DAFTAR PUSTAKA

Abdulrahman, N.M., Abid, S.H. and Koyun, M., 2019. Effect of Microalgae *Chlorella pyrenoidosa* as Feed Additive on Common Carp (*Cyprinus carpio* L.) Nutritional Performance, Proximate Composition and Organoleptic Evaluation. *Biological and Applied Environmental Research*, 3(2), pp.118-126.

Ahmad, M.T., Shariff, M., Yusoff, F.M., Goh, Y.M. and Banerjee, S., 2018. Appllications of Microalga *Chlorella vulgaris* in Aquaculture. *Reviews in Aquaculture*, 12(1), pp.1-19.

Akbary, P. dan Malek, R.E., 2020. Effect of Dietary Supplementation of *Chlorella vulgaris* on Several Physiological Parameters of Grey Mullet, *Mugil cephalus*. *Iranian Journal of Fisheries Sciences*, 19(3), pp.1130-1139.

Akter, T., Hossain, A., Islam, M.R., Hossain, M.A., Das, M., Rahman, M.M., Aye, A.A. and Tawwab, M.A., 2021. Effects of Spirulina (*Arthospira platensis*) as A Fishmeal Replacer in Practical Diets on Growth Performance, Proximate Composition, and Amino Acids Profile of Pabda Catfish (*Ompok pabda*). *Journal of Applied Aquaculture*, 35(1), pp.1-14.

Alagawany, M., Taha, A.E., Noreldin, A., El-Tarabily, K.A. and El-Hack, M.E.A., 2021. Nutritional Applications of Species of *Spirulina* and *Chlorella* in Farmed Fish: A Review. *Aquaculture*, 542, pp.1-11.

Almuhlim, N.M., Virk, P., Abdelwarith, A.A. and Alkhulaifi, F.M., 2023. Effect of Incorporation of *Spirulina platensis* into Fish Diets, on Growth Performance and Biochemical Composition of Nile Tilapia, *Oreochromis niloticus*. *The Egyptian Journal of Aquatic Research*, 49(3), pp.537-541.

Ansari, F.A., Guldhe, A., Gupta, S.K., Rawat, I. and Bux, F., 2021. Improving the Feasibility of Aquaculture Feed by Using Microalgae. *Environmental Science and Pollution Research*, 28, pp.234-257.

AOAC, 1974. *Selected Organic Syntheses. A Guidebook for Organic Chemists*. New Jersey: John Wiley & Sons Inc.

Areekijseree, M., Engkagul, A., Kovitvadhi, S. and Kovitvadhi, U., 2006. Development of Digestive Enymes and in Vitro Digestibility of Different Species of Phytoplankton for Culture of Early Juveniles of the Freshwater Pearl Mussel, *Hyriopsis* (Hyriopsis) *bialatu*s Simpson, 1900. *Invertebrate Reproduction and Development*, 49(4), pp.255-262.

Badan Pusat Statistik, 2022. *Produksi Ikan di Kabupaten Banyumas (Ekor), 2014-2016.* [Online] https://banyumaskab.bps.go.id.

Bano, S., Khan, N., Arslan, M., Fatima, M., Khalique, A. and Wan, A.H.L., 2023. Impact of Various Dietary Protein Levels on the Growth Performance, Nutrient Profile, and Digestive Enzymes Activities to Provide an Effective Diet for Striped Catfish (*Pangasius hypophthalmus*). *Turkish Journal of Fisheries and Aquatic Sciences*, 23(7), pp.1-12.

Biabani, A.M., Sudagar, M., Yousefi, S.S. and Mazandarani, M., 2020. The Effect of Spirulina on Reproductive Parameters, Body Composition, Immune Indices and Digestive Enzyme in Dwarf Gourami (*Trichogaster lalius*). *Iranian Journal of Fisheries Sciences*, 19(3), pp.1280-1291.

Bouchaala, E., Ali, Y.B., Miled, N., Gargouri, Y. and Fendri, A., 2015. Biochemical Characterization and Molecular Modeling of Pancreatic Lipase from A Cartilaginous Fish, the Common Stingray (*Dasyatis pastinaca*). *Applied Biochemistry and Biotechnology*, 176(1), pp.151-169.

Carnerio, W.F., Castro, T.F.D., Orlando, T.M., Meurer, F., Paula, D.A.J., Virote, B.C.R., Vianna, A.R.C.B. dan Murgas, D.S., 2020. Replacing Fish Meal by *Chlorella* sp. Meal: Effects on Zebrafish Growth, Reproductive Performance, Biochemical Parameters and Digestive Enzymes. *Aquaculture*, 528, pp.1-27.

Christwardana, M., Nur, M.M.A. dan Hadiyanto, 2013. *Spirulina platensis*: Potensinya sebagai Bahan Pangan Fungsional. *Jurnal Aplikasi Teknologi Pangan*, 2(1), pp.1-4.

De Gelder, S., Saele, O., Veen, B.T.H., Vos, J., Flik, G., Berntseen, M.H.G. and Klaren, P.H.M., 2017. The Polycyclic Aromatic Hydrocarbons Benzo[α]pyrene and Phenanthrene Inhibit Intestinal Lipase Activity in Rainbow Trout (*Oncorhynchus mykiss*). *Comparative Biochemistry and Physiology, Toxicology & Pharmacology*, 198, pp.1-8.

Dias, D., Dardengo, G.M., Engrola, S. and Guillen, N.C., 2021. Characterization and Comparison of the Digestive Physiology of Two Scombrids, *Katsuwanus pelamis* and *Sarda sarda*, in the Gulf of Cadiz. *Plos One*, 16(4), pp.1-20.

Eissa, E.H., Aljarari, R.M., Elfeky, A., El-Aziz, Y.M.A., Munir, M.B., Jastaniah, S.D., Alaidaroos, B.A., Shafi, M.E., El-Hamed, N.N.B.A., Al-Farga, A., Dighiesh, H.S., Okon, E.M., El-Hack, M.E.A., Ezzo, O.H., Eissa, M.E.H. and El-Banna, N.I., 2023. Protective Effects of *Chlorella vulgaris* as A Feed Additive on Growth Performance, Immunity, Histopatology, and Disease Resistance Against *Vibrio parahaemolyticus* in the Pacific White Shrimp. *Journal of European Aquaculture Society*, 31(5), pp.1-20.

Faccioli, C.K., Chedid, R.A., Mori, R.H., do Amaral, A.C., Vicentini, I.B.F. and Vicentini, C.A., 2016. Acid and Alkaline Phosphatase Localization in the Digestive Tract Mucosa of the *Hemisorubim platyrhynchos*. *Acta Histochemica*, 118(7), pp.722-728.

Faheem, M., Jamal, R., Nazeer, N., Khaliq, S., Hossein, S.H., Doan, H.V. and Paolucci, M., 2022. Improving Growth, Digestive and Antioxidant Enzymes

and Immune Response of Juvenile Grass Carp (*Ctenopharyngodon idella*) by Using Dietary *Spirulina platensis*. *Fishes*, 7(5), pp.237-248.

Galal, A.A.A., Reda, R.M. and Mohamed, A.A.R., 2018. Influences of *Chlorella vulgaris* Dietary Supplementation on Growth Performance, Hematology, Immune Response and Disease Resistance in *Oreochromis niloticus* Exposed to Sub-Lethal Concentrations of Penoxsulam Herbicide. *Fish & Shellfish Immunology,* 77, pp.445-456.

Gioda, C.R., Pretto, A., Freitas, C.S., Leitemperger, J., Loro, V.L., Lazzari, R., Lissner, L.A., Baldisserotto, B. and Salbego, J., 2017. Different Feeding Habits Influence the Activity of Digestive Enzymes in Freshwater Fish. *Cienca Rural*, 47(3), pp.1-7.

Gisbert, E., Nolasco, H. and Solovyev, M., 2018. Towards the Standarization of Brush Border Purification and Intestinal Alkaline Phosphatase Quantification in Fish with Notes on Other Digestive Enzymes. *Aquaculture*, 487, pp.102-108.

Jiao, F., Zhang, L., Limbu, S.M., Yin, H., Xie, Y., Yang, Z., Shang, Z., Kong, L. and Rong, H., 2023. A Comparison of Digestive Strategies for Fishes with Different Feeding Habits: Digestive Enzyme Activities, Intestinal Morphology, and Gut Microbiota. *Ecology and Evolution*, 13(9), pp.1-14.

Khani, M., Soltani, M., Mehrjan, M.S., Foroudi, F. and Ghaeni, M., 2017. The Effect of *Chlorella vulgaris* Supplementation on Growth Performance, Blood Characteristics, and Digestive Enzymes in Koi (*Cyprinus carpio*). *Iranian Journal of Fisheries Sciences*, 16(2), pp.832-843.

Lalles, J.P., 2019. Intestinal Alkaline Phosphatase in the Gastrointestinal Tract of Fish: Biology, Ontogeny, and Environmental and Nutritional Modulation. *Reviews in Aquaculture*, 12(2), pp.555-581.

Lin, H., Chen, X., Yang, Y., Wang, J., Huang, X., Huang, Z., Zhou, C., Wang, Y., Yu, W. and Qi, C., 2016. Effect of Different Levels of *Spirulina platensis* Dietary Supplementation on the Growth, Body Color, Digestion, and Immunity of *Trachinotus ovatus*. *The Israeli Journal of Aquaculture*, 68, pp. 1-9.

Llorens, S.M., Peruzzi, S., Petersen, I.B.F., Olmos, S.G., Ulleberg, L.O., Vidal, A.T., Puvanendran, V., Odei, D.K., Hagen, O., Fernandes, J.M.O. and Jobling, M., 2021. Digestive Tract Morphology and Enzyme Axtivities of Juvinile Diploid and Triploid Atlantic Salmon (*Salmo salar*) Fed Fishmeal Based Diets with or without Fish Protein Hydrolysates. *PLoS ONE*, 16(1), pp.216-245.

Markweg, H., Lang, M.S. and Wagner, F., 1995. Dodecanoic Acid Inhibition of Lipase form *Acinetobacter sp.*. *Enzyme Microbial Technology*, 17, pp.512-516.

Mohammadiazarm, H., Maniat, M., Ghorbanijezeh, K. and Ghotbeddin, N., 2020. Effect of Spirulina Powder (*Spirulina platensis*) as A Dietary Additive on Oscar Fish, *Astronotus ocellatus*: Assesing Growth Performance, Body Composition, Digestive Enzyme Activity, Immune-Biochemical Parameters, Blood Indices and Total Pigmentation. *Aquaculture Nutrition*, 27, pp.252-260.

Pakravan, S., Akbarzadeh, A., Sajjadi, M.M., Hajimoradloo, A. and Noori, F., 2017. *Chlorella vulgaris* Meal Improved Growth Performance, Digestive Enzyme Activities, Fatty Acid Composition and Tolerance of Hypoxia and Ammonia Stress in Juvenile Pacific White Shrimp *Litopenaeus vannamei*. *Aquaculture Nutrition*, 24(1), pp.594-604.

Peng, K., Chen, X., Wei, D., Zhao, L., Chen, B., Mo, W., Zheng, C. and Sun,Y., 2020. Inclusion of *Chlorella* Water Extract in *Oreochromis niloticus* Fingerlng Diets: Effects on Growth Performance, Body Composition, Digestive Enzyme Activity, Antioxidant and Immune Capacity, Intestine and Hepatic Histomorphology and Sodium Nitrite Stress Resistance. *Aquaculture Reports*, 18, pp.1-9.

Pratiwi, N.T.M., Winarlin, Frandy, Y.H.E. dan Iswantari, A., 2011. Potensi Plankton sebagai Pakan Alami Larva Ikan Nilem (*Osteochilus hasselti* C.V.). *Jurnal Akuakultur Indonesia*, 10(1), pp.81-88.

Pujante, I.M., Lopez, M.D., Mancera, J.M. and Moyano, F.J., 2016. Characterization of Digestive Enzymes Protease and Alpha-Amylase Activities in the Thick-Lipped Grey Mullet (*Chelon labrosus*, Risso 1827). *Aquaculture Research*, 48(2), pp.1-10.

Radhakrishnan, S., Bhavan, S.B., Seenivasan, C., Shanthi, R. and Muralisankar, T., 2014. Replacement of Fishmeal with *Spirulina platensis*, *Chlorella vulgaris* and *Azolla pinnata* on non-Enzymeatic and Enzymatic Antioxidant Activities of *Macrobrachium rosenbergii*. *Journal of Basic & Applied Zoology*, 67(2), pp.25-33.

Raji, A.A., Alaba, P.A., Yusuf, I., Bakar, N.H.A., Taufek, N.H.M., Muin, H., Alias, Z., Milow, P. and Razak, S.A., 2018. Fishmeal Replacement with *Spirulina platensis* and *Chlorella vulgaris* in African Catfish (*Clarias gariepinus*) Diet: Effect on Antioxidant Enzyme Activities and Haematological Parameters. *Research in Veterinary Science*, 119, pp.67-75.

Raji, A.A., Quazim, J.O., Milow, P., Taufek, N.M., Fada, A.M., Adekilekun, K.A., Alias, Z. and Razak, S.A., 2019. Partial Replacement of Fishmeal with *Spirulina platensis* and *Chlorella vulgaris* and its Effect on Growth and Body Composition of African Catfish *Clarias gariepinus* (Burchell 1822). *Indian Journal of Fisheries*, 66(4), pp.100-111.

Raji, A.A., Jimoh, W.A., Bakar, N.H.A., Taufek, N.H.M., Muin, H., Alias, Z., Milow, P. and Razak, S.A., 2020. Dietary Use of *Spirulina* (*Arthrospira*) and

Chlorella Instead of Fish Meal on Growth and Digestibility of Nutrients, Amino Acids and Fatty Acids by African Catfish. *Journal of Applied Phycology*, 32, pp.1763-1770.

Rick, W., 1974. *Trypsin, In Bergmeyer, H.U., ed. Methods of Enzymatic Analysis Volume 2*. New York and London: Academic Press and Verlag Chemie Weinheim.

Roohani, A.M., Kenari, A.A., Kapoorchali, M.F., Borani, M.S., Zorriehzahra, M.J., Smiley, A.H., Esmaeili, M. and Rombenso, A.N., 2019. Effect of *Spirulina platensis* as A Complementary Ingridient to Reduce Dietary Fish Meal on the Growth Performance, Whole-Body Composition, Fatty Acid and Amino Acid Profiles, and Pigmentation of Caspian Brown Trout (*Salmo trutta caspius*) Juveniles. *Aquaculture Nutrition*, 25(3), pp.633-645.

Sa'adah, F., Lisminingsih, R.D. dan Latuconsina, H., 2023. Perbandingan Probiotik dengan Konsentrasi Berbeda terhadap Pertumbuhan dan Sintasan Ikan Nilem (*Osteochilus vittatus*). *Jurnal Akuakultur, Pesisir dan Pulau-Pulau Kecil*, 7(1), pp.23-28.

Safi, C., Zebib, B., Merah, O., Pontalier, P. and Garcia, C.V., 2014. Morphology, Composition, Production, Processing and Applications of *Chlorella vulgaris*. *Renewable and Sustainable Energy Reviews*, 35, pp.265-278

Santos, W.M., Costa, L.S., Olmeda, J.F.L., Costa, N.C.S., Santos, F.A.C., Oliveira, C.G., Guilherme, H.O., Bahiense, R.N., Luz, R.K. and Ribeiro, P.A.P., 2020. Dietary Protein Modulates Digestive Enzyme Activities and Gene Expression in Red Tilapia Juveniles. *Animal*, 14(9), pp.1802-1810.

Simanjuntak, S.B.I., Indarmawan, and Wibowo, E.S., 2018. Impact of Fed Containing Different Levels of Diets Supplementation *Spirulina platensis* on Growth, Haematological, Body Composition and Biochemical Parameters, of Gurami (*Osphronemus gouramy*). *Turkish Journal of Fisheries and Aquatic Sciences*, 18(5), pp.681-690.

Simanjuntak, S.B.I., Hana, Yunida, R. and Zuwanda, M.H., 2022. Lipase Activity, Hematological and Blood Biochemistry of *Osphronemus gouramy* Fed with Suplementation of *Spirulina platensis* and *Chlorella vulgaris*. *Molekul*, 17(1), pp.85-97.

Solovyev, M.M., Kashinskaya, E.N., Izvekova, G.I. and Glupov, V.V., 2015. pH Values and Activity of Digestive Enzymes in the Gastrointestinal Tract of Fish in Lake Chany (West Siberia). *Journal of Ichthyology*, 55(2), pp.251-258.

Sundarram, A. and Murthy, T.P.K., 2014. α-Amylase Production and Applications: A Review. *Journal of Applied & Environmental Microbiology*, 2(4), pp.166-175.

Susilo, U., Setyaningrum, N. dan Rachmawati, F.N., 2013. Aktivitas Protease dan Komposisi Proksimat Tubuh Ikan Sidat (*Anguilla bicolor* McClelland) pada Kondisi Puasa dan Pemberian Pakan Kembali. *Biosfera*, 30(2), pp.96-103.

Viegas, C., Gouveia, L. and Goncalves, 2021. Aquaculture Wastewater Treatment Through Microalgal Biomass Potential Applications on Animal Feed, Agricultural, and Energy. *Journal of Environmental Management*, Volume 286, pp.1-14.

Volkoff, H. and Ronnestad, I., 2020. Effects of Temperature on Feeding and Digestive Processes in Fish. *Temperature*, 7(4), pp.307-320.

Walter, K. and Schutt, K., 1974. *Acid and Alkaline Phosphatase in Serum (Two Point Method*). *In: Bergmeyer, H.U.* (ed.) *Methods of Enzymatic Analysis Volume 2*. Weinheim: Verlag Chemie & Academic Press.

Whitmore, D.H. and Goldberg, E., 1972. Trout Intestinal Alkaline Phosphatases II. The Effect of Temperature upon Enzymatic Activity *in Vitro* and *in Vivo*. *Journal of Experimental Zoology*, 182(1), pp.59-68.

Xi, L., Lu, Q., Liu, Y., Su, J., Chen, W., Gong, Y., Han, D., Yang, Y., Zhang, Z., Jin, J., Liu, H., Zhu, X. and Xie, S., 2022. Effects of Fish Meal Replacement with *Chlorella* Meal on Growth Performance, Pigmentation, and Liver Health of Largemouth Bass (*Micropterus salmoides*). *Animal Nutrition*, 10(3), pp.26-40.

Xu, W., Gao, Z., Qi, Z., Qiu, M., Peng, J.Q. and Shao, R., 2014. Effect of Dietary Chlorella on the Growth Performance and Physiological Parameters of Gibel Carp, *Carassius auratus gibelio*. *Turkish Journal of Fisheries and Aquatic Sciences*, 14(1), pp.53-57.

Yunida, R., Sukardi, P. and Simanjuntak, S.B.I., 2019. Digestive Enzyme Activities of *Osteochilus vittatus* with *Spirulina platensis* Feed Supplementation in Biofloc System. *Biosaintifika: Journal of Biology & Biology Education*, 11(3), pp.369-376.

Zamani, A., Khajavi, M., Kenari, A.A., Nazarpak, M.H., Solouk, A.S., Esmaeili, M. and Gisbert, E., 2023. Physicochemical and Biochemical Properties of Trypsin-like Enzyme from Two Sturgeon Species. *Animals*, 13(5), pp.853-867.

Zhang, Y.X., Jiang, Z.Y., Han, S.L., Li, L., Qiao, F., Zhang, M.L. and Du, Z.Y., 2019. Inhibition of Intestinal Lipases Alleviates the Adverse Effects Caused by High-Fat Diet in Nile Tilapia. *Fish Physiology & Biochemistry*, 46(1), pp.111-123.