

DAFTAR PUSTAKA

- ACS Sustainable Chemistry & Engineering (2020). *A new spectrophotometric assay for measuring the hydrolytic activity of lipase from Thermomyces lanuginosus using p-nitrophenyl palmitate*. *ACS Sustainable Chem. Eng.* 8(12),4818–4826. <https://doi.org/10.1021/acssuschemeng.9b07543>
- Anggraeni, D. P., Ali, M., Haris, A., & Amin, M. (2020). Pengaruh suplementasi *Lactobacillus plantarum* terhadap pertumbuhan dan kelangsungan hidup ikan nila. *Journal of Aquaculture and Fish Health*, 9(1). <https://doi.org/10.20473/jafh.v9i1.15367>
- Arifaddini, W., Yudasmara, G. A., & Maharani, M. D. K. (2025). Kualitas Air Media Budidaya Nila (*Oreochromis niloticus*): Efek Pakan Bersinbiotik EM4 dan Tepung Ubi Jalar (*Ipomoea batatas* L.). *ACROPORA: Jurnal Ilmu Kelautan dan Perikanan Papua*, 8(2), 53–61.
- Arifaddini, W., Yudasmara, G. A., & Maharani, M. D. K. (2025). Kualitas air Media Budidaya Nila (*Oreochromis niloticus*): Efek pakan Bersinbiotik EM4 dan Tepung Ubi Jalar (*Ipomoea batatas* L.). *Jurnal Ilmu Kelautan dan Perikanan Papua*, 8(2), 53-61.
- Azzahra, A., Sari, N. P., & Hidayat, R. (2025). Aktivitas enzim amilase, lipase dan protease pada probiotik indigenus kelompok *Lactobacillus casei*. *Jurnal Kaunia*, 17(1), 110.
- Dadkhodazadeh, V., Mollaei, M., Nateghi, L., & Mirghaed, A. T. (2024). Improvement of the valuable compounds of fish waste by fermentation with probiotics and evaluation of the antioxidant activity. *Food Science & Nutrition*, 12(5), 3345-3356. <https://doi.org/10.1002/fsn3.4046>
- El-Sayed, A. M., Tammam, M. S., and Makled, S. O. (2021). Lecithin-containing bioemulsifier boosts growth performance, feed digestion and absorption and immune response of adult Nile tilapia (*Oreochromis niloticus*). *Aquaculture Nutrition*, 27(3), 757-770. <https://doi.org/10.1111/anu.13221>
- Eskandari, A., Leow, T. C., Abdul Rahman, M. B., & Oslan, S. N. (2024). Recent insight into the advances and prospects of microbial lipases and their potential applications in industry. *International Microbiology*, 27, 1597–1631. <https://doi.org/10.1007/s10123-024-00498-7>
- Gao, H., Wu, X., Li, X., Zhang, X., Zhang, S., Yang, J., ... & Zhao, L. (2022). The functional roles of *Lactobacillus acidophilus* in different physiological and pathological processes. *Journal of Microbiology and Biotechnology*, 32(10), 1226-1233. <https://doi.org/10.4014/jmb.2206.06034>

- Glogauer, A., Martini, V. P., Faoro, H., Couto, G. H., Müller-Santos, M., Monteiro, R. A., ... & Pedrosa, F. O. (2011). Identification and characterization of a new true lipase isolated through metagenomic approach. *Microbial Cell Factories*, 10(1), 54. <https://doi.org/10.1186/1475-2859-10-54>
- García-Cano, I., Rocha-Mendoza, D., Ortega-Anaya, J., Santos-Moreno, P., & Pérez-Moreno, J. (2019). Lactic acid bacteria isolated from dairy products as potential producers of lipolytic, proteolytic and antibacterial proteins. *Applied Microbiology and Biotechnology*, 103(19), 7833-7846. <https://doi.org/10.1007/s00253-019-09844-6>
- Guan, C., Tao, Z., Wang, L., Zhao, R., Chen, X., Huang, X., ... & Gu, R. (2020). Isolation of novel *Lactobacillus* with lipolytic activity from the vinasse and their preliminary potential using as probiotics. *AMB Express*, 10(1), 91. <https://doi.org/10.1186/s13568-020-01026-2>
- Guan, C., Zhao, K., Sun, Y., & Hou, Y. (2020). Isolation of novel *Lactobacillus* with lipolytic activity from the vinasse and their preliminary potential using in food industry. *AMB Express*, 10, Article 102. <https://pmc.ncbi.nlm.nih.gov/articles/PMC7229107/>
- Guo, J., Chen, C.-P., Wang, S., & Huang, X. (2015). A convenient test for lipase activity in aqueous-based solutions using *p*-nitrophenyl palmitate. *Enzyme and Microbial Technology* 71. <https://pubmed.ncbi.nlm.nih.gov/25765304/>
- Gupta, N., Rathi, P., & Gupta, R. (2002). Simplified para-nitrophenyl palmitate assay for lipases and esterases. *Analytical biochemistry*, 311(1), 98-99.
- Hidayat, R., *et al.* (2019). Karakterisasi lipase termostabil (isolat AL96) berdasarkan parameter temperatur dan pH pada industri makanan. *Jurnal Teknologi dan Industri Pangan*, 30(2), 89–96.
- Li, B., Wang, Y., Chen, Y., Yang, X., Chen, Y., & Wu, J. (2025). Application status and development prospect of fermented ingredients in aquaculture. *Animal Nutrition*, 20, 228-245. <https://doi.org/10.1016/j.aninu.2024.11.008>
- Fathi, F., Mobarak Qamsari, E., Kasra Kermanshahi, R., Moosavi-Nejad, Z., & Ghashghaei, T. (2022). Optimization of Lipase Production by a Newly Isolate of *Lactobacillus fermentum*. *Iranian Journal of Science and Technology, Transactions A: Science*, 46(4), 1103-1113. <https://doi.org/10.1007/s40995-022-01322-5>
- Liang, Y., Wang, Y., & Zhang, Y. (2022). Dietary lipid levels affect growth performance and digestive enzyme activity in juvenile fish. *Aquaculture Reports*, 23, 101045. <https://doi.org/10.1016/j.aqrep.2021.101045>
- Manasian, P., *et al.* (2020). First Evidence of Acyl-Hydrolase/Lipase Activity From Human Probiotic Bacteria: *Lactobacillus rhamnosus* GG and *Bifidobacterium longum* NCC 2705. *Frontiers in Microbiology*, 11, 1534.

- Martínez Cruz, P., Ibáñez, A. L., Monroy Hermosillo, O. A., & Ramírez Saad, H. C. (2022). Use of probiotics in aquaculture. *Aquaculture Reports*, 24, 101123. <https://doi.org/10.1016/j.aqrep.2021.101123>
- Martini, N. N. D. (2024). Komparasi Kinerja Pertumbuhan Ikan Nila (*Oreochromis niloticus*) pada Sistem Resirkulasi dengan Media Filter yang Berbeda. *Jurnal Pendidikan Biologi Undiksha*, 11(1).
- Martini, N. N. D. (2024). Komparasi kinerja pertumbuhan ikan nila (*Oreochromis niloticus*) pada sistem resirkulasi dengan media filter yang berbeda. *Jurnal Pendidikan Biologi Undiksha*, 11(1), 15-25.
- Munguti, J., Muthoka, M., Chepkirui, M., Kyule, D., Obiero, K., Ogello, E., ... & Kwikiriza, G. (2024). The fish feed sector in Kenya, Uganda, Tanzania, and Rwanda: current status, challenges, and strategies for improvement—a comprehensive review. *Aquaculture Nutrition*, 2024(1), 8484451. <https://doi.org/10.1155/2024/8484451>
- Neves, N. O. D. S., Nascimento, D. S., Vieira, F. N., Martins, M. L., Mourino, J. L. P., & Pedrotti, F. S. (2024). Fermentation of plant-based feeds with *Lactobacillus acidophilus* improves the survival and intestinal health of juvenile Nile tilapia (*Oreochromis niloticus*) reared in a biofloc system. *Fishes*, 9(1), 28. <https://doi.org/10.3390/fishes9010028>
- Pertiwi, N. P. D. (2022). Identifikasi Spesies Ikan Pelagis yang Dijual di Pasar Kota Denpasar Menggunakan Marka Control Region Mitokondria (mtDNA). *Jurnal Pendidikan Biologi Undiksha*, 9(1), 95–102.
- Pertiwi, N. P. D. (2022). Identifikasi spesies ikan pelagis yang dijual di pasar kota Denpasar menggunakan marka control region mitokondria (mtDNA). *Jurnal Pendidikan Biologi Undiksha*, 9(1), 95-102
- Pradana, D. A. (2020). Pengaruh Penambahan Probiotik Pada Pakan Terhadap Kelangsungan Hidup dan Pertumbuhan Ikan.
- Prasetia, I. N. D., Setiabudi, I. G. I., Antara, K. L., Amelia, J. M., & Saraswati, N. L. P. A. (2022). Pemetaan Potensi Bambu Laut (*Isis* sp.). *JST (Jurnal Sains dan Teknologi)*, 11(2), 426–431.
- Prasetia, I. N. D., Setiabudi, I. G. I., Antara, K. L., Amelia, J. M., & Saraswati, N. L. P. A. (2022). Pemetaan Potensi Bambu Laut (*Isis* sp.). *JST (Jurnal Sains dan Teknologi)*, 11(2), 426-431.

- Putra, A. G., *et al.* (2015). Pengaruh penambahan enzim fitase pada pakan buatan terhadap efisiensi pemanfaatan pakan dan pertumbuhan ikan kerapu bebek (*Cromileptes altivelis*). *Jurnal Akuakultur Tropika*, 6(2), 101–108.
- Putri, R. A., & Hafsan, M. (2025). Enzim lipase: Peran dan aplikasinya dalam industri pangan (sebuah mini review). *Bioharmony: Jurnal Biologi dan Pembelajarannya*, 2(1), 1–8.
- Rahayu, S., Amoah, K., Huang, Y., Cai, J., Luo, L., Tang, R., ... & Lu, Y. (2024). Probiotics application in aquaculture: Its potential effects, current status in China and future prospects. *Frontiers in Marine Science*, 11, 1455905. <https://doi.org/10.3389/fmars.2024.1455905>
- Rashmi, B. S., & Gayathri, D. (2014). Partial purification, characterization of *Lactobacillus* sp. G5 lipase and their probiotic potential. *International Food Research Journal*, 21(5), 1737–1743.
- Sari, N. P., Suharman, I., & Andayani, S. (2020). Aktivitas enzim lipase *Lactobacillus plantarum* dari usus ikan lele. *Jurnal Akuakultur Indonesia*, 19(1), 1–8. <https://doi.org/10.19027/jai.19.1-8>
- Shah, H., Zhang, C., Khan, S., Patil, P. J., Li, W., Xu, Y., Ali, A., & Liang, E. (2024). Comprehensive insights into microbial lipases: Unveiling structural dynamics, catalytic mechanism, and versatile applications. *Current Microbiology*, 81, Article 394. <https://doi.org/10.1007/s00284-024-03904-5>
- Siddik, M. A. B., Julien, B. B., Islam, S. M. M., Howieson, J., & Fotedar, R. (2024). Fermentation in aquafeed processing: Achieving sustainability in feeds for global aquaculture production. *Reviews in Aquaculture*, 16(2), 760–783. <https://doi.org/10.1111/raq.12894>
- Sumerianz Journal of Biotechnology (2020). *Lipase assay: determination by p-nitrophenyl palmitate hydrolysis method*.
- Surianti, F., Muaddama, F., Wahyudi, W., & Firman, S. W. (2020). Pengaruh dedak padi terfermentasi dengan *Lactobacillus* sp. terhadap pertumbuhan dan aktivitas enzim ikan nila. *Jurnal Ikhtiologi Indonesia*, 20(2). <https://doi.org/10.32491/jii.v20i2.1234>
- Tallei, T. E., *et al.* (2020). Seleksi probiotik *Lactobacillus* sp. dari usus ikan mas (*Cyprinus carpio*). *Jurnal Budidaya Perairan*, 8(2), 45–52.
- Telaumbanua, A., Sari, N. P., & Hidayat, R. (2020). Pengaruh konsentrasi dedak padi terfermentasi menggunakan *Lactobacillus* sp. dalam pakan buatan terhadap aktivitas enzim ikan nila. *Jurnal Ikhtiologi Indonesia*, 20(3), 123–130.

Telaumbanua, B. V., Telaumbanua, P. H., Lase, N. K., & Dawolo, J. (2020). Penggunaan probiotik EM4 pada media budidaya ikan: Review. Universitas Nias.

Wirantari, A. P., & Marantika, A. K. (2023). Fermented Feed: Komparasi Lama Fermentasi Larutan Daun Singkong (Manihot utilissima) Terhadap Laju Pertumbuhan dan Sintasan Ikan Nila (Oreochromis niloticus). JST (Jurnal Sains Dan Teknologi), 12(2), 327-334.

Wirantari, A. P., Marantika, A. K., & Sitepu, G. S. B. (2023). Fermented Feed: Komparasi Lama Fermentasi Larutan Daun Singkong (Manihot utilissima) Terhadap Laju Pertumbuhan dan Sintasan Ikan Nila (Oreochromis niloticus). Jurnal Sains dan Teknologi, 12(2), 327–334.

Yang, Z., Liu, P., Kong, Q., Deng, Y., Zhang, W., Xu, G., & Tang, H. (2023). Effects of co-fermented feed using *Lactobacillus acidophilus*, *Limosilactobacillus reuteri* and *Lactiplantibacillus plantarum* on growth, antioxidant capacity, fatty acids and gut microbiota of largemouth bass (*Micropterus salmoides*). *Animals*, 13(16), 2664. <https://doi.org/10.3390/ani13162664>

