



DAFTAR PUSTAKA

- A.A. Adeoye, R. Yomla, A. Jaramillo-Torres, A. Rodiles, D.L. Merrifield and S.J. Davies. 2016. Combined effects of exogenous enzymes and probiotic on Nile tilapia (*Oreochromis niloticus*) growth, intestinal morphology and microbiome. Aquaculture, 463: 61-70.
- A.F. Diógenes, C. Castro, M. Carvalho, R. Magalhães, T.T. Estevão-Rodrigues, C.R. Serra, A. Oliva-Teles and H. Peres. 2018. Exogenous enzymes supplementation enhances diet digestibility and digestive function and affects intestinal microbiota of turbot (*Scophthalmus maximus*) juveniles fed distillers' dried grains solubles (DDGS) based diets. Aquaculture, 486: 42-50.
- Adeola, O. and A. Cowieson, 2011. Board-invited review: Opportunities and challenges in using exogenous enzymes to improve nonruminant animal production. Journal of Animal Science, 89: 3189–3218.
- Afrianto, E. dan Liviawaty. 2005. Pakan Ikan. Penerbit Kanisius, Yogyakarta.
- Aiyer, P.V. 2005. Amylases and their applications. African Journal of Biotechnology, 4: 125–135.
- Arafat, M.Y., N. Abdulgani, dan R. D. Devianto. 2015. Pengaruh penambahan enzim pada pakan terhadap pertumbuhan ikan nila (*Oreochromis niloticus*). Jurnal Sains dan Seni, 4(1): 21-25.
- Ardita, N., A. Budiharjo, dan S. L. A. Sari. 2015. Pertumbuhan dan rasio konversi pakan ikan nila (*Oreochromis niloticus*) dengan penambahan prebiotik. Bioteknologi, 12: 16-21.
- Bairagi A., K.S. Ghosh, S.K. Sen and A.K. Ray. 2004. Evaluation of the nutritive value of *Leucaena leucocephala* leaf meal, inoculated with fish intestinal bacteria *Bacillus subtilis* and *Bacillus circulans* in Formulated diets for Rohu, *Labeo rohita* (Hamilton) Fingerlings. Aquaculture Research, 35: 436-446.
- Beveridge, M.C.M. and D.J. Baird. 2000. Diet, Feeding and Digestive Physiology In: M.C.M. Beveridge and B.J. McAndrew (Eds.) Tilapias: Biology and Exploitation. Kluwer Academic Publishers, p: 59-87.
- Boyd, E.C. and C.S. Tucker. 1998. Pond Aquaculture Water Quality Management. Kluwer Academic Publishers, Massachusetts.
- Boyd, E.C. and F. Lichkoppler. 1979. Water Quality Management in Pond Fish Culture. Elsevier Scientific Publishing Company, Amsterdam.
- Brett, J.R. and T.D.D. Groves. 1979. Physiological Energetics In: W.S. Hoar, D.J. Randall and J.R. Brett (Eds.) Bioenergetics and Growth. Fish Physiology, p: 279-352.
- Castillo, S. and D.M. Gatlin III. 2015. Dietary supplementation of exogenous carbohydrase enzymes in fish nutrition: A review. Aquaculture 435: 286-292.



- Cheng, Z.J. and R.W. Hardy. 2004. Effect of microbial phytase supplementation in corn distiller's dried grain with soluble on nutrient digestibility and growth performance of rainbow trout, *Oncorhynchus mykiss*. Journal of Applied Aquaculture, 15: 87–100.
- Effendi, H. 2003. Telaah Kualitas Air Bagi Pengelolaan Sumberdaya dan Lingkungan Perairan. Penerbit Kanisius, Yogyakarta.
- Effendie, M.I. 1979. Metode Biologi Perikanan. Cetakan I. Yayasan Dewi Sri, Bogor.
- Ferdiansyah, V. 2005. Pemanfaatan Kitosan dari Cangkang Udang Sebagai Matriks Penyangga pada Imobilisasi Enzim Protease. Fakultas Perikanan dan Ilmu Kelautan. IPB, Bogor. Skripsi.
- Ghufran, M. dan K. Kordi. 2010. Budidaya Ikan Nila di Kolam Terpal. Lily Publisher, Yogyakarta.
- Haetami, K. 2012. Konsumsi dan efisiensi pakan dari ikan jambal siam yang diberi pakan dengan tingkat energi protein berbeda. Jurnal Akuatika, 3(2): 146–158.
- Hopkins, J.S., Sandifer and Browdy. 1994. Sludge management in intensive pond culture on shrimp: Effect of management regime on water quality, sludge characteristic, nitrogen extinction, and shrimp production. Aquaculture Engineering, 13: 11-30.
- Huet, M. 1971. Textbook of Fish Culture. Fishing News Book Ltd, London.
- Irianto, A. 2005. Patologi Ikan Teleostei. Gadjah Mada University Press, Yogyakarta.
- Iskandar, R. dan Elrifadah. 2015. Pertumbuhan dan efisiensi pakan ikan nila (*Oreochromis niloticus*) yang diberi pakan buatan berbasis kiambang. Ziraa'ah, 40(1): 18-24.
- Islam, M.A, M. Asaduzzaman, S. Biswas, M. Maniruzzaman, M. Rahman, M.A. Hossain, A.M.M. Uddin, M. Asaduzzaman, M.S. Rahman and S. Munira. 2015. Determination of protein, lipid and carbohydrate contents of conventional and non-conventional feed items used in carp polyculture pond. Journal of Aquaculture Resources Development, 6(2): 1-5.
- Isnaeni, W. 2006. Fisiologi Hewan. Penerbit Kanisius, Yogyakarta.
- Istiqomah, L. 2015. Aplikasi Enzim Fitase pada Pabrik Pakan Unggas. <http://bptba.lipi.go.id/bptba3.1/?u=blog-single&p=309&lang=id>. Diakses tanggal 22 November 2019.
- Khairuman dan K. Amri. 2009. Peluang Usaha dan Teknik Budidaya Lele Sangkuriang. PT. Gramedia Pustaka Utama, Jakarta.
- Kim W., S. Bae, K. Park, S. Lee, W. Choi, S. Han and Y. Koh. 2011. Biochemical characterization of digestive enzymes soldier fly, *Hermetia illucens* (Diptera: Stratiomyidae). Journal of Asia Pasific Entomology, 14(1): 11-14.



KKP. 2017. Nilai Ekspor Tilapia Capai US\$ 71,419 Juta. www.gatra.com. Diakses 15 September 2017.

Klahan, R., N. Areechon, R. Yoonpundh and A. Engkagul. 2009. Characterization and activity of digestive enzymes in different sizes of nile tilapia (*Oreochromis niloticus* L.). *Kasetsart Journal (Natural Science)*, 43 : 143-153.

Kordi, K. 2009. Budi Daya Perairan. PT. Citra Aditya Bakti, Bandung.

Lehninger, A. L., 1995. Principles of Biochemistry (Dasar-Dasar Biokimia, alih bahasa: Maggy Thenawijaya). Penerbit Erlangga, Jakarta.

Lupatsch, I. 2009. Quantifying Nutritional Requirements in Aquaculture: The Factorial Approach In: G. Burnell and G. Allan (Eds.) New Technologies in Aquaculture Improving Production Efficiency, Quality and Environment Management. Woodhead Publishing Series in Food Science, Technology and Nutrition, p: 417-439.

Maas, R.M., M.C.J. Verdegem, Y. Dersjant-Li and J.W. Schrama. 2018. The effect of phytase, xylanase and their combination on growth performance and nutrient utilization in Nile tilapia. *Aquaculture*, 487: 7-14.

Masduqi, A dan A. Slamet. 2009. Satuan Operasi untuk Pengolahan Air. Jurusan Teknik Lingkungan. Fakultas Teknik Sipil. Institut Teknologi Sepuluh November, Surabaya.

Megiandari, A. 2009. Isolasi dan Pencirian Enzim Protease Keratinolitik Dari Usus Biawak Air. Jurusan Kimia FMIPA. Institut Pertanian Bogor. Master Thesis.

National Research Council. 2011. Nutrient Requirements of Fish and Shrimp. The National Academic Press. Washington.

Pillay, T.V.R. 1992. Aquaculture and the Environment. Fishing News Book. England.

Poedjiadi, A. dan F. M. T. Supriyanti. 2009. Dasar-Dasar Biokimia. Penerbit Universitas Indonesia, Jakarta.

Prasetiami, A. 2010. Pengaruh Kepadatan Tebar Terhadap Pertumbuhan dan Sintasan Benih Ikan Bawal Air Tawar (*Colossoma Macropomum*) dalam Sistem Resirkulasi. Universitas Lampung. Skripsi.

Prihartono, R.E. 2004. Permasalahan Gurami dan Solusinya. Penebar Swadaya, Jakarta.

Rachmawati, D. 2012. Rekayasa teknologi peningkatan produksi biomas kerapu macan (*Ephinephelus fuscoguttatus*) melalui penambahan enzim fitase dalam pakan buatan. *Jurnal Perikanan*, 14(2): 89–96.

Ruiz, H. A., R. M. Rodríguez-Jasso, A. Hernandez-Almanza, J. C. Contreras-Esquivel, and C. N. Aguilar. 2017. Pectinolytic Enzymes. In: A Pandey, S. Negi and C.R. Soccol (Eds.) Current Developments in Biotechnology and Bioengineering:



- Production, Isolation and Purification of Industrial Products. Elsevier. Amsterdam, p: 47-71.
- Rukmana, R. 1997. Ikan Nila, Budidaya dan Prospek Agribisnis. Kanisius, Yogyakarta.
- Saanin H. 1984. Taksonomi dan Kunci Identifikasi Ikan. Binacipta, Bandung.
- Sari, I.P., Yulisman dan Muslim. 2017. Laju pertumbuhan dan efisiensi pakan ikan nila (*Oreochromis niloticus*) yang dipelihara dalam kolam terpal yang dipuaskan secara periodik. Jurnal Akuakultur Rawa Indonesia, 5(1): 45-55.
- Satia, Y., P. Octorina dan Yulfiperius. 2011. Kebiasaan makanan ikan nila (*Oreochromis niloticus*) di danau bekas galian pasir gekbrong Cianjur-Jawa Barat. Jurnal Agroqua, 9(1): 1-7.
- Sheppy, C. 2001. The Current Feed Enzyme Market and Likely Trends In: M.R. Bedford and G.G. Partridge (Eds.) Enzymes in Farm Animal Nutrition. CABI Publishing, Wallingford, p: 1-10.
- Sianturi, D.C. 2008. Isolasi Bakteri dan Uji Aktivitas Amilase Termofil Kasar dari Sumber Air Panas Penen Sibirubiru Sumatera Utara. Universitas Sumatera Utara. Master Thesis.
- Sindhu, R., P. Binod and A. Pandey. 2017. α -Amylases In: A Pandey, S. Negi and C.R. Soccol (Eds.) Current Developments in Biotechnology and Bioengineering: Production, Isolation and Purification of Industrial Products. Elsevier, Amsterdam, p: 3-24.
- Singhania, R. R., M. Adsul, A. Pandey and A. K. Patel. 2017. Cellulases In: A Pandey, S. Negi and C.R. Soccol (Eds.) Current Developments in Biotechnology and Bioengineering: Production, Isolation and Purification of Industrial Products. Elsevier, Amsterdam, p: 73-101.
- Siregar, A. D. 2003. Pakan Ikan Alami. Kanisius, Yogyakarta.
- Stickney, R. R. 1979. Principles of Warmwater Aquaculture. John Wiley and Sons, Inc, New York.
- Sucipto, A. dan Prihartono. 2005. Pembesaran Nila Merah Bangkok. Penebar Swadaya, Jakarta.
- Thomas, L., A. Joseph, R.R. Singhania, A.K. Patel and A. Pandey. 2017. Industrial Enzymes: Xylanases In: A Pandey, S. Negi and C.R. Soccol (Eds.) Current Developments in Biotechnology and Bioengineering: Production, Isolation and Purification of Industrial Products. Elsevier, Amsterdam, p: 127-148.
- Thongprajukaew, K., S. Kovitvadhi, U. Kovitvadhi and P. Prerame. 2017. Effects of feeding frequency on growth performance and digestive enzyme activity of sex-reversed nile tilapia, *Oreochromis niloticus* (Linnaeus, 1758). Agriculture and Natural Resources, 51: 292-298.



- Ushasree, M.V., J. Vidya and A. Pandey. 2017. Other Enzymes: Phytases *In: A* Pandey, S. Negi and C.R. Soccol (Eds.) Current Developments in Biotechnology and Bioengineering: Production, Isolation and Purification of Industrial Products. Elsevier, Amsterdam, p: 309-333.
- Vaseekaran, S., S. Balakumar and V. Arasaratnam. 2010. Isolation and identification of a bacterial strain producing thermostable α -amylase. Tropical Agricultural Research, 22(1): 1-11.
- Vinasyiam, A., M.A. Suprayudi dan Alimuddin. Aktivitas enzim pencernaan pada *Oreochromis niloticus* yang diberi pakan mengandung hormon pertumbuhan rekombinan. Jurnal Akuakultur Indonesia, 15(1): 15-23.
- Wallace, J.L. 2015. Potential of Exogenous Enzymes in Low Fish Meal Diets to Improve Nutrient Digestibility and Sustainability of Farmed Tilapia in Thailand. University of Stirling. Scotland. Disertasi Doktor.
- Watanabe, W.O., J.H. Clark, J.B. Dunham, R.I. Wicklund and B.L. Olla. 1990. Culture of Florida red tilapia in marine cages: the effect of stocking density and dietary protein on growth. Aquaculture, 90(2): 123-134.
- Weatherley, A.H. 1972. Growth and Ecology of Fish Populations. Academic Press, New York.
- Wilson, R.P. 1994. Utilization of dietary carbohydrate by fish. Aquaculture, 124: 67-80.
- Yu, G., P. He, L. Shao and D. Lee. 2007. Enzyme activities in activated sludge flocs. Applied Microbiology and Biotechnology, 77: 605-612.
- Zonneveld, N.E.A., E.A. Huissman and J.H. Boon. 1991. Prinsip-Prinsip Budidaya Ikan. Gramedia, Jakarta.