

DAFTAR PUSTAKA

- Allan, G.L. & Maguire, G.B. 1991. Lethal Levels of Low Dissolved Oxygen and Effects of Short-term Oxygen Stress on Subsequent Growth of Juvenile *Penaeus monodon*. *Aquaculture*, 94: 27–37.
- Alvarez-Leefmans, F. J., Giraldez, F., & Gamino, S. M. 1987. Intracellular free magnesium in excitable cells: its measurement and its biologic significance. *Canadian journal of physiology and pharmacology*, 65(5): 915-925.
- Ambeng, Ruslan, M. R., & Mangawe, V. G. (2006). Konsumsi Oksigen Udang Vannamei (*Litopenaeus vannamei*) Berdasarkan Berat Tubuh. *BIO/MA*, 1(2): 190–197.
- Anggoro, S., Suprapto, D., & Purwanti, F. (2018). Osmoregulation Pattern of Fingerling Vanname Shrimp (*Litopenaeus vannamei*) Rearing in Three Molt Stage Iso-Osmotic Media. 23(3): 119–122.
- Anggoro, S., Nakamura, K. 2005. Osmotic Response and Feeding Pattern of Kuruma Shrimp (*Penaeus japonicus*) at Various Molting Stages. Research Report. Lab of Propagation Physiology. Scientific article 11. Fisheries fac. Kagoshima University, Kagoshima.
- Antony, J., Vungurala, H., Saharan, N., Reddy, A. K., Chadha, N. K., Lakra, W. S., & Roy, L. A. (2015). Effects of salinity and Na+/K+ ratio on osmoregulation and growth performance of black tiger prawn, *Penaeus monodon* Fabricius, 1798, juveniles reared in inland saline water. *Journal of the World Aquaculture Society*, 46(2): 171-182.
- Araneda, M., Gasca-Leyva, E., Vela, M. A., & Domínguez-May, R. 2020. Effects of Temperature and Stocking Density on Intensive Culture of Pacific White Shrimp in Freshwater. *Journal of Thermal Biology*, 94: 102756.
- Ariadi, H., Madusari, B. D., & Mardhiyana, D. 2022. Analisis Pengaruh Daya Dukung Lingkungan Budidaya Terhadap Laju Pertumbuhan Udang Vaname (*L. vannamei*). *Enviro Scienreae*, 18(1): 29–37.
- Arifin, M. Y., Supriyono, E., & Widanarni, D. 2014. Total Hemosit, Glukosa dan Survival Rate Udang Mantis (*Harpisquilla raphidea*) Pasca Transportasi dengan Dua Sistem yang Berbeda. *Jurnal Kelautan Nasional*, 9(2), 111–119.
- Arrokhman, S., Abdulgani, N., & Hidayati, D. 2012. Survival Rate Ikan Bawal Bintang (*Trachinotus blochii*) dalam Media Pemeliharaan Menggunakan Rekayasa Salinitas. *Jurnal Sains dan Seni ITS*, 1(1): E32-E35.
- Arwiyah, A., Zainuri, M., & Efendy, M. (2015). Studi kandungan NaCl di dalam air baku dan garam yang dihasilkan serta produktivitas lahan garam menggunakan media meja garam yang berbeda. *Jurnal Kelautan: Indonesian Journal of Marine Science and Technology*, 8(1): 1-9.



WWF (Better Management Practice “Budidaya Udang Vannamei - Tambak Semi Intensif dengan Instalasi Pengolahan Air Limbah (IPAL).”

Ayuningrum, S. B., Istiqomah, I., Rustadi, R., Triyatmo, B., Isnansetyo, A., Budhijanto, W., & Deendarlianto, D. Protective Effect of Microbubble Aeration and Dietary Probiotics BALSS on Survival and Immunity of White Leg Shrimp (*Litopenaeus vannamei*) Postlarvae against Acute Low Salinity Stres. Jurnal Perikanan Universitas Gadjah Mada, 22(1): 1-7

Babu, P. S., Razvi, S. S. H., Venugopal, G., Ramireddy, P., Mohan, K. M., Rao, P. S., & Ananthan, P. S. 2014. Growth and Production Performance of Pacific White Leg shrimp (*Litopenaeus vannamei* Boone, 1931) in Low Stocking Short Term Farming in Earthen Pond Conditions. Indian Journal of Fisheries, 61(4): 68-72.

Begg, K., & Pankhurst, N. W. 2004. Endocrine and Metabolic Responses to Stres in a Laboratory Population of the Tropical Damselfish (*Acanthochromis polyacanthus*). Journal of Fish Biology, 64(1): 133-145.

Boyd, C. E. & Lichtkoppler, F. 1979. Water Quality Management in Pond Fish Culture. Research and Development, 22. Auburn University. Alabama.

Boyd, C.E.1990. Water Quality in Ponds for Aquaculture. Birmingham Alabama: Alabama Agricultural Experiment Station. Auburn University.

Boyd, C.E. 2017. General Relationship Between Water Quality and Aquaculture Performance in Ponds. In: G. Jeney (Eds). Fish Diseases: Prevention and Control Strategies. Academic Press. Cambridge, MA. 147-166.

Bradley, T. J. 2009. Animal Osmoregulation. Oxford University Press.

Budiardi, T., Batara, T., & Wahjuningrum. 2005. Tingkat Konsumsi Oksigen Udang Vaname (*Litopenaeus vannamei*) dan Model Pengelolaan Oksigen pada Tambak Intensif. Jurnal Akuakultur Indonesia, 4(1): 89–96.

Bull, E. G., Cunha, C. D. L., & Scudelari, A. C. 2020. Water Quality Impact from Shrimp Farming Effluents in a Tropical Estuary. Water Science and Technology, 83(1): 123-136.

Chakravarty, M. S., Ganesh, P. R. C., Amarnath, D., Sudha, B. S., & Babu, T. S. 2016. Spatial variation of water quality parameters of shrimp (*Litopenaeus vannamei*) culture ponds at Narsapurapupeta, Kajuluru and Kaikavolu villages of East Godavari district, Andhra Pradesh. *International Journal of Fisheries and Aquatic Studies*, 4(4): 390-395.

Cheng, W., Liu, C.H., & Kuo, C.M. 2003. Effects of Dissolved Oxygen on Hemolymph Parameters of Freshwater Giant Prawn (*Macrobrachium rosenbergii*). Aquaculture, 220: 843–856.

Cuzon, G., Lawrence, A., Gaxiol, G., Rosa, C., & Guillaume, J. 2004. Nutrition of *Litopenaeus vannamei* Reared in Tanks or in Ponds. Aquaculture, 235: 513–551.



- Dwiono, A., Widigdo, B., & Soewardi, K. (2018). Pengaruh Komposisi Mineral Air Tanah Terhadap Fisiologi dan Histologi Udang Vaname (*Litopenaeus vannamei*). *Jurnal Ilmu Dan Teknologi Kelautan Tropis*, 10(3), 535–546.
- Erlangga, E. 2012. Budidaya Udang Vannamei Secara Intensif. Pustaka Agro Mandiri. Tangerang Selatan.
- Fadillah, N., Waspodo, S., & Azhar, F. 2019. Penambahan Ekstrak Daun Mangrove Rhizophora apiculata pada Pakan Udang Vaname (*Litopenaeus vannamei*) untuk Pencegahan Vibriosis. *Journal of Aquaculture Science*, 4(2): 91-101.
- Ferraris, R. P., Parado-Estepa, F. D., Ladia, J. M. and De Jesus, E. G. 1986. Effect of Salinity on the Osmotic, Chloride, Total Protein and Calcium Concentrations in the *Haemolymph* of the Prawn *Penaeus monodon* (Fabricius). *Comp. Biochem. Physiol*, 83A, 701-708.
- Floyd, R. 2009. Stres its role in fish disease. University of Florida, Florida.
- Fofonoff, P.W., G.M. Ruiz, B. Steves, C. Simkanin and J.T. Carlton. 2021. National exotic marine and estuarine species information system. <http://invasions.si.edu/nemesis/> (diakses 27 Oktober 2021).
- Frence, R. L. 1983. Respons of The Crayfish *Orconectes virilis* to Experimental Acidification of The Lake with Special Reference to The Importance of Calcium. In C. R. Goldman (ed). Freshwater Crayfish V. AVI Publ Comp, INC, Westport.
- Gao, W., Tian, L., Huang, T., Yao, M., Hu, W., & Xu, Q. 2016. Effect of Salinity on the Growth Performance, Osmolarity and Metabolism-Related Gene Expression in White Shrimp *Litopenaeus vannamei*. *Aquaculture Reports*, 4: 125-129.
- Greenway, P. 1974. Calcium Balance at The Postmolting Stage of The Freshwater Crayfish *Austropotamobius pallipes* (*Lereboullet*). *J.Exp.Bio*: 61.
- Haliman, R. W. dan Adijaya, S. 2006. *Udang Vanamei*. Penebar Swadaya. Bogor.
- Hill, A.D., Taylor, A.C., & Strang, R.H.C. 1991. Physiological and Metabolic Responses of the Shore Crab *Carcinus maenas* (L.) During Environmental Anoxia and Subsequent Recovery. *J. Exp. Mar. Biol. Ecol.*, 150: 31– 50.
- H.Lama, A. W., Darmawati, & wahyu, F. 2020. Optimasi Padat Tebar Terhadap Pertumbuhan dan Kelangsungan Hidup Udang Vaname (*Litopenaeus vannamei*) dengan Sistem Resirkulasi. *Octopus : Jurnal Ilmu Perikanan* , 9(1): 48–52.
- Jaffer, Y. D., Saraswathy, R., Ishfaq, M., Antony, J., Bundela, D. S., & Sharma, P. C. 2020. Effect of Low Salinity on the Growth and Survival of Juvenile Pacific White Shrimp, *Penaeus vannamei*: A revival. *Aquaculture*, 515: 734561.
- Jory, D. 2019. Shrimps. In: J. S. Lucas, P. C. Southgate, & C. S. Tucker (Eds.). *Aquaculture: Farming Aquatic Animals and Plants*. Wiley Blackwell. Hoboken. 499-526.



Karim, M. Y. 2007. Pengaruh Salinitas Terhadap Metabolisme Kepiting Bakau (*Scylla olivacea*). Jurnal Perikanan Universitas Gadjah Mada, 10(1): 37-44.

Kusmini, I.I., Wartono, H., & Elinda P.S. 2006. Suhu Terbaik Untuk Laju Pertumbuhan dan Sintasan Benih Lobster Air Tawar (*Cherax quadricarinatus*). Jurnal Riset Akuakultur, 1(1): 67–72.

Laramore, S. 2015. Increasing Shrimp Production in Florida by Establishing Environmental Mineral Guidelines for Low-Salinity Shrimp Culture Operations. FDACS Contract Final Report. Florida. 32 p.

Li, Y., Li, J., & Wang, Q. 2006. The Effects of Dissolved Oxygen Concentration and Stocking Density on Growth and Non-Specific Immunity Factors in Chinese Shrimp (*Fenneropenaeus chinensis*). Aquaculture, 256(1-4): 608-616.

Liu, G., Zhu, S., Liu, D., Guo, X., & Ye, Z. 2017. Effects of Stocking Density of the White Shrimp (*Litopenaeus Vannamei* Boone) on Immunities, Antioxidant Status, and Resistance Against *Vibrio harveyi* in a Biofloc System. Fish & Shellfish Immunology, 67: 19-26.

Long, L., H. Zhang, Q. Ni, H. Liu, F. Wu & X. Wang. 2019. Effects of Stocking Density on Growth, Stress, and Immune Responses of Juvenile Chinese sturgeon (*Acipenser sinensis*) in a Recirculating Aquaculture System. Comparative Biochemistry and Physiology, Part C. 219: 25-34.

Losordo, T. M. & H. Westers. 1994. System Carrying Capacity and Flow Estimation. In: Timmons, M. B. & T. M. Losordo (Eds) Aquaculture Water Reuse System. Engineering Design and Management. Elsevier Press. Amsterdam.

Maghfiroh, A., Anggoro, S., & Wahyu, P. 2019. Pola Osmoregulasi Faktor Kondisi Udang Vaname (*Litopenaeus vannamei*) yang Dikultivasi di Tambak Intensif Mojo Ulujami Pemalang. JOURNAL OF MAQUARES, 8(3): 177–184.

Mantel, L. H. and Farmer, L. L. 1983. Osmotic and Ionic Regulation. In: The Biology of Crustacea, Vol. 5. Mantel, L. H. Ed., Academic Press, New York.

McConaughey, B.H., Zottoli, R. 1983. Introduction to Marine Biology. 4th ed. The C.V. Mosby Company, London.

McEwen, B. S. 1998. Stress, Adaptation, and Disease: Allostasis and Allostatic Load. Annals of the New York Academy of Sciences, 840(1): 33-44.

McNamara, J. C., & Faria, S. C. 2012. Evolution of osmoregulatory patterns and gill ion transport mechanisms in the decapod Crustacea: a review. Journal of Comparative Physiology B, 182(8): 997-1014.

Myrick, C. A. 2011. Aquaculture: Physiology of Fish in Culture Environments. Encyclopedia of Fish Physiology: 2084–2089.

Nybakken, J.W. 1990. An Ecological Approach. Marine Biology : 289.



Pinto, P. H. O., Rocha, J. L., do Vale Figueiredo, J. P., Carneiro, R. F. S., Damian, C., de Oliveira, L., & Seiffert, W. Q. 2020. Culture of Marine Shrimp (*Litopenaeus vannamei*) in Biofloc Technology System Using Artificially Salinized Freshwater: Zootechnical Performance, Economics and Nutritional Quality. Aquaculture, 520: 734960.

Ponce-Palafox, J., Martinez-Palacios, C. A., & Ross, L. G. 1997. The effects of salinity and temperature on the growth and survival rates of juvenile white shrimp, *Penaeus vannamei*, Boone, 1931. Aquaculture, 157(1-2): 107-115.

Prangnell, D.I., T.M. Samocha, N. Staresinic. 2019. Water. In: Prangnell, D.I. (Eds). Sustainable Biofloc Systems for Marine Shrimp. Academic Press. Cambridge, MA. 37-59.

Pujiastuti, C. 2008. Kajian Penurunan Ca dan Mg Air Laut Menggunakan Resin (DOWEX). Jurnal Teknik Kimia, 3(1):199.

Rachmawati, D., Hutabarat, J., & Anggoro, S. 2012. Pengaruh Salinitas Media Berbeda Terhadap Pertumbuhan Keong Macan (*Babylonia spirata* L.) Pada Proses Domestikasi. Ilmu Kelautan, 17(3): 141–147.

Rakhfid, A., B. Nur, B. Muh, dan F. Fendi. 2017. Pertumbuhan dan kelangsungan hidup udang vaname (*Litopenaeus vannamei*) pada padat tebar berbeda. Jurnal Akuakultur 1(2): 1-6.

Roy, L. A., Davis, D. A., Saoud, I. P., & Henry, R. P. 2007. Branchial carbonic anhydrase activity and ninhydrin positive substances in the Pacific white shrimp, *Litopenaeus vannamei*, acclimated to low and high salinities. Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology, 147: 404–411.

Roy, L. A., Davis, D. A., Saoud, I. P., Boyd, C. A., Pine, H. J., & Boyd, C. E. 2010. Shrimp Culture in Inland Low Salinity Waters. Reviews in Aquaculture, 2(4): 191-208.

Salsabiela, M. (2020). Pola Osmoregulasi Udang Vanamei (*Litopenaeus vannamei*) Dewasa yang Diablas dan Dikultivasi pada Berbagai Tingkat Salinitas. Gema Wiralodra, 11(1): 143–153.

Septiningsih, E., Tampangallo, B. R., Hidayat, D., & Suwoyo, S. 2015. Perubahan Konsentrasi Haematologi Akibat Panen Parsial Udang Vaname (*Litopenaeus vannamei*) pada Budidaya Superintensif. Prosiding Forum Inovasi Teknologi Akuakultur: 1117–1122.

Sidabutar, E. A., Sartimbul, A., & Handayani, M. (2019). Distribusi suhu, salinitas dan oksigen terlarut terhadap kedalaman di Perairan Teluk Prigi Kabupaten Trenggalek. JFMR (Journal of Fisheries and Marine Research), 3(1): 46-52.

Soetrisno, Y. 2011. Pengembangan Budidaya Udang dan Potensi Pencemarannya Pada Perairan Pesisir. Jurnal Teknologi Lingkungan, 5(3).



K. 2000. Respon Udang Vaname (*Litopenaeus vannamei*) Terhadap Media Air Laut yang Berbeda. Jurnal Ilmu-Ilmu Perairan dan Perikanan Indonesia, 13(2): 165-169.

Stigebrandt, A. 2011. Carrying capacity: General principles of model construction. *Aquaculture Research*, 42(SUPPL. 1): 41–50.

Suharyadi. 2012. Budidaya Udang Vaname (*Litopenaeus vannamei*). Kementerian Kelautan dan Perikanan. BPSDMKP PUSLUHKP. Jakarta.

Sumada, K., Dewati, R., & Suprihatin, S. 2016. Garam industri berbahan baku garam krosok dengan metode pencucian dan evaporasi. *Jurnal Teknik Kimia*, 11(1): 30-36.

Supriatna, M., Hariati, A. M., & Mahmudi, M. 2017. Dissolved oxygen models in intensive culture of whiteleg shrimp, *Litopenaeus vannamei*. East Java, Indonesia. AACL Bioflux, 10(4): 768-778.

Tallima, H., & El Ridi, R. 2018. Arachidonic Acid: Physiological Roles and Potential Health Benefits - Review. *Journal of Advanced Research*, 11: 33-41.

Venkateswarlu, V., & Venkatrayulu, C. 2019. Prevalence of Disease Problems Affecting Shrimp (*Litopenaeus vannamei*) Farming in Andhra Pradesh, India. *International Journal of Fisheries and Aquatic Studies*, 7: 275-279.

Vijayan, M. M., & Moon, T. W. 1992. Acute Handling Stress Alters Hepatic Glycogen Metabolism in Food Deprived Rainbow trout (*Oncorhynchus mykiss*). *Canadian Journal of Fisheries and Aquatic Sciences*, 49(11): 2260-2266.

Waser, W.P. & Heisler, N. 2004. Oxygen Delivery to the Fish Eye: Blood Flow in the Pseudobranchial Artery of Rainbow Trout (*Oncorhynchus mykiss*). *Fish Physiology and Biochemistry*, 30: 77–85.

Wendelaar Bonga, S. E. 1997. The Stress Response in Fish. *Physiological Reviews*, 77(3): 591-625.

Widodo, A. F., Pantjara, B., Adhiyudanto, N. B., & Rachmansyah, R. (2011). Performansi Fisiologis Udang Vaname, *Litopenaeus Vannamei* yang Dipelihara pada Media Air Tawar dengan Aplikasi Kalium. *Jurnal Riset Akuakultur*, 6(2): 225-241.

Willmer, P., Stone, G., & Johnston, I. 2009. *Environmental physiology of animals*. John Wiley & Sons.

Xiao, J., Li, Q. Y., Tu, J. P., Chen, X. L., Chen, X. H., Liu, Q. Y., & Wang, H. L. 2019. Stress Response and Tolerance Mechanisms of Ammonia Exposure Based on Transcriptomics and Metabolomics in *Litopenaeus vannamei*. *Ecotoxicology and Environmental safety*, 180: 491-500.

Xu, Z., Regenstein, J. M., Xie, D., Lu, W., Ren, X., Yuan, J., & Mao, L. 2018. The Oxidative Stress and Antioxidant Responses of *Litopenaeus vannamei* to Low Temperature and Air Exposure. *Fish & Shellfish Immunology*, 72: 564-571.



Pengaruh Padat Tebar dan Salinitas Air Payau Buatan Terhadap Pertumbuhan dan Performa Fisiologis

Udang Vaname (*Litopenaeus vannamei* Boone, 1931)

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Universitas Gadjah Mada, 2020. Dipublikasikan di <http://repository.ugm.ac.id/>

R. & Hans, A. (2020). Pengaruh Penambahan Kapur Dolomite Dan Kapur Tohor Dalam Media Pemeliharaan Terhadap Moulting, Pertumbuhan Dan Sintasan Udang Vaname (*Litopenaeus Vannamei*), 9: 1.

Yustiati, A., Sidiq Pribadi, S., Rizal, A., Walim Lili, U., & Ubr, S. 2017. Pengaruh Kepadatan Pada Pengangkutan dengan Suhu Rendah Terhadap Kadar Glukosa dan Darah Kelulusan Hidup Ikan Nila (*Oreochromis niloticus*) Density Influence of Transportation with Cold Water System on Blood Glucose Levels and Survival Rate in Tilapia (*Oreochromis niloticus*). In *Jurnal Akuatika Indonesia*, 2: 2.

Zhang, K., Pan, L., Chen, W., & Wang, C. 2015. Effect of Using Sodium Bicarbonate to Adjust the pH to Different Levels on Water Quality, the Growth and the Immune Response of Shrimp *Litopenaeus vannamei* Reared in Zero Water Exchange Biofloc Based Culture Tanks. *Aquaculture Research*, 48(3): 1194-1208.