGRITECH*, 32(4), 370-377.
- Erwanto, Y., Yuliatmo, R., Fitriyanto, N. A., Abidin, M. Z., Sugiyono, & Rohman, A. 2017. DNA Isolation and Pig Species Detection on Sausage with Various Cooking Temperature and Time. *The 2nd International Conference on Tropical Agriculture*.
- Farag, M. R., Alagawany, El-Hack, M. E. A., Tiwari, R., Dhama, K. 2015. Identification of Animal Species in Meat and Meat Product: Trends and Advance. *Adv Anim Vet.* 3(6):334–346.
- Fitriani, and Iskandar (2015) 'Added Value Analysis of Skin Crackers at Home Industry in Batusangkar City', *International Journal on Advanced Science, Engineering and Information Technology*, 5(3), pp. 252-254.
- Galety, M. G., Al Mukthar, F. H., Maarooof, R. J., & Rofoo, F. 2021. Deep Neural Network Concepts for Classification using Convolutional Neural Network: A Systematic Review and Evaluation. *Technium*, 3(8), 58-70.
- Ghodhbani, R., Saidani, T., Kachoukh, A., Elsayed, M.S., Said, Y. and Ahmed, R. 2025. Hardware-Accelerated Detection of Unauthorized Mining Activities Using YOLOv11 and FPGA, *(IJACSA) International Journal of Advanced Computer Science and Applications*, 16(4).
- Gonzalez, R.C. dan Woods, R.E. 2018. *Digital Image Processing*. 4th ed. Pearson.
- Hadi, Z., Sulaiman, N., Halin, I.A., Yunus, N.A.M. and Mohammed, H.K. 2016. 'Image Processing Techniques to Cope Color Vision Deficiency in Detecting Pork Adulteration in Meatballs Visually', *Research Journal of Applied Sciences, Engineering and Technology*, 13(5), pp. 365–374.
- Hapsari, H. N. 2022. *Penerapan Image Processing dalam Sorting Ukuran Telur*. Makalah IF4073 Interpretasi dan Pengolahan Citra, Institut Teknologi Bandung.
- Hariyadi, S., Nurulita, E., Rais, M. A. 2018. Perbandingan Metode Lisis Jaringan Hewan dalam Proses Isolasi DNA Genom pada Organ Liver Tikus Putih (*Rattus norvegicus*). Dalam: *Prosiding Biology Education Conference*. Fakultas Keguruan dan Ilmu Pendidikan Universitas Jember. 15 (1): 689-691.

- He, L., Zhou, Y., Liu, L., Cao, W., & Ma, J. 2025. Research on object detection and recognition in remote sensing images based on YOLOv11. *Scientific Reports*, 15(1), 14032.
- He, Y., Huang, H. dan Li, D. 2023. Beef Marbling Classification Based on Improved YOLOv5', *Foods*, 12(7), p. 1493. doi: 10.3390/foods12071493.
- Hesananda, R., Simatupang, D. N., dan Wiliani, N. 2022. Cloth Bag Object Detection Using the Yolo Algorithm (You Only See Once) V5. *Journal of Computing and Information System*. Vol.18 No. 2.
- Hidayat, A. S., dan Siradj, M. 2015. Argumentasi Hukum Jaminan Produk Halal. *Jurnal Bimas Islam* Vol. 8 No. 1.
- Hutami, R., Bisyri, H., Sukarno, Nuraini, H., dan Ranasasmita, R. 2018. Ekstraksi DNA dari Daging Sefar untuk Analisis dengan Metode Loop-Mediated Isothermal Amplification (LAMP). *Jurnal Agroindustri Halal* ISSN 2442-3548 Vol.4 No. 2.
- Indriati, M., & Yuniarsih, E. 2019. Multiplex PCR Method of Detecting Pork to Guarantee Halal Status in Meat Processed Products. *Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan*, 7(3), 96-101.
- Jauhani, M. A. 2020. Metode Alternatif Identifikasi Foreksik: Estimasi Umur Melalui Metilasi DNA pada Bercak Darah. Surabaya: Scopindo Media Pustaka.
- Jiang, L., & Zhang, Z. 2021. Research on Image Classification Algorithm Based on Pytorch. *Journal of Physics: Conference Series*, 2010, 012009.
- Jiang, P., Ergu, D., Liu, F., Cai, Y. and Ma, B. 2022. A Review of Yolo Algorithm Developments', *Procedia Computer Science*, 199, pp. 1066–1073.
- Jubayer, F., Soeb, J. A., Mojumder, A. N., Paul, M. K., Barua, P., Kayshar, S., Akter, S. S., Rahman, M., Islam. A. 2021. Detection of Mold on the Food Surface Using YOLOv5. *Current Research in Food Science* 4, (pp: 724-726).
- Kamaliah. 2017. Perbandingan Metode Ekstraksi DNA Phenol-Chloroform dan Kit Extraction pada Sapi Aceh dan Sapi Madura. *Jurnal Biotik* vol. 5 No. 1, 60-65.
- Khan, R., & Hussain, M. 2024. YOLOv11: An overview of the key architectural enhancements. [Preprint]. arXiv. <http://arxiv.org/abs/2410.17725>
- Khikmawati, I., Volkandari, S. H., Adburrahman, Z. H., Pramono, A., dan Cahyadi, M. 2016. Sensitivitas Multiplex-Polymerase Chain Reaction Gen 12S rRNA dalam Mendeteksi Pemalsuan Daging Sapi dengan Daging Babi, Anjing dan Tikus. *Jurnal Veteriner* Vol. 22 No. 4.
- Kulkarni, A. D. 2018. Computer vision and image processing (2nd ed.). Technical Publications.
- Li, Q., Chen, K., Wang, Q., Wang, F., & Deng, W. 2025. Enhanced YOLOv11n: A Method for Potato Peel Damage Detection. *Food Science & Nutrition*, 13, e70576.
- Liao, D., Shen, Y., Du, Y., & Ou, J. 2025. SMV-YOLOv11n: An Advanced High-Precision Algorithm for Underwater Object Detection. *IEEE Access*. (DOI: 10.1109/ACCESS.2025.3584313)

- Lilir, F. B., Palar, C. K. M., dan Lontaan, N. N. 2021. Pengaruh Lama Pengeringan terhadap Proses Pengolahan Kerupuk Kulit Sapi. *Zootec Vol. 41, No. 1: 214-222*.
- Lu, S., Wang, B., Wang, H., Chen, L., Linjian, M., dan Zhang, X. 2019. A Real-Time Object Detection Algorithm for Video. *Computers dan Electrical Engineering*, 77: 398–408.
- Morris, T. *n.d. Image Processing with MATLAB*. Supporting Material for COMP27112.
- Murtiyaningsih, H. 2017. Isolasi DNA genom dan identifikasi kekerabatan genetic nanas menggunakan RAPD (Random Amplified Polimorphic DNA). *Jurnal Agritop*. 15(1): 83-93.
- Muttaqien, A. T. 2013. Analisis Lemak dari Berbagai Kulit dengan Metode Spektroskopi Inframerah sebagai Dasar Identifikasi Bahan Kerupuk Rambak. Tesis. Fakultas Peternakan. Universitas Gadjah Mada.
- Muttaqien, A. T. 2013. Analisis Lemak dari Berbagai Kulit dengan Metode Spektroskopi Inframerah sebagai Dasar Identifikasi Bahan Kerupuk Rambak. Tesis. Fakultas Peternakan. Universitas Gadjah Mada.
- Mvidute, I. dan Melnikas, A. 2022. Real-Time Detection and Classification of Chicken Carcass Bruises Using YOLOv4', *Sensors*, 22(19), p. 7476. doi: 10.3390/s22197476.
- Nowakowski, A. B., Wobig, W. J., dan Petering, D. H. 2014. Native SDS-PAGE: High Resolution Electrophoretic Separation of Proteins with Retention of Native Properties Including Bound Metal Ions. *Metallomic* 6(5): 1068-1078.
- Nugroho, K., Terryana, R. T., & Lestari, P. 2017. Metode Ekstraksi DNA Cabai (*Capsicum annuum* L.) Menggunakan Buffer CTAB (Cethyl Trimethyl Ammonium Bromide) Modifikasi Tanpa Nitrogen Cair. *Scripta Biologica*, 4(2), 91-94.
- Park, C. B., dan Larsson, N. G. 2011. Mitochondrial DNA mutations in disease and aging. *J. Cell Biol.*, 193(5), 809–818.
- Paul, S. 2019. Application of Biomedical Engineering in Neuroscience. Page: 442 in Springer, Singapore.
- Pebrianto, E., Novia, D., dan Vebriyanti, E. 2024. Physicochemical and sensory properties of cow skin crackers from dry salt-preserved skin utilizing sodium meta-bisulfite (SMB). *IOP Conference Series: Earth and Environmental Science*, 1341, 012043.
- Peraturan Kepala Badan POM Nomor 21 tahun 2016 tentang Kategori Pangan.
- Peraturan Pemerintah Republik Indonesia Nomor 39 Tahun 2021 tentang Penyelenggaraan Bidang Jaminan Produk Halal.
- Peraturan Pemerintah Republik Indonesia Nomor 69 Tahun 1999 tentang Label Dan Iklan Pangan Pasal 1 Ayat 5.
- Peraturan Pemerintah Republik Indonesia Nomor 86 Tahun 2019 Tentang Keamanan Pangan.
- Poole, C. F. 2020. Solid-Phase Extraction. Page: 3. In Elsevier.

- Powers, D. M. W. 2020. Evaluation: From Precision, Recall and F-Measure to ROC, Informedness, Markedness & Correlation. *Journal of Machine Learning Technologies*, 2(1), 37-63. DOI: 10.48550/arXiv.2010.16061.
- Priyastomo, D. A., Hilmia, N., Pramudyaswari, E. F., & Islami, R. Z. 2023. Analisis Konsentrasi serta Kemurnian DNA Hasil Ekstraksi Rumput Raja (*Pennisetum purpureoides*) dan Rumput Gajah (*Pennisetum purpureum*) Menggunakan Metode CTAB dan DNAzol. *Pastura*, 12(2), 89-92.
- Putri, A. R. 2016. Pengolahan Citra dengan Menggunakan Web Cam pada Kendaraan Bergerak di Jalan Raya. *Jurnal Ilmiah Pendidikan Informatika*, Vol.1 No. 1, pp: 1-6.
- Quach, L.-D., Quoc, K.N., Quynh, A.N. and Ngoc, H.T. 2023. Evaluating the Effectiveness of YOLO Models in Different Sized Object Detection and Feature-Based Classification of Small Objects', *Journal of Advances in Information Technology*, 14(5), pp. 907–917.
- Rachmawati, R., Susilowati, P. E., Raharjo, S. 2013. Analisis Gen Merkuri Reduktase (merA) pada Isolat Bakteri dari Tambang Emas Kabupaten Bombana Sulawesi Tenggara. *J. Prog. Kim. Si.* 3 (2), 108-123.
- Rahayuningsih, S. and Wibowo, S. 2014. Cowskin cutter bagi kelompok ukm pembuat kerupuk rambak. *ABDIMAS*, 18(2), pp. 125-131.
- Rajesh, B., Neelima, C. R., Lakshmi, V. R., Vani, M. S., & Neeraja, N. V. 2018. Basic Image processing techniques through R-Language. *International Journal of Scientific Development and Research (IJS DR)*, 3(11), 46-53.
- Ray, A., & Kolekar, M. H. 2022. Image Segmentation and Classification Using Deep Learning. In D. Ghai, S. L. Tripathi, S. Saxena, M. Chanda, & M. Alazab (Eds.), *Machine Learning Algorithms for Signal and Image Processing* (pp. 1-18). John Wiley & Sons, Inc.
- Redmon, J., dan Farhadi, A. 2018. YOLOv3: An incremental improvement. [Preprint]. arXiv. <http://arxiv.org/abs/1804.02767>
- Redmon, J., Divvala, S., Girshick, R., & Farhadi, A. 2016. You Only Look Once: Unified, Real-Time Object Detection. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* (pp. 779-788).
- Ren, S., He, K., Girshick, R., dan Sun, J. 2015. Faster R-CNN: Towards real-time object detection with region proposal networks. In *Advances in neural information processing systems* (pp. 91-99).
- Ridho, M. F., Panca, F., Yandi, W., & Rachmani, A. A. 2024. Drowsiness Detection in the Advanced Driver-Assistance System using YOLO V5 Detection Model. *Electron: Jurnal Ilmiah Teknik Elektro*, 5(1), 130–137.
- Ritonga, A. S., & Muhandhis, I. 2024. Analisis Performa Metode YOLO dan Viola-Jones pada Aplikasi Deteksi Kantuk. *Syntax: Journal of Software Engineering, Computer Science and Information Technology*, 5(2), 444-451.
- Rosiani, N., Basito, B., Widowati, E. 2015. Kajian Karakteristik Sensoris Fisik dan Kimia Kerupuk Fortifikasi Daging Lidah Buaya (*Aloe vera*) dengan Metode Pemanggangan Menggunakan *Microwave*. *Jurnal Teknologi Hasil Pertanian*, Vol.8 No.2.

- Sani, R. R., Pratiwi, Y. A., Winarno, S., Udayanti, E. D., & Zami, F. A. 2022. Analisis Perbandingan Algoritma Naive Bayes Classifier dan Support Vector Machine untuk Klasifikasi Hoax pada Berita Online Indonesia. *Jurnal Masyarakat Informatika*, 13(2), 85–98.
- Santosa, B., dan Putri, G. S. A. 2022. Perbandingan sensitivitas dan spesifisitas rapid test anti-hbs dan elisa. *Bali Medika Jurnal*. 9(3): 309-316.
- Saputra, F., Indra, A. I. N., Djuminar, A., Merdekawati, F., & Nurhayati, B. 2024. Konsentrasi dan kemurnian ekstraksi DNA metode sonikasi dan spin column pada sampel dahak penderita tuberkulosis. *Current Biomedicine*, 2(2), 84-92.
- Saubari, N. 2019. Deteksi Citra Wajah dengan Metode Haar Feature Selection. *Jurnal Teknologi Informasi Universitas Lambung Mangkurat (JTIULM)*, 4(1), 7–12.
- Schober, J., Li, R., Norman, S. 2015. *Forensic Biology*. USA: Taylor and Francis.
- Setia, Y. K., Puspawati, N., dan Rukmana, R. 2020. Deteksi Escherichia coli dengan Metode Polimerase Chain Reaction (PCR). Setia Budi Conference on Innovation in Health, Accounting, and Management Sciences.
- Sucipto, S., Zahrok, I.A. and Hendrawan, Y. 2018. Identifikasi Jenis Rambak Olahan Berbasis Analisis Citra dan Jaringan Saraf Tiruan', *JEPIN (Jurnal Edukasi dan Penelitian Informatika)*, 4(2), pp. 90–99.
- Susilowati, T. 2019. Deteksi Kontaminan DNA Babi pada Sampel Penggilingan Daging di Pasar Surya Kota Surabaya Menggunakan Real-Time Polymerase Chain Reaction. Thesis. Program Studi Biologi Fakultas Sains dan Teknologi UIN Sunan Ampel Surabaya.
- Tawakal, I. 2018. Analisis Pembedaan Jenis Krecek Rambak Menggunakan Metode Analisis Citra dan Jaringan Saraf Tiruan. Skripsi. Fakultas Teknologi Pertanian. Universitas Brawijaya.
- Triasih, D., Erwanto, Y., dan Fitrianto, N. A. 2020. Identification of Goat Skin and Pig Skin as the Raw Material of Rambak Using PCR-RFLP Method. *Jurnal Sain Peternakan Indonesia* Vol.15, No. 4.
- Triatmojo, S. 2012. Teknologi Pengolahan Kulit Sapi. Citra Aji Parama. Yogyakarta.
- Ultralytics. 2024. YOLOv10 vs. YOLOv9: A technical comparison. Ultralytics Docs. Diakses 19 Agustus 2025, dari <https://docs.ultralytics.com/compare/yolov10-vs-yolov9/>
- Ummami, R., Ramandani, D., Airin, C. M., Husni, A., dan Astuti, P. 2022. Uji Kualitas dan Uji Cemaran Daging Babi Pada Daging Sapi di Beberapa Pasar Tradisional di Yogyakarta. *Jurnal Ilmu Peternakan dan Veteriner Tropis*, Vol. 12 No. 2, pp 151 – 160.
- Undang-Undang Republik Indonesia Nomor 8 Tahun 1999 Tentang Perlindungan Konsumen.
- Upadhyay, A., GC, S., Das, S., Mettler, J., Howatt, K., & Sun, X. 2025. Multiclass weed and crop detection using optimized YOLO models on edge devices.

Journal of Agriculture and Food Research, 22, 102144.
[DOI:10.1016/j.jafr.2025.102144]

- Utami, S. T., Kusharyati, D. F., dan Pramono, H. 2013. Pemeriksaan Bakteri *Leptospira* pada Sampel Darah Manusia Suspect Lemptospirosis Menggunakan Metode PCR (Polymerase Chain Reaction). *Balaba* vol.9 no.02 (2013): 74-81.
- Voigtlaender, P., Weng, L., Amende, K., Al-Halah, Z., Leibe, B., & Schindler, K. 2021. Revisiting Annotation Quality for Object Detection. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* (pp. 11599-11608). DOI: 10.1109/CVPR46437.2021.01166.
- Waskito, D., Syarifah, D. F., & Aprilianto, R. A. 2025. Comparison of the Use of YOLOv11 Variations in the Empty Parking Spaces Detection System. *Saintekno*, 23(1), 1–10.
- Widati, A.S., Mustakim dan Indriana, S. 2007. Pengaruh Lama Pengapuran Terhadap Kadar Air, Kadar Protein, Kadar Kalsium, Daya Kembang Dan Mutu Organoleptik Kerupuk Rambak Kulit Sapi. *Jurnal Ilmu dan Teknologi Hasil Ternak*, 2(1), pp. 47-56.
- Wijaya, A., Akbar, D. Y., & Khairunnisa, A. 2024. Autentikasi Produk Pangan Halal Menggunakan Metode PCR (Polymerase Chain Reaction). *Indonesian Journal of Halal*, 7(1), 70-80.
- Wu, C., Luo, Q., & Shou, D. 2022. Image Recognition Technology and Development of YOLO Algorithm. In J. Xu (Ed.), *Mechatronics and Automation Technology*. IOS Press.
- Yuliana, A., dan Fathurohman, M. 2020. Teori Dasar dan Implementasi Perkembangan Biologi Sel dan Molekuler di CV. Jakad Media Publishing, Surabaya.
- Yusuf, Z. K. 2010. *Polymerase Chain Reaction (PCR)*. *Jurnal Saintek*, 5(6):1-6.
- Yuwono, T. 2015. *Biologi Molekular*. Erlangga. Jakarta.
- Zhao, L., & Li, S. 2020. Object Detection Algorithm Based on Improved YOLOV3. *Electronics*, 9(3), 537.
- Zhou, K. and Jiang, S. 2025. Forest Fire Detection Algorithm Based on Improved YOLOv11n, *Sensors*, 25(10), p. 2989.
- Zilhadia, Adhiyanto, C., Fajrin, A. G., dan Khairunnisa, N. 2020. Analisis Cemaran Daging Babi pada Bakso Sapi yang Dijual di Tanjung Priok menggunakan *Real-Time Polymerase Chain Reaction (RT-PCR)*. *Jurnal Sains Farmasi dan Klinik* Vol. 7, No. 1.
- Zulfarina, dan Mahadi, I., 2019. *Buku Ajar Bioteknologi*. UR Press. Pekanbaru.