

DAFTAR PUSTAKA

- Abu-Elala, N., M. Marzouk, & M. Moustafa. 2013. Use of different *Saccharomyces cerevisiae* biotic forms as immune-modulator and growth promoter for *Oreochromis niloticus* challenged with some fish pathogens. 1(1): 21-29.
- Adeshina, I., M. I. O. Abubakar, dan B.E. Ajala. 2020. Dietary supplementation with *Lactobacillus acidophilus* enhanced the growth, gut morphometry, antioxidant capacity, and the immune response in juveniles of the common carp, *Cyprinus carpio*. Fish Physiology and Biochemistry. 46(4): 1375–1385.
- Afrilasari, W., Widanarni, & A. Meryandini. 2016. Effect of probiotic *Bacillus megaterium* PTB 1.4 on the population of intestinal microflora, digestive enzyme activity and the growth of catfish (*Clarias* sp.). Journal of Biosciences. 23(4) :168–172
- Aidah, S.N. 2020. Mengenal Lebih Dalam Budidaya Ikan Lele. Penerbit KBM Indonesia, Yogyakarta.
- Ahmad R.Z. 2005. Pemanfaatan khamir *Saccharomyces cerevisiae* untuk Ternak. WARTAZOA. 15(1) : 49-55.
- Ahmadi, H., Iskandar, dan N. Kurniawati. 2012. Pemberian probiotik dalam pakan terhadap pertumbuhan lele sangkuriang (*Clarias gariepinus*) pada pendederan II. Jurnal Perikanan dan Kelautan. 3(4): 99-107.
- Andini, D., M. Zainuddin, Jalaluddin, U. Fitriani, Balqis, N. Asmilia dan Hamdan. 2017. Sebaran sel goblet pada usus lele lokal (*Clarias batrachus*). JIMVET. 1(3): 299-304.
- Ardyanti, R., D.D. Nindarwi, L.A. Sari, , & P.D.W. Sari. 2018. Manajemen pembenihan lele mutiara (*Clarias* sp.) dengan aplikasi probiotik di unit pelayanan teknis pengembangan teknologi perikanan budidaya (UPT PTPB) Kepanjen, Malang, Jawa Timur. Journal of Aquaculture and Fish Health. 7(2): 84-89.
- Arief M., Mufidah dan Kusrieningrum. 2008. Pengaruh penambahan probiotik pada pakan buatan terhadap pertumbuhan dan rasio konversi pakan ikan nila gift (*Oreochromis niloticus*). Berkala Ilmiah Perikanan. 3(2): 53-58.
- Assan, D., F.K.A. Kuebutornye, V. Hlordzi, H. Chen, J. Mraz, U.F. Mustapha, & E.D. Abarike. 2022. Effects of probiotics on digestive enzymes of fish (finfish and shellfish). Biochemistry and Molecular Biology. 257: 1-1-7.
- Büyükdeveci, M. E., I. Cengizler, J.L. Balcázar, & I. Demirkale. 2023. Effects of two host-associated probiotics *Bacillus mojavensis* B191 and *Bacillus subtilis* MRS11 on growth performance, intestinal morphology, expression of immune-related genes and disease resistance of Nile tilapia (*Oreochromis niloticus*) against *Streptococcus iniae*. Developmental & Comparative Immunology. 138: 1-11.
- Bradley C.H., And J. Taylor. 1996. Studies of autolysis : the latent period in autolysis. Journal of Biological Chemical. 25 : 363-375.

- Biermann R., L. Rosner, L. Beyer, L. Niemeyer dan S. Beutel. 2023. Bioprocess development for endospore production by *Bacillus coagulans* using an optimized chemically defined medium. *Engineering* 1-12.
- Casalta, E., dan M.C. Montel. 2008. Safety assessment of dairy microorganism : the *Lactococcus* genus. *International Journal of Food Microbiology*. 126 : 271-273.
- Cruz, P. M., A.L. Ibanez, O. A. M. Hermosillo, dan H. C. R. Saad. 2012. Use Probiotics in Aquaculture. *International Scholarly Research Network Microbiology*.
- Del-Valle, J.C., M.C. Bonadero, & A.V. Fernández-Gimenez. *Saccharomyces cerevisiae* sebagai probiotik, prebiotik, sinbiotik, postbiotik dan parabiotik dalam akuakultur: Suatu Tinjauan. *Budidaya Perairan*. 569 : 1-17.
- Dewanti, A. R., A.O. Putri, I. Istiqomah, & A. Isnansetyo. 2022. Safety, adherence, enzymatic activities, and application effects of oral probiotic candidates for shortfin eel (*Anguilla bicolor bicolor*). *Jurnal Ilmiah Perikanan Dan Kelautan*. 14(2): 203–213.
- Dewi, R.R.S.P.S., dan E. Tahapari. 2017. Pemanfaatan probiotik komersial pada pembesaran ikan lele (*Clarias gariepinus*). *Jurnal Riset Akuakultur* 12(3) : 275-281.
- Diomande S.E, T.C. Nguyen, M.H. Guinebretière, V. Broussolle & J. Brillard. 2015. Role of fatty acids in *Bacillus* environmental adaptation. *Front. Microbiology*. 6(813) : 1-20.
- Doan, H. V., S. H. Hoseinifar, E. Ringo, M. A. Esteban, M. Dadar, M. A. O. Dawood, dan C. Faggio. 2019. Host-associated probiotics: a key factor in sustainable aquaculture. *Reviews in Fisheries Science & Aquaculture*. 28(1): 16-42.
- Effendi, I., A. Tanjung, S. Nedi, S. Nasution dan Elizal. 2019. Teknik pemeliharaan lele dumbo di dalam drum skala rumah tangga. Unilak Press. Pekanbaru.
- Elsabagh M., R. Mohamed., E.M. Moustafa., A. Hamza., F. Farrag., O. Decamp., M.A.O. Dawood and 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.
- Erian, V., Zainuddin, & U. Balqis. 2018. Gambaran luas permukaan vili usus ikan lele lokal (*Clarias batrachus*) jantan Dewasa. *Jimvet*. 2(3): 283–287.
- FAO. 2020. The State of World Fisheries and Aquaculture. Food and Agriculture Organization and World Health Organization, Rome.
- Fatimah, E. N. 2015. Kiat Sukses Budi Daya Ikan Lele. Bibit Publisher, Jakarta.
- Faturrahman. 2013. Seleksi parsial probiotik untuk pertumbuhan Abalon : Isolasi selektif resistensi antibiotik dan patogensitas. *Jurnal Ilmiah Pendidikan Biologi*. 5(1): 1-7.
- Fuller, R. 1987. A review probiotics in man and animals. *Journal of Applied Bacteriology*. 66(5): 365-78.

- Furne, M., Hidalgo., Lopez., G. Gallego, Morales, Domezaline, & Sanzt. 2005. Digestive enzyme activities in Adriatic Surgeon (*Acipenser naccarii*) and rainbow trout (*Onchorynchus mykiss*). *Aquaculture*. 250 : 391:398.
- Gaffar, M.A., M.K. Zaman, M.S. Islam, M. Islam, M.K. Hossain, & S.I.M. Shahriar. 2023. Effects of probiotics on growth, survival, and intestinal and liver morphometry of Gangetic mystus (*Mystus cavasius*). *Saudi Journal of Biological Science*. 30(1) :1-10.
- Gawlicka, M.G., J. Bacon, H.H. Hom, N. Ross, I. Opstad, and O. J. Torrissen. 2000. ctivity of digestive enzymes in yolk-sac larvae of atlantic halibut (*Hippoglossus hippoglossus*): indication of readiness for first feeding. *Aquaculture Journal*. 184: 303-314.
- Ghosh S., A. Sinha., and Sahu. 2008. Dietary probiotic supplementation on growth and health of live-bearing ornamental fishes. *Aquaculture Nutrition*.14(4): 289–299.
- Haetami, K., Y. Mulyani., and A. Aisyah. 2022. Pengaruh induksi probiotik bacillus cgm22 pada pakan terhadap pertambahan bobot ikan dan morfometrik villi usus ikan mas (*Cyprinus carpio*). *Jurnal Perikanan Unram*. 12(3): 395 – 407.
- Hagi, T & T. Hoshino. 2009. Screening and characterization of potential probiotic lactic acid bacteria from cultured common carp intestine. *Bioscience, Biotechnol and Biochemistry*. 73 (7) : 1479–1483.
- Hamza, L.O & N.A. Al-Mansor. 2017. Histological and histochemical observations of the small intestine in the indigenous gazelle (*Gazella subgutturosa*). *Journal of Entomology and Zoology Studies*. 5 (6): 948-956.
- Han, B., W. Long, J. He, Y. Liu, Y. Si, & L. Tian. 2015. Effects of dietary bacillus licheniformis on growth performance, immunological parameters, intestinal morphology and resistance of juvenile nile tilapia (*Oreochromis niloticus*) to challenge infections. *Fish & Shellfish Immunology*. 46(2): 225– 231.
- Haque, M.M., N.A. Hasan, M.M. Eltholth, P. Saha, S.S. Mely, T. Rahman, & F.J. Murray. 2021. Assessing the impacts of in-feed probiotic on the growth performance and health condition of pangasius (*Pangasianodon hypophthalmus*) in a farm trial. *Aquaculture Reports*. 20 : 1-10.
- Helmiati, S., R. Rustadi., A. Isnansetyo dan Z. Zuprizal. 2020. Evaluasi kandungan nutrisi dan antinutrisi tepung daun kelor terfermentasi sebagai bahan baku pakan ikan. *Jurnal Perikanan Universitas Gadjah Mada*. 22(2) : 149-158.
- Hidayat, F. R., dan D. Hariani. 2018. Pemberian dosis fermentor dalam pakan terhadap keberhasilan budidaya ikan lele (*Clarias* sp.). *Sains dan Matematika*. 6(2) : 55-60.
- Husaeni & I.K.A. Sudarmayasa. 2018. Pemberian probiotik pada budidaya udang vaname (*Litopenaeus vannamei*) semi intensif di tambak. *Buletin Teknik Litkayasa Akuakultur*. 16(1): 57-60.
- Irfandi, A., C. D. Iskandar, Zainuddin, D. Masyithass, Fitriani, Hamnywang, & B. Panjaitan. 2019. Histological of tractus digestivus of domestical catfish (*Clarias batrachus*). *Jurnal Medika Veterinaria*. 13(2) : 219–227.

Irianto, A. 2003. Probiotik Akuakultur. Gadjah Mada University Press, Yogyakarta.

Istiqomah, I., I. N. Atitus, A.F. Rohman, & A. Isnansetyo. 2019. Isolation of cellulolytic bacterium *Staphylococcus* sp. JC20 from the intestine of octopus (*Octopus* sp.) for fish probiotic candidate. Jurnal Perikanan Universitas Gadjah Mada. 21(2): 93 – 98.

Ishak, M., & S. Wahana. 2020. Efektifitas probiotik dan vitamin c terhadap pertumbuhan benih ikan nila (*Oreochromis niloticus*). Jurnal Agrokompleks. 9(1): 16 – 25.

Isnansetyo, A., H.M. Irpani, T.A. Wulansari, & N. Khasanah. 2014. Oral administration of alginate from a tropical brown seaweed, *Sargassum* sp. to enhance non-specific defense in walkin catfish (*Clarias* sp.) Aquacult Indo. 15- 73-80.

Jahan, N., S. M. M. Islam, M.F. Rohani, M. T. Hossain, M. Shahjahan. 2021. Probiotic yeast enhances growth performance of rohu (*Labeo Rohita*) through upgrading hematology, and intestinal microbiota and morphology. Aquaculture. 545 :1-8.

Jarmolowicz S., Z. Zakes, A. Siwicki, A. Kowalska, M. Hopko, E. Glabski, Z. Demska and K. Partyka. 2011. Effects of brewer's yeast extract on growth performance and healt of juvenil pikeperch (*Sander lucioperca*). Aquaculture Nutrition 18(4) : 457-464.

Jusuf, A.A. 2009. Histotech Dasar. Jakarta: Bagian Histologi Kedokteran Universitas Indonesia.

Junqueira, L. C., J. Carneiro, & R. O. Kelley. 1995. Basic Histology (Histologi Dasar, alih bahasa: Jan Tambayong). Edisi ke-8. Penerbit Buku Kedokteran EGC, Jakarta.

Jung, H.W., G.K. Panigrahi, G.Y. Jung, Y.J. Lee, K.H. Shin, A. Sahoo. E.S. Choi, E. Lee, K.M. Kim, S.H. Yang, J. Jeon, S.C. Lee, and S.H. Kim. 2020. Pathogenassociated molecular pattern-triggered immunity involves proteolytic degradation of core nonsense-mediated mRNA decay factors during the early defense response. Plant Cell. 32(4): 1081-1101.

KKP. 2021. Produksi Perikanan. <https://statistik.kkp.go.id/home.php?m=total&i=2>. Diakses tanggal 23 Desember 2023.

Kartika, B. 1992. Petunjuk Evaluasi Produk Industri Hasil Pertanian. Proyek Pengembangan Pusat Fasilitas Bersama Antar Universitas - PAU Pangan dan Gizi UGM, Yogyakarta.

Kavitha, M., M. Raja, & P. Perumal. 2018. Evaluation of probiotic potential of *Bacillus* spp. Isolate from the digestive tract fresh water fish *Labeo calbasu* (Hamilton, 1822). Aquaquulture Reports. 11: 56-69.

Khoirunnisa, L. 2024. Pengaruh Pemberian Probiotik *Bacillus* spp., *Lactococcus raffinolactis* dan *Saccharomyces cerevisiae* Pada Pakan Terhadap Pertahanan Tubuh Non-Spesifik Humoral Ikan Lele (*Clarias* sp.) Pada Skala Lapang. Fakultas Pertanian. Universitas Gadjah Mada. Skripsi.

Kuebutornye, F. K. A., E. D. Abarike, M. E. Sakyi, Y. Lu, & Z. Wang. 2020. Modulation of nutrient utilization, growth, and immunity of Nile tilapia,

- Kurniasih. 2008. Histopatologi Ikan. Apresiasi Balai Uji Standar Karantina Ikan. Pusat Karantina Ikan. Jakarta.
- Kumar, S., A. Verma, S.P. Singh, & A. Awasthi. 2023. Immunostimulants for shrimp aquaculture: paving pathway towards shrimp sustainability. Environmental Science and Pollution Research. 30: 25325–25343.
- Lakshmi, B., B. Viswanath, & D. V. R. S. Gopal. 2013. Probiotics as antiviral agents in shrimp aquaculture. Journal of Pathogen.
- Lazado, C.C., C.M.A. Caipang, M.F. Brinchmann, & V. Kiron. 2011. In vitro adherence of two candidate probiotics from atlantic cod and thei interference with the adhesion of two pathogenic bacteria. Vet. Microbiology. 148: 252-259.
- Leung, T.I.F & A.E. Bates. 2013. More rapid and severe disease outbreaks for aquaqlture at the tropics: Implications for food security. Journal of Apllied Ecology. 50(1) : 215-222.
- Li, P & D. M. Gatlin III. 2006. Nucleotide nutrition in fish: current knowledge and fiture application. Aquaculture. 251 : 141 – 152.
- Mahreni dan S. Suhenry. 2011. Kinetika pertumbuhan sel *sacharomyces cerevisiae* dalam media tepung kulit pisang. Seminar Rekayasa Kimia dan Proses. Fakultas Teknik. Universitas Diponegoro, Semarang.
- Manoppo, H dan M. E. F. Kolopita. 2015. Pengimbuhan ragi roti dalam pakan meningkatkan respons imun nonspesifik dan pertumbuhan ikan nila. Jurnal Veteriner 16(2): 204-211.
- Manisha. R., Deshmukh, Sudhir, G. Chirde, and Y.A. Gadhikar. 2015. Histological and histochemical study on the stomach and intestine of catfish *heteropneustes fossilis* (bloch 1794). Global Journal of Biology, Agriculture, Health Science. 4(1):1- 8.
- Manik, R. R. D. S., E. Handoco, L.O. Tambunan, J. Tambunan, & S. Sitompul. 2022. Socialization of catfish (*clarias sp.*) using semi-artificial spawning in aras village, batu bara regency. Jurnal Pengabdian Masyarakat. 3(1) :47-51.
- Mahyyudin, K. 2008. Panduan Lengkap Agribisnis Lele. Penebar Swadaya, Depok.
- Marcella, L.S., F.P. Arantes, T.C. Pessali, and J.E. Santos. 2015. Morphological, histological and histochemical analysis of the digestive tract of *Trachelyopterus striatulus* (Siluriformes: Auchenipteridae). Zoologia. 32(4): 296-305.
- Marlida R., M. Supriyadi, A. Winadarmi, & E. Harris. 2014. Isolation, selection and application of probiotic bacteria for improvement the growth performance of humpback groupers (*Cromileepes altivelis*). International Journal of Science : Basic and Applied Research. 16(1) : 364-379.
- Merrifield, D.L., A. Dimitroglou , A. Foey, S. J. Davies, Baker RTM, Bøgwald J, Castex M, dan Ringø E. 2010. The current status and future focus of probiotic

- Merrifield, D. L., J. L. Balcázar, C. Daniels, Z. Zhou, O. Carnevali, Y. Z. Sun, S. H. Hoseinifar, & E. Ringø. 2014. Indigenous lactic acid bacteria in fish and crustaceans. In *Aquaculture Nutrition*. John Wiley & Sons, America.
- Moawad, U. K., A. S. Awaad, & M. G. Tawfik. 2017. Histomorphological, histochemical, and ultrastructural studies on the stomach of the adult african Catfish (*Clarias gariepinus*). *Kournal of Microscopy and Ultrastructure*. 155-166.
- Mouki, Q., H. Yang, Y. Lin, & P. F. Huang. 2019. Amino acids influencing intestinal development and health of the piglets. *Animal (Basel)*. 9(6) : 1-11.
- Mohapatra, S., T. Chakraborty, A.K. Prusty, P. Das, K. Paniprasad, & K.N. Mohanta. 2012. Use of different microbial probiotics in the diet of rohu, *Labeo rohita* fingerlings; effect on growth; nutrient digestibility and retention; digestive enzyme activities and intestinal microflora. *Aquaculture Nutrition*. 18: 1-11.
- Oktaviani, D. P., S. Fadlilah, U. J. Muwakhidah, E. Damaiyanti, Fatimatu Zahroh, dan S. N. Agustin. 2021. Evaluasi penambahan probiotik bakteri asam laktat pada pakan terhadap pertumbuhan ikan gurame (*Osphronemus gouramy*). *Manfish Journal*. 2(1) : 44-49.
- Pambudi, I.F. 2021. Pengaruh Immunostimulan Gama Algin F terhadap Sintasan dan Pertumbuhan Ikan Nila Merah (*Oreochromis* sp.) yang dipelihara Pada Sistem Bioflok Resirkulasi. Fakultas Pertanian. Universitas Gadjah Mada. Skripsi.
- Panteli, N., M. Mastoraki, M. Lazarin, S. Chatzifotis, E. Mente, K.A. Kormas, & E. Antonopoulou. 2021. Configuration Of Gut Microbiota Structure And Potential Functionality In Two Teleosts Under The Influence of Dietary Insect Meals. *Microorganisms*. 9(4): 1-20.
- Petrinec, Z., S. Nejedli, S. Kuzir, & A. Opacak. 2005. Mucosubstances of the digestive tract mucosa in northern pike (*Esox lucius* L.) and european catfish (*Silurus glanis* L.). *Veterinarski Arhiv*. 75(4): 317-327.
- Puspitasari, R.A. 2023. Uji Lapang Pengaruh Pemberian Probiotik *Bacillus* spp., *Lactococcus raffinolactis* dan *Saccharomyces cerevisiae* Terhadap Sintasan , Pertumbuhan, Total Biomassa dan Efisiensi Pakan Lele (*Clarias* sp.). Fakultas Pertanian. Universitas Gadjah Mada. Skripsi.
- Putriyani, H. H. 2024. Pengaruh Pemberian Kombinasi Probiotik dan Immunostimulan dalam Pakan Terhadap Kualitas Air Budidaya Ikan Lele (*Clarias* sp.). Fakultas Pertanian. Universitas Gadjah Mada. Skripsi.
- Pratiwi, H.C., and A. Manan. 2015. The Basic Histology Technique Of Gouramy Fish. *Jurnal Ilmiah Perikanan dan Kelautan*. 7(2): 153-158.
- Petrinec Z, S. Nejedli, S. Kuzir, and A. Opacak. 2005. Mucosubstances of the digestive tract mucosa in northern pike (*Esox lucius* L.) and European catfish (*Silurus glanis* L.). *Veterinarski Arhiv*. 75: 317-27.
- Ramos, M. A., S. Batista, M. A. Pires, A. P. Silva, L. F. Pereira, M. J. Saavedra, R.O.A. Ozório, & P. Rema. 2017. Dietary probiotic supplementation improves growth

- Razak, A. P., R.L. Kreckhoff and J.C. Watung. 2017. Administrasi oral imunostimulan ragi roti (*Saccharomyces cerevisiae*) untuk meningkatkan pertumbuhan ikan mas (*Cyprinus Carpio L.*). *Budidaya Perairan*. 5(2): 27-36.
- Rahmiati., Amrullah, dan Suryati. 2018. Efektivitas multivitamin vitaliquid dan aminoliquid pada pembesaran ikan nila (*Oreochromis niloticus*). *Seminar Nasional Sinergitas Multidisiplin Ilmu Pengetahuan dan Teknologi*. 1: 247-251.
- Ringo, E., R. E. Olsen, T. T. O. Gifstad, R. A. Dalmo, H. Amlund, G. L. Hemre, and A.M. Bakke. 2010. Prebiotics in aquaculture: a review. *Aquaculture Nutrition*. 16: 117-136.
- Ringo, E., S. H. Hoseinifar, K. Ghosh, H. V. Doan, B. R. Beck, and S. K. Song. 2018. Lactic acid bacteria in finfish-an update. *Frontiers in Microbiology*. 9(01818): 1-37.
- Rostini, I. 2007. Peranan Bakteri Asam Laktat (*Lactobacillus plantarum*) Terhadap Masa Simpan Ikan Nila Merah Pada Suhu Rendah. *Fakultas Perikanan dan Ilmu Kelautan*. Unpad.Bogor.
- Robert, R.J. 2012. *Fish Pathology*. Blackwell publishing. United Kingdom.
- Rustadi. 2018. *Manajemen Akuakultur Tawar*. Gadjah Mada University Press, Yogyakarta.
- Sahara, R. 2017. Efisiensi Pemanfaatan Pakan dan Pertumbuhan Benih Ikan Lele (*Clarias* sp.) Dengan Penambahan Tepung Alga Coklat (*Sargassum* sp.) Dalam Pakan. *Jurnal Sains Teknologi Akuakultur*. 1(1) : 38-46.
- Saputri, W., dan A. Razak. 2018. The effect of giving fermentations flows of pinang leaf (*Areca catechu L.*) and surian leaves (*Toona sinensis ROXB*) to lele fish paint (*Clarias gariepinus*). *Bio Sains*. 1(1): 31-40.
- ShaoWei, Z., S. QingChao, & C. XueHao. 2016. Effect of dietary antimicrobial peptidessurfactin supplementation on parameters of intestinal health indices of genetically improved farmed tilapia (*Oreochromis niloticus*). *Acta Hydrobiologica Sinica*. 40(4): 823–829.
- Siagian, Y. A. 2016. Gambaran Histologis dan Tinggi Vili Usus Halus Bagian Ileum Ayam Ras Pedaging Yang Diberi Tepung Daun Kelor (*Moringa oleifera*) Dalam Ransum. *Program Studi Peternakan*. Fakultas Peternakan.
- Siddiq, N.R. 2022. Pengaruh Pemberian Probiotik IW secara Oral terhadap Sintasan dan Pertumbuhan Lele Dumbo (*Clarias* sp.) dengan Pakan Komersial Berprotein Rendah. *Fakultas Pertanian*. Universitas Gadjah Mada. Skripsi.
- Secombes, C.J & A. E. Ellis. 2012. *The Immunology of Teleosts*. In: Roberts, R.J. (Ed.), *Fish Pathology*. Wiley-Blackwell, Oxford, UK, pp. 144–166.
- Septiarini., E. Harpeni, dan Wijayanto. 2012. Pengaruh pemberian probiotik yang berbeda terhadap respon imun non-spesifik ikan mas (*Cyprinus carpio*) tabf diuji tantang dengan bakteri *Aeromonas salmonicida*. *Jurnal Rekayasa dan*

- Setiawati, J.E., Tarsim., Y.T. Adiputra, & S. Hudaidah. 2013. Pengaruh penambahan probiotik pada pakan dengan dosis berbeda terhadap pertumbuhan, kelulushidupan, efisiensi pakan dan retensi protein ikan patin (*Pangasius hypophthalmus*). E-Jurnal Rekayasa dan Teknologi Budidaya Perairan. 1(2) : 151-162.
- Sihotang, D. M. 2018. Penentuan kualitas air untuk perkembangan ikan lele sangkuriang menggunakan metode fuzzy SAW. Jurnal Nasional Teknik 7(4) : 372-376.
- Silva, C. C. G., S.P.M. Silva, and S.C. Riberio. 2018. Application of bacteriocins and protective cultures in dairy food preservation. Microbiology. 7(4): 372-376.
- Subagiyo, R. A. T. Nuraeni, W. A. Setyati, & A. Santoso. 2016. optimasi suhu dan ph pertumbuhan *Lactococcus Lactic* isolat ikan kerapu. Jurnal Kelautan Tropis. 19(2) : 166-170.
- Sukenda, Rahman, dan D. Hidayatullah. 2016. Kinerja probiotik *Bacillus spp.* pada pendederan benih ikan lele *Clarias sp.* yang diinfeksi *Aeromonas hydrophilla*. Jurnal Akuakultur Indonesia. 15(2) : 162-170.
- Sundberg, L.R., T. Ketola, E. Laanto, H. Kinnula, J.K.J. Bamford, R. Penttinen & J. Mappes. 2016. Intensive aquaculture selects for increased virulence and interference competition in bacteria. Proceeding The Royal Society. 283: 1-10.
- Sun, Y.Z., H.L. Yang, R.L. Ma, & W.Y. Lin. 2010. Probiotic applications of two dominant gut *Bacillus* strains with antagonistics activity improved the growth performance and immune responses of grouper *Epinephelus coiodes*. Fish & Shellfish Immunology. 29: 803-809.
- Supriyatna, A., D. Amalia, A.A. Jauhari, dan D. Holydazlah. 2015. Aktivitas enzim amylase, lipase dan protease dari larva *Hermetia illucens* diberi pakan jerami padi. Jurnal Kajian Islam, Sains dan Teknologi. 9(2) 1979-8911.
- SNI 6484. 4. 2014. Ikan Lele Dumbo (*Clarias sp.*) Bagian 4: Produksi Benih. Badan Standarisasi Nasional.
- Suyanto, S. R. 2007. Budidaya Ikan Lele Edisi Revisi. Penebar Swadaya, Depok.
- Sherwood, L. L. 2011. Fisiologi Manusia. Edisi 2. Jakarta: EGC.
- Slenbrouck, J., O. Qomaruddin, Maskur, dan M. Legendre. 2005. Manajemen Kesehatan Ikan. Petunjuk Teknis Pembenihan Ikan Patin di Indonesia, *Pangasius Djambal*.
- Ta'dung, R., R.A. Tumbol, J. D. Mudeng, H.J. Sinjal, dan C. Lumenta. 2023. Utilization of miana leaf extract (*Coleus atropurpureus*) to increase immune response of nile tilapia seed (*Oreochromis niloticus*). E-journal Budidaya Perairan. 11(2) : 90-97.
- Utami, D.A.S., Winadarni & M.A. Suprayudi. 2015. Quality of dried *Bacillus* NP5 and its effect on growth performance of tilapia (*Oreochromis niloticus*). Pakistan Journal of Biological Sciences. 18(2) : 88-93.

- Wang, M., F. Wu, S. Xie, & L. Zhang. 2021. Acute hypoxia and reoxygenation: Effect on oxidative stress and hypoxia signal transduction in the juvenile yellow catfish (*Pelteobagrus fulvidraco*). *Aquaculture*. 531: 735903.
- Wardika, A. S., Suminto, dan A. Sudaryono. 2014. Pengaruh bakteri probiotik pada pakan dengan dosis berbeda terhadap efisiensi pemanfaatan pakan, pertumbuhan, dan kelulushidupan lele (*Clarias gariepinus*). *Journal of Aquaculture Management and Technology*. 3(4): 9-17.
- Widanarni, T. Nopitawati, and D. Jusadi. 2015. Screening of probiotic bacteria candidates from gastrointestinal tract of pacific white shrimp *Litopenaeus vannamei* and their effect on the growth performances. *Research Journal of Microbiology*. 10 (4) : 145-157.
- Vine N.G., W.D. Leukes, and H. Kaiser. 2006. Probiotics in marine larviculture. *FEMS Microbiology Reviews*. 30(3):404–427.
- Vijayaram, S., E. Ringø, A. Zuorro, H. V. Doan, Y. Sun. 2023. Beneficial roles of nutrients as immunostimulants in aquaculture: A review. *Aquaculture and Fisheries*. 10(4) : 950-974.
- Yamauchi, K & Y. Isshiki. 1991. Scanning electron microscopic observations on the intestinal villi in growing White Leghorn and broiler chickens from 1 to 30 days of age. *British Poultry Science*. 32: 67-78.
- Yanbo, W & X. Zirong. 2006. Effect of probiotics for common carp (*Cyprinus carpio*) based on growth performance and digestive enzyme activities. *Animal Feed Science and Technology*. 127: 283-292
- Yang, S & M. Yu. 2021. Role of goblet cells in intestinal barrier and mucosal immunity. *Journal Inflamm Research*. 14: 3171-3183.
- Zhang, M & C. Wu. 2020. The relationship between intestinal goblet cells and the immune response. *Bioscience Report*. 40 : 1-11.
- Zonneveld, N., Hullsman, & A. Boon. 1991. *Budidaya Ikan*. Gramedia : Jakarta.