

DAFTAR PUSTAKA

- Ababboa, E. D., Workagegn, K. B., Yimer, G. T., & Amare, T. A. (2014). Growth performance of the Nile tilapia (*Oreochromis niloticus* L.) fed different types of diets formulated from varieties of feed ingredients. *Journal of Aquaculture Research & Development*, 5(3), 1-4.
- Abd El-Hack, M. E., El-Saadony, M. T., Nader, M. M., Salem, H. M., El-Tahan, A. M., Soliman, S. M., & Khafaga, A. F. (2022). Effect of environmental factors on growth performance of Nile tilapia (*Oreochromis niloticus*). *International Journal of Biometeorology*, 66(11), 2183-2194.
- Abdel Rahman, A., Hassanin, M., & ElHady, M. (2019). Growth performance, haematology and intestinal histo-morphology of Nile tilapia fed on Indian Lotus (*Nelumbo nucifera* Gaertn.) leaf powder at different concentrations. *Aquaculture Research*, 50(11), 3211-3222.
- Abdel-Aziz, S. H., Basyony, M. M., Soliman, M. A., & El-Gamal, A. A. (2023). Growth Performance, Feed Utilization, Hematological Parameters, and Histological Features of Nile Tilapia (*Oreochromis niloticus*) Fed Diets with Supplementary Herbal Extracts Under Prolonged Water Exchange. *Annals of Animal Science*, 23(1), 147–158.
- Abdo, S. E., El-Nahas, A. F., Abdelmenam, S., Elmadawy, M. A., Mohamed, R., Helal, M. A., & El-Kassas, S. (2022). The synergetic effect of *Bacillus* species and *Yucca shidigera* extract on water quality, histopathology, antioxidant, and innate immunity in response to acute ammonia exposure in Nile tilapia. *Fish & Shellfish Immunology*, 128, 123-135.
- Adeoye, A. A., Jaramillo-Torres, A., Fox, S. W., Merrifield, D. L., & Davies, S. J. (2016). Supplementation of formulated diets for tilapia (*Oreochromis niloticus*) with selected exogenous enzymes: Overall performance and effects on intestinal histology and microbiota. *Animal Feed Science and Technology*, 215, 133-143.
- Adjanke, A., Tona, K., Toko, I.I., & Gbeassor, M. (2021). Effect of palm kernel meal (*Elaeis guineensis*, Jacq, 1763) in the diet on digestive transit and some serum parameters in Nile Tilapia (*Oreochromis niloticus*, Linnaeus, 1758). *International journal of Biological and Chemical Science*. 15(5),1725-1723.
- Ali, M. A. M., & El-Feky, A. M. I. (2013). Effect of different photo periods on growth performance, survival rate and skin colour of Nile tilapia fingerlings. *Egyptian Journal of Animal Production*, 50(3), 186-192.
- Ayisi, C. L., Zhao, J., & Rupia, E. J. (2017). Growth performance, feed utilization,

body and fatty acid composition of Nile tilapia (*Oreochromis niloticus*) fed diets containing elevated levels of palm oil. *Aquaculture and Fisheries*, 2(2), 67-77.

- Amalia, R., Amrullah, & Suriati. 2018. Manajemen pemberian pakan pada pembesaran ikan nila (*Oreochromis niloticus*). *Prosiding Seminar Nasional Politeknik Pertanian Negeri Pangkajene Kepulauan*, 1, 55-61.
- Ambarwati, N., & Mutjahidah, T. 2021. Teknik pembenihan ikan nila (*Oreochromis niloticus*) di Laboratorium Pengujian Kesehatan Ikan dan Lingkungan Ambarawa, Kabupaten Semarang, Jawa Tengah. *Manfish Journal*, 2(1), 16-21.
- Akmal, Y., Devi, S. M. C., Muliari, M., Humairani, R., & Zulfahmi, I. 2021. Morfometrik sistem pencernaan ikan nila (*Oreochromis niloticus*) yang dipapar limbah cair kelapa sawit. *Jurnal Galung Tropika*. 10(1), 68-81
- Arifin, M. Y. 2016. Pertumbuhan dan *survival rate* ikan nila (*Oreochromis niloticus*) strain merah dan strain hitam yang dipelihara pada media bersalinitas. *Jurnal Ilmiah Universitas Batanghari Jambi*, 16(1), 160-161.
- Azhari, D., & Tomaso, M. A. 2018. Kajian kualitas air dan pertumbuhan ikan nila (*oreochromis niloticus*) yang dibudidayakan dengan sistem akuaponik. *Jurnal akuatika Indonesia*. 3 (2), 84-90.
- Bahnasawy, M. H., El-Ghobashy, A. E., El-Ebiary, E. S. H., Helal, A. M., & El-Sisy, D. M. (2020). Effect of probiotic on water quality, growth performance and body composition of Nile tilapia (*Oreochromis niloticus*). *International Journal of Fisheries and Aquatic Studies*, 8(1), 86-91.
- Bowyer, P. H., El-Haroun, E. R., Salim, H. S., & Davies, S. J. (2020). Benefits of a commercial solid-state fermentation (SSF) product on growth performance, feed efficiency and gut morphology of juvenile Nile tilapia (*Oreochromis niloticus*) fed different UK lupin meal cultivars. *Aquaculture*, 523, 735192.
- Bhagawati, D., Rachmawati, N, F., Rukayah, S. 2017. Karakteristik diformisme dan gambaran histologis gonad pada benih ikan nila hasil alih kelamin. Fakultas Biologi, Universitas Jenderal Soedirman. 1-11.
- Bullerwell, C. N., Collins, S. A., Lall, S. P., & Anderson, D. M. 2016. Growth performance, proximate and histological analysis of rainbow trout fed diets containing *Camelina sativa* seeds, meal (*high-oil* and *solvent-extracted*), and oil. *Aquaculture*, 452: 342–350.
- Bokau, R. J. M., & Basuki, T. P. 2018. Bungkil inti sawit sebagai media biokonversi produksi massal larva maggot dan uji respon pemberian pada ikan nila

- (*Oreochromis niloticus*). *Prosiding Seminar Nasional Politeknik Negeri Lampung*. 122-128.
- Bobina, B., & Prasad, G. (2015). Histological studies on the intestine of *Horabagrus brachysoma* (Gunther). *Journal of Advanced Zoology Studies*, 3(2), 56–61.
- Cahyanti, Y., & Awalina, I. Studi literature: Pengaruh suhu terhadap ikan nila (*Oreochromis niloticus*). *Panthera: Jurnal Ilmiah Pendidikan Sains dan Terapan*. 2(4), 224-235
- Cholilulloh, M., Syauby, D., & Tibyani. 2018. Implementasi metode fuzzy pada kualitas air kolam bibit lele berdasarkan suhu dan kekeruhan. *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, 2(5), 1813-1822.
- Cahyadi, A. R., & Zulkarnain. 2021. Application of aeration injection to increase dissolved oxygen of surface water in the floating net cage. *IOP Conference Series: Earth and Environmental Science*, 934, 012069.
- Damanik, M., Kusdianto, H., Hardi, H. E., Pagoray, H., & Isriansyah. 2023. Pengaruh penambahan bungkil inti sawit fermentasi terhadap konversi pakan dan pertumbuhan ikan kelabau (*Osteochilus melanopleurus*). *Jurnal Akuakultur Sungai dan Danau*. 8(2).
- Daudpota, A. M., Abbas, G., Kalhor, I. B., Shah, S. S. A., Kalhor, H., Hafeez-ur-Rehman, M., & Ghaffar, A. (2016). Effect of feeding frequency on growth performance, feed utilization and body composition of juvenile Nile tilapia, *Oreochromis niloticus* (L.) reared in low salinity water. *Pakistan Journal of Zoology*, 48(1).
- Dawood, M. A., Gewaily, M., & Sewilam, H. (2023). Combined effects of water salinity and ammonia exposure on the antioxidative status, serum biochemistry, and immunity of Nile tilapia (*Oreochromis niloticus*). *Fish Physiology and Biochemistry*, 49(6), 1461-1477.
- Dee, M. M., Leungaruemitchai, A., Suebsong, W., Somjai, D., Nimnual, K., Abdurahman, L., & Nganing, K. (2021). A comparative growth performance and survival of different genetic strains of Nile tilapia (*Oreochromis niloticus*) and Red tilapia (*Oreochromis spp.*) in a floating net cage culture farming in the Cirata Lake, West Java, Indonesia. *Thai Journal of Agricultural Science*, 54(4), 280–293.
- Djaelani, A. M., Yuliana, S., Kasiyati., Sunarno. (2023). Morfometri traktus alimetarius ikan nila merah (*Oreochromis niloticus*) yang dipelihara dengan aerator dan filter berbeda. *Buletin anatomi dan fisiologi*. Vol 8, 1.
- El-Desouky, F. F., Ibrahim, M. A., Abd El-Razek, I. M., El-Nabawy, E. S. M., Amer,

- A. A., Zaineldin, A. I., & Dawood, M. A. (2024). Improving yellow mealworm (*Tenebrio molitor*) utilization with Sodium Butyrate in Nile Tilapia diets: effects on Growth Performance, Intestinal Histology, Antioxidative Response, and blood biomarkers. *Aquaculture Nutrition*, 2024(1), 2442308.
- El-Kassas, S., Hamed, S., Abo-Al-Ela, H. G., Abdo, S. E., Abou-Ismael, U. A., & Mohamed, R. A. (2024). Temperature and feeding frequency: interactions with growth, immune response, and water quality in juvenile Nile tilapia. *BMC Veterinary Research*, 20(1), 520.
- Elsabagh, M., Mohamed, R., Moustafa, E. M., Hamza, A., Farrag, F., Decamp, O., & Eltholth, M. (2018). Assessing the impact of Bacillus strains mixture probiotic on water quality, growth performance, blood profile and intestinal morphology of Nile tilapia, *Oreochromis niloticus*. *Aquaculture nutrition*, 24(6), 1613-1622.
- Esam, F., Khalafalla, M. M., Gewaily, M. S., Abdo, S., Hassan, A. M., & Dawood, M. A. (2022). Acute ammonia exposure combined with heat stress impaired the histological features of gills and liver tissues and the expression responses of immune and antioxidative related genes in Nile tilapia. *Ecotoxicology and environmental safety*, 231, 113187.
- Emam, S. M., Mohammadian, B., Mohammadian, T., & Tabande, M. R. (2024). Autochthonous probiotic bacteria improve intestinal pathology and histomorphology, expression of immune and growth-related genes and resistance against *Vibrio alginolyticus* in Asian seabass (*Lates calcarifer*). *Veterinary Research Communications*, 48(5), 3209-3227.
- Fauzia, S. R., & Suseno, S. H. 2020. Resirkulasi air untuk optimalisasi kualitas air budidaya ikan nila Nirwana (*Oreochromis niloticus*). *Jurnal Pusat Inovasi Masyarakat*, 2(5), 887–892.
- Fadel, K. A., El-Sayed, H. S., Barakat, K. M., El-Bermawi, N., Massoud, R. G., Abouelkheir, S. S., & Ghanem, S. F. (2024). Effect of Different Intensities of Magnetized Water on Histological Characteristics and Growth Performance of the Sea Bream (*Sparus aurata*) Juveniles. *Egyptian Journal of Aquatic Biology & Fisheries*, 28(1).
- Fahla, N. A., Abdelrazek, H., Fouad, A. S., Helmy, S. A., Soliman, M. T., Badawy, L. A., & El-Shenawy, N. S. (2025). Dietary grape seed extract mitigated growth retardation, hormonal delay, and gastrointestinal toxicity induced by insecticide imidacloprid in Nile tilapia. *Fish Physiology and Biochemistry*, 51(2), 1-20.

- Fayed, W. M., Mansour, A. T., Zaki, M. A., Omar, E. A., Nour, A. M., Taha, E. M., & Sallam, G. R. (2024). Water quality change, growth performance, health status in response to dietary inclusion of black soldier fly larvae meal in the diet of Nile tilapia, *Oreochromis niloticus*. *Annals of Animal Science*, 24(2), 533-544.
- Gad, S. A., Mostafa, D. I., Megahed, H. M., Bakry, M. A., Mokhbatly, A. A. A., & Mowafy, R. E. (2024). Impact of Partial Substitution of Soybean Meal by Cottonseed Meal with Iron Sulfate Supplementation in Nile Tilapia Diet. *Aquaculture Studies*, 24(6).
- Ghozali, I. 2016. *Aplikasi Analisis Multivariate dengan Program IBM SPSS 25*. Semarang: Badan Penerbit Universitas Diponegoro.
- Gong, L., Liu, F., Liu, J., Wang, J. 2024. Dietary fiber (Oligosaccharide and non-starch polysaccharide) in preventing and treating function gastrointestinal disorders. *International Journal of Biological Macromolecules*. Volume 258, 1.
- Hadijah, S., Jayadi, H., Harlia, & Nurkhaliza, I. 2019. Efektivitas pakan dari bungkil kelapa sawit terhadap sintasan dan pertumbuhan ikan nila (*Oreochromis niloticus*). *Journal of Indonesian Tropical Fisheries*. 2,1: 32-42.
- Hamed, S. A., Abou-Elnaga, A., Salah, A. S., Abdel-Hay, A. H. M., Zayed, M. M., Soliman, T., & Mohamed, R. A. (2021). Effect of water temperature, feeding frequency, and protein percent in the diet on water quality, growth, and behavior of Nile tilapia *Oreochromis niloticus* (Linnaeus, 1758). *Journal of Applied Ichthyology*, 37(3), 462-473.
- Hanan, M. Y., Amatul-Samahah, M. A., Jaapar, M. Z., & Mohamad, S. N. (2022). The effects of field cricket (*Gryllus bimaculatus*) meal substitution on growth performance and feed utilization of hybrid red tilapia (*Oreochromis spp.*). *Applied Food Research*, 2(1), 100070.
- Hasyim, Koniyo, Y., & Karim, F. 2015. Parameter fisik-kimia perairan. *Jurnal Ilmiah Perikanan dan Kelautan*, 3(4), 130-136
- Indriati, A. P., & Hafiludin. 2022. Manajemen kualitas air pada pembenihan ikan nila (*Oreochromis niloticus*) berbagai ukuran bobot yang dipelihara pada salinitas air laut. *Media Akuatika*, 1(4),19-24
- Ibrahim, M. S., El-gendy, G. M., Ahmed, A. I., Elharoun, E. R., & Hassaan, M. S. (2021). Nanoselenium versus bulk selenium as a dietary supplement: Effects on growth, feed efficiency, intestinal histology, haemato-biochemical and oxidative stress biomarkers in Nile tilapia (*Oreochromis niloticus* Linnaeus, 1758) fingerlings. *Aquaculture Research*, 52(11), 5642-5655.

- Jastaniah, S. D., Alaidaroos, B. A., Shafi, M. E., Aljarari, R. M., Abd El-Aziz, Y. M., Munir, M. B., ... & Said, R. M. (2024). Dietary *Pediococcus acidilactici* improved the growth performance, feed utilization, gut microbiota, and disease resistance against *Fusarium solani* in Pacific white shrimp, *Litopenaeus vannamei*. *Aquaculture International*, 32(3), 3195-3215.
- Juanda, J, S & Edo, I,S. (2021). Histopatologi organ usus ikan nila (*Oreochromis niloticus*) yang diambil dari pembudidayaan ikan di Kota Kupang, Nusa Tenggara Timur. *JVIP*, 1(2):20-24.
- ITIS (Integrated Taxonomic Information. 2025. *Oreochromis niloticus* (Linnaeus, 1758). Diakses pada 14 Maret 2025 dari <https://www.itis.gov>.
- Jayadi, M. 2021. Pengaruh pemberian pakan berbasis protein nabati terhadap pertumbuhan dan kesehatan ikan nila (*Oreochromis niloticus*). *Jurnal Budidaya Perikanan*, 5(2), 123-130.
- Jastaniah, S, D., Alaidaroos, B, A. Shafi, M, E., Aljarari, R, M., Aziz, A., Munir, M, Y., Said, R, M. (2024). Dietary *Pediococcus acidilactici* improved the growth performance , feed utilization, gut microbiota, and disease, resistance against *Fusarium solani* in Pacific white shrimp, *Litopenaeus vannamei*. *Aquaculture International*, 32(3), 3195-3215.
- Juliantoni, J. Mucra, A. Febrina, D. 2018. Kandungan nutrisi serat buah kelapa sawit yang difermentasi dengan feses kerbau pada level yang berbeda. *Jurnal Peternakan*. Fakultas pertanian dan peternakan, Universitas Islam Negeri Sultan Syarif Kasim Riau. Vol 15, 37-46.
- Juarez, R, J., Pinares, R., Smith, E, C., Llerena, A, C., Machaca, V., Pizzaro, M, D. 2023. Microencapsulated essential oils influence the growth and foregut histomorphometry of nile tilapia (*Oreochromis niloticus*) fingerlings. *Vet anim Sci*.
- Kawanishi, K. (2016). Diverse properties of the mesothelial cells in health and disease. *Pleura and Peritoneum*, 1(2), 79–89
- Khairunnisa, Sofyan, R. P., & Abidin, L. D. B. 2019. Uji adaptasi benih ikan nila merah (*Oreochromis niloticus*) berbagai ukuran bobot yang dipelihara pada salinitas air laut. *Media Akuatika*, 1(4), 19-24.
- Khoirunisa. 2021. Studi kasus kesesuaian kualitas air kolam untuk budi daya ikan nila (*Oreochromis niloticus*) di Desa Menggoro Kabupaten Temanggung Jawa Tengah. Program Studi Akuakultur, Fakultas Pertanian, Universitas Tidar.
- Labaika, R., Agustina, S, S., Tasruddin. Perbedaan warna wadah terhadap pertumbuhan dan sintasan larva ikan nila (*Oreochromis niloticus*). *ZAB*

Journal: Zona Akuatik Banggai. 3(1).

- Koniyo, Y. 2020. Analisis kualitas air pada lokasi budidaya ikan air tawar di Kecamatan Suwawa Tengah. *Jtech.* 8(1),52-58.
- Madan, A., Terzungwe, S., Nenge, J., Akange, T,E. (2024). Comparative morphological study of the gastrointestinal tract of *eutropius niloticus* and *oreochromis niloticus* from lower river Benue, Nigeria. *Innovations in Agriculture.* Vol 8 (1-4).
- Manu, K, R., Mulyantini, N,G,A. & Kallau, N,H,G. (2023). Pakan fermentasi berbasis bahan lokal berbentuk pellet dan tepung terhadap performa, karkas dan organ intestinal ayam broiler. *Jurnal Kajian Veteriner.* Universitas Nusa Cendana.
- Martins, G. B., da Rosa, C. E., Tarouco, F. D. M., & Robaldo, R. B. (2019). Growth, water quality and oxidative stress of Nile tilapia *Oreochromis niloticus* (L.) in biofloc technology system at different pH. *Aquaculture Research*, 50(4), 1030-1039.
- Magouz, I, F., Dawood, O, A, M., Salem, I, F, M., Mohamed, I, A. 2020. The effects of fish feed supplemented with *Azolla* eal on the growth performance, digestive enzyme activity, and health condition of genetically-improved farmed Tilapia (*Oreochromis niloticus*). Departemen of Animal Production, Faculty of Agriculture, Kafrelsheikh University. *Anm, Anim, Sci.* Vol 20, No.3, 1029-1045.
- Marliyati, A, S. Rimbawan. Hariyanti, R. 2021. Karakteristik fisikokimia dan fungsional minyak sawit merah. *JGMI: The journal of indonesian community nutrition.* Departemen Gizi Masyarakat, Fakultas Ekologi Manusia, Institut Pertanian Bogor. Vol 10 (1).
- Mohammady, E. Y., Saleh, R. S., El-Haroun, E., & Hassaan, M. S. (2022). Dietary dried periphyton can improve growth, digestive enzyme, serum biochemical, antioxidant response and intestinal morphometric of Nile tilapia. *Aquaculture Research*, 53(18), 6463-6477.
- Mohamed, K, M., Abdallah, N. Hashim, A, M., Elhafez,A, A,E. 2024. Histological invertigation of the anterior intestine of koi fish (*Cyprinus rubrofuscus*). *International Journal of Comprehensive Veterinary Research.* Departement of histology, faculty of veterinary medicine, Sohag University. Vol. 02, No.2.
- Mulqan, M., Afdhal, S., Rahimi, E., & Dewiyanti, I. 2017. Pertumbuhan dan kelangsungan hidup benih ikan nila gesit (*Oreochromis niloticus*) pada sistem akuaponik dengan jenis tanaman yang berbeda. *Jurnal Ilmiah*

Mahasiswa Kelautan dan Perikanan Unsyiah, 2(1), 183–193.

- Mokhtar, D. M. 2017. *Fish histology from cells to organs*. Apple Academic Press Inc., Oakville.
- Naiel, M. A., Abdelghany, M. F., Khames, D. K., Abd El-hameed, S. A., Mansour, E. M., El-Nadi, A. S., & Shoukry, A. A. (2022). Administration of some probiotic strains in the rearing water enhances the water quality, performance, body chemical analysis, antioxidant, and immune responses of Nile tilapia, *Oreochromis niloticus*. *Applied Water Science*, 12(9), 209.
- Naigaga, S., Natumanya, R., & Kwetegyeka, J. 2017. Assessing the reliability of water-test kits for use in pond aquaculture. *International Journal of Aquaculture*, 7(1), 1-7.
- Nico, L. G., Schofield, P. J., & Neilson, M. E. 2022. *Oreochromis niloticus* (Linnaeus, 1758): U.S. Geological Survey Nonindigenous Aquatic Species Database.
- Nuryaninda, W. 2022. Prevalensi, intensitas endoparasit dan histopatologi pada ikan nila merah (*Oreochromis sp.*) studi kasus di Kelompok Pembudidaya Ikan Sido Makmur, Muntilan, Magelang. Program Studi Akuakultur, Fakultas Pertanian, Universitas Tidar Magelang.
- Nursidi, Ratnasari, Alimuddin, & Yusuf, A. 2020. Aktivitas enzim amilase, lipase, dan protease ikan nila (*Oreochromis niloticus*) yang dipelihara pada air tawar dan payau. *Lutjanus*, 2(25), 60-65.
- Nurhalena, Mardan Adijaya, dan Bambang Kurniadi. 2024. Uji Toksisitas dan Organoleptik dari Limbah Cair Kelapa Sawit pada Benih Ikan Nila (*Oreochromis niloticus*). *ACROPORA: Jurnal Ilmu Kelautan dan Perikanan Papua*. 7 (1).
- Nurhayati., Thaib, A., Handayani, L., Aprizal, T, Y., Syahputra, F., Harun. 2023. Efek suplementasi arang aktif pada pakan terhadap profil histo usus ikan nila (*Oreochromis niloticus*) setelah terpapar insektisida organofosfat. *Jurnal Riset Akuakultur*. 18(1), 27-35.
- Nuryanto, E. 2015. Perkembangan buah kelapa sawit dan kandungan serta komposisi kimianya. *Warta PPKS*. Pusat Penelitian Kelapa Sawit.
- Nawi, F, M. Saad, Z,M., Haiha, N, Y,N., Zuki, B,A,Md., Effendy, M, W,A. 2013. Histological assessments of intestinal immuno-morphology of tiger grouper juvenile, *Epinephelus fuscoguttatus*. *Springer plus*.
- Oliveira, F. C., Kasai, R. Y. D., Fernandes, C. E., Souza da Silva, W., & de Campos,

- C. M. (2022). Probiotic, prebiotic and synbiotics supplementation on growth performance and intestinal histomorphometry *Pseudoplatystoma reticulatum* larvae. *Journal of applied Aquaculture*, 34(2), 279-293.
- Paputungan, F., Pangemanan, N. P. L., Tumbol, R. A., Undap, S. L., Tumembouw, S. S., & Rantung, S. V. 2022. Kajian kualitas air untuk menunjang perikanan budidaya Danau Moaat, Provinsi Sulawesi Utara. *Budidaya Perairan*, 2(10), 134-143.
- Pramleonita, M., Yuliani, N., Afrizal, & Wardoyo, S. E. 2018. Parameter fisika dan kimia air kolam ikan nila hitam (*Oreochromis niloticus*). *Jurnal Sains Natural*, Universitas Nusa Bangsa, 1(8), 24-34.
- Purwani, E., & Hapsari S. W. N. 2011. Pengaruh ekstrak jahe (*Zingiber officinale*) terhadap penghambatan mikroba perusak pada ikan nila (*Oreochromis niloticus*). *Jurnal Kesehatan*, 4(1), 80-91.
- Purnomo, E., Sutrisno, A., & Setiawan, A. 2019. Pengaruh Penggunaan Pakan Mengandung Kelapa Sawit Terhadap Pertumbuhan Ikan Nila (*Oreochromis niloticus*). *Jurnal Akuakultur Indonesia*, 18(2), 123-130.
- Putra, R., & Widodo, E. 2019. Hubungan antara rasio usus dengan pertumbuhan ikan nila. *Jurnal Akuakultur Tropika*. 4(1), 40-46.
- Radwan, M. E., Abd El-Ghany, H. M., Ali, H. M., & El-Attar, H. M. (2022). Growth Performance, Immune Response, Antioxidative Status, and Antiparasitic and Antibacterial Capacity of the Nile Tilapia (*Oreochromis niloticus*) After Dietary Supplementation with Bottle Gourd (*Lagenaria siceraria*, Molina) Seed Powder. *Frontiers in Marine Science*, 9, 901439
- Rahman, M. M., & Fotedar, R. 2017. Histological changes in the digestive system of fish fed with alternative diets. *Aquaculture Nutrition*, 23(1), 785.
- Rozi, Mukti, T. A., Samara, S., & Santanumurti, B. M. 2019. The effect of chitosan in feed on growth, survival rate, and feed utilization efficiency of Nile tilapia (*Oreochromis niloticus*). *Jurnal Perikanan*, Universitas Gadjah Mada, 20(2), 103.
- Rusidi, I., Jailani, & Akhmad. 2022. Pengaruh salinitas air terhadap pertumbuhan ikan nila (*Oreochromis niloticus*) di Desa Panoragan, Kecamatan Loa Kulu, Kabupaten Kutai Kartanegara, Provinsi Kalimantan Timur. *Seminar Nasional Pendidikan Profesi Guru*.
- Rusmiyati, Suminto, & Pinandoyo. 2017. Pengaruh penggunaan tepung bungkil kelapa sawit dalam pakan buatan terhadap efisiensi pemanfaatan pakan dan pertumbuhan ikan nila (*Oreochromis niloticus*). *Journal of Aquaculture*

Management and Technology, 6(4), 182-191.

- Safitri, E., Anggo, D. A., Rianingsih, L. 2023. Pengaruh penambahan tepung ikan nila (*oreochromis niloticus*) terhadap kualitas dan daya terima fish flakes. *Jurnal Ilmu dan Teknologi Perikanan*. 5(1).
- Saleh, E. S., Tawfeek, S. S., Abdel-Fadeel, A. A., Abdel-Daim, A. S., Abdel-Razik, A. R. H., & Youssef, I. M. (2022). Effect of dietary protease supplementation on growth performance, water quality, blood parameters and intestinal morphology of Nile tilapia (*Oreochromis niloticus*). *Journal of Animal Physiology and Animal Nutrition*, 106(2), 419-428.
- Shahabuddin, A. M., Khan, M. N. D., Saha, D., Ayna, E., Wonkwon, K., Murray, W. W., ... & Araki, T. (2015). Length-weight relationship and condition factor of juvenile Nile Tilapia *Oreochromis niloticus* (Linnaeus 1758) Fed Diets with *Pyropia spheroplasts* in closed recirculating system. *Asian Fisheries Science*, 28(3), 117-129.
- Sidiq, M. J., Jayaraj, E. G., Rathore, S. S., Bhat, R. A. H., Mamun, M. A. A., & Khandagale, A. S. (2023). Ameliorative role of dietary acidifier potassium formate on growth metrics, blood chemistry, gut health, and well-being indices of rohu, *Labeo rohita* fingerlings. *Fish Physiology and Biochemistry*, 49(1), 19-37.
- Silva, D.M., Valente, L.M.P., Sousa-Pinto, I. et al. Evaluation of IMTA-produced seaweeds (*Gracilaria*, *Porphyra*, and *Ulva*) as dietary ingredients in Nile tilapia, *Oreochromis niloticus* L., juveniles. Effects on growth performance and gut histology. *J Appl Phycol* 27, 1671–1680 (2015).
- Sotoudeh, E., & Mardani, F. (2018). Antioxidant-related parameters, digestive enzyme activity and intestinal morphology in rainbow trout (*Oncorhynchus mykiss*) fry fed graded levels of red seaweed, *Gracilaria pygmaea*. *Aquaculture Nutrition*, 24(2), 777-785.
- Syanya, F. J., Mahadevan, H., Khanna, A. N., Mathia, W. M., & Mumina, P. (2025). Role of a non-steroidal aromatase inhibitor on growth performance, body composition, reproductive and serum biochemical indices, and intestinal histomorphology in hybrid red tilapia (*Oreochromis spp.*). *Fish Physiology and Biochemistry*, 51(1), 45.
- Saputry, A. M., & Latuconsina, H. 2022. Pembenuhan ikan nila (*Oreochromis niloticus*) di Instalasi Perikanan Budidaya Punten. *Jurnal Riset Perikanan dan Kelautan*, 4(2), 2518.
- Simarmata, D. P., Kudianto, H., & Rizal, S. 2024. Pengaruh konsentrasi EM4 yang berbeda pada fermentasi bungkil inti sawit penyusun pakan terhadap

- konversi pakan dan pertumbuhan ikan nila (*Oreochromis niloticus*). *Jurnal Akuakultur Sungai dan Danau*, 9(2), 142-153.
- Simorangkir, R., Sarjito, & Haditomo, A. H. C. 2020. Pengaruh ekstrak bawang putih (*Allium sativum*) terhadap tingkat pencegahan infeksi bakteri *Vibrio harveyi* dan kelulushidupan ikan nila salin (*Oreochromis niloticus*). *Jurnal Sains dan Akuakultur Tropis*, 4, 68-77.
- Simanjuntak, A. P., & Pramana, R. 2013. Pengontrolan suhu air pada kolam pendederan dan pembenihan ikan nila berbasis Arduino. *Jurnal Hasil Penelitian & Industri Terapan*, 1(4), 1-11.
- Soesilawati, P.2020. Histologi kedokteran dasar. Fakultas kedokteran, Universitas Airlangga.
- Suriana, N. 2019. Budi daya tanaman kelapa sawit. Buana Ilmu populer. *E-books*.
- Sustiawan. 2024. Laju pertumbuhan dan efisiensi pakan ikan nila salin (*Oreochromis niloticus*) yang dipuaskan secara periodik pada wadah terkontrol. Program Studi Budidaya Perairan, Fakultas Pertanian, Universitas Muhammadiyah Makassar.
- Surianti. 2022. Buku ajar: Dasar-dasar akuakultur (budidaya perikanan). Media Sains Indonesia, Bandung.
- Sutarni, A, P., Herawati, E., Budiharjo, A. 2021. Prevalensi endoparasit dan gambaran histopatologi intestinum pada ikan nila, *Oreochromis niloticus* (Linnaeus, 1758) di kolam budi daya di Desa Janti, Kecamatan Polanharjo, Kabupaten Klaten. *Jurnal Iktiologi Indonesia*. Program Studi Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Sebelas Maret. 21(1), 1-10.
- Sundram, K., Sambanthamurthi, R., & Tan, Y. A. (2019). Palm fruit chemistry and nutrition. *Asia Pacific Journal of Clinical Nutrition*, 28(1), 15–27.
- Syuhriatin. 2020. Analisis pertumbuhan ikan nila (*Oreochromis niloticus*) terhadap pemberian pakan yang berbeda (studi kasus: Desa Sigerongan, Kecamatan Lingsar, Kabupaten Lombok Barat). *Open Journal Systems*, 14(6).
- Thongmanee, P., Rattanphan, T., Jansrikong, T., Kaekaew, A., Chuchai, S. 2025. The study of chemical composition and condensed tannin content in forage plants. Rajamangala University of Techonology Srivijaya, Thungyai sub-district.
- Tabassum, T., Mahamud, A. S. U., Acharjee, T. K., Hassan, R., Snigdha, T. A., Islam, T., & Rahman, T. (2021). Probiotic supplementations improve

- growth, water quality, hematology, gut microbiota and intestinal morphology of Nile tilapia. *Aquaculture Reports*, 21, 100972.
- Taufek, N.M., Lim, J.Z.Y., & Bakar, N. A. (2021). *Comparative evaluation of Hermetia illucens larvae reared on different substrates for red tilapia diet: effect on growth and body composition. Journal of Insects as Food and Feed*, 7(1), 79-88.
- Wahdaniyah, N., Nurfaizah, R. M., & Syarif Hidayat Amrullah. 2022. Makanan dan sistem pencernaan ikan. Program Studi Biologi, Fakultas Sains dan Teknologi, Universitas Islam Negeri Alauddin Makassar.
- Wirawan, G. A. 2013. Analisis penerapan biofilter dalam sistem resirkulasi terhadap mutu kualitas air budidaya ikan sidat (*Anguilla bicolor*). *Jurnal Gamma*, 8(2), 86-97.
- Wulansari, K., Razak, A., & Vauziah. 2022. Pengaruh suhu terhadap pertumbuhan ikan lele sangkuriang (*Clarias gariepinus*) dan ikan lele dumbo (*Clarias gariepinus* × *Clarias fuscus*). *E-Journal Universitas Bengkulu*, 18(1).
- Yolanda, S., Rosmaidar., Nazaruddin., Armansyah, T., Balqis, U., Fahrimal, Y. 2017. Pengaruh paparan timbal (Pb) terhadap histopatologis insang ikan nila (*Oreochromis niloticus*). *Jurnal ilmiah veteriner*. 01(4),736-74.
- Younis, E. S. M., Al-Quffail, A. S., Al-Asgah, N. A., Abdel-Warith, A. W. A., & Al-Hafedh, Y. S. (2018). Effect of dietary fish meal replacement by red algae, *Gracilaria arcuata*, on growth performance and body composition of Nile tilapia *Oreochromis niloticus*. *Saudi Journal of Biological Sciences*, 25(2), 198–203.
- Zayed, A., Abdelkareem, S., Talaat, N., Dayem, A, D., Farag, A,M. 2025. Tannin in foods: classification, dietary sources, and processing strategies to minimize anti-nutrient effects. *Food and Bioprocess Technology*, 18: 9221-9249.
- Zeitoun, M. M., EL-Azrak, K. E. D. M., Zaki, M. A., Nemat-Allah, B. R., & Mehana, E. S. E. (2016). Effects of ammonia toxicity on growth performance, cortisol, glucose, and hematological response of Nile Tilapia (*Oreochromis niloticus*). *Aceh journal of animal science*, 1(1), 21-28.
- Zulfahmi, I., Herjayanto,M., Batubara, S., Agung, S., Affandi, R. 2019. Palm kernel meal as a fish-feed ingredient for milkfish (*Chanos chanos*, Forskall 1755): Effect on growth and gut health. Pak. J. Nutr. Departemen of Biology, Faculty of Science and Technology, Ar-Raniry State Islamic University. 18(8): 753-760.