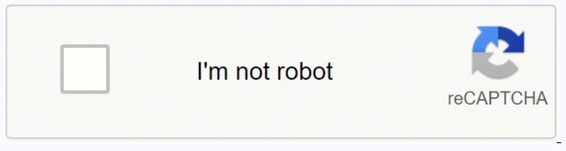

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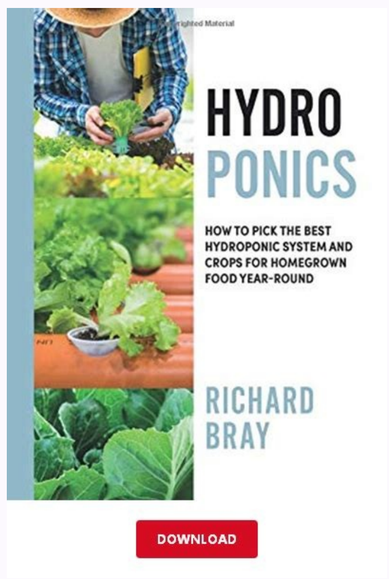

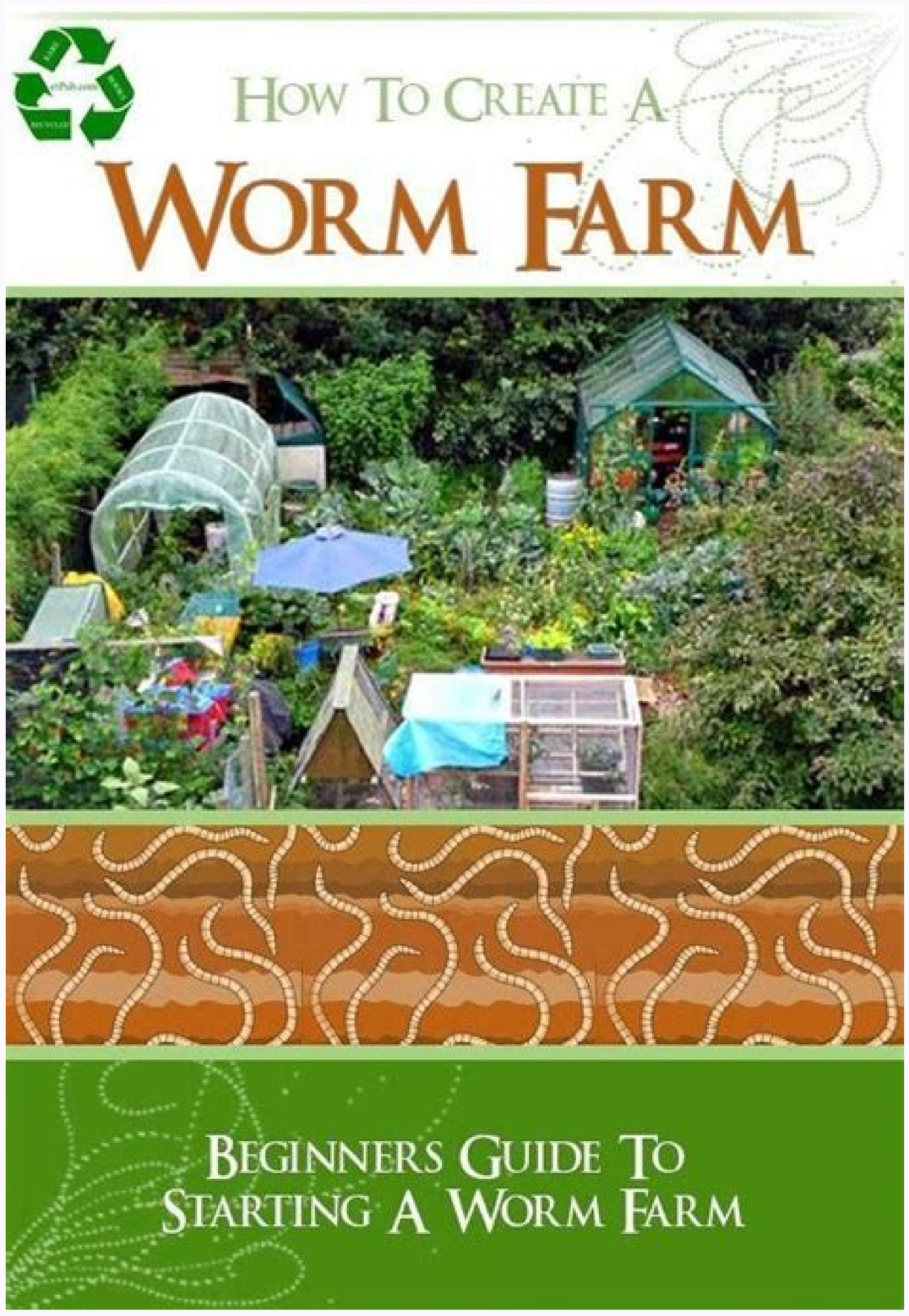

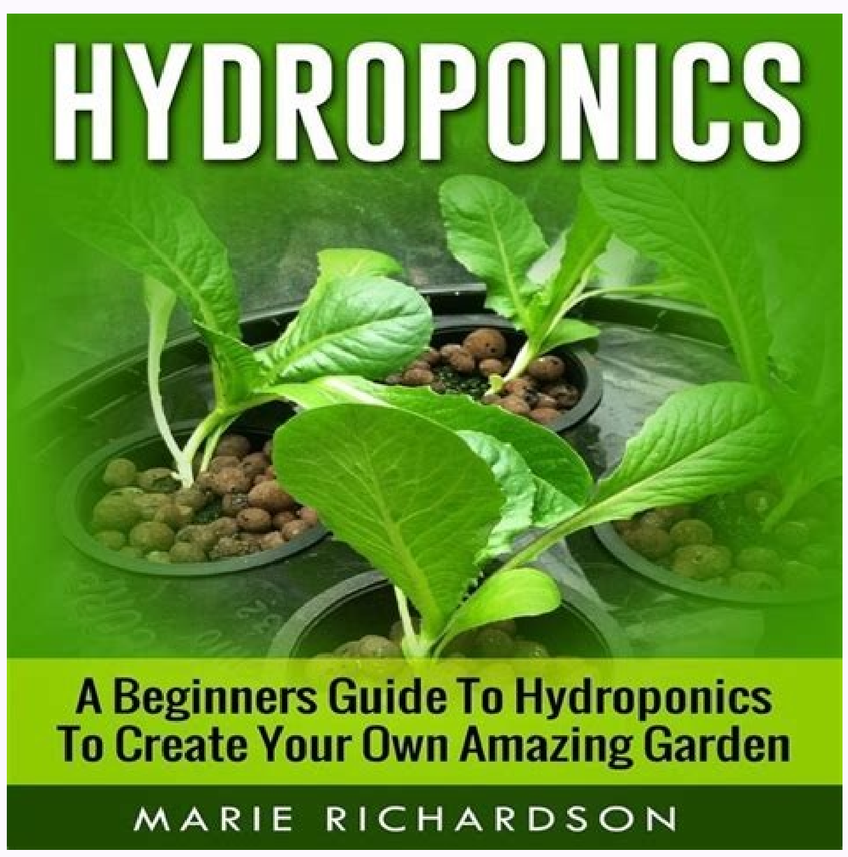

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Feed Management 8. Boletin Nicovita. Stoichiometric calculations were poorly applied in some cases, leading to N-compounds issues, and therefore high water exchange rates were frequently observed. 88:102040. Showing 1-42 Start your review of Shrimp Aquarium: A Complete Beginner’s Guide to Setup and Maintain Freshwater Shrimp Aquarium (Shrimp Aquarium, Shrimp Keeping, Shrimp Farming, Aquarium. B., Guimarães, A. Currently, BFT has been applied in the nursery (especially in the Americas and, more recently, Asia) and grow-out phases. Production performance, inorganic nitrogen control and bacterial community characteristics in a controlled biofloc-based system for indoor and outdoor super-intensive culture of Litopenaeus vannamei. doi: 10.1016/j.aquaeng.2021.102192 CrossRef Full Text | Google Scholar Ray, A. doi: 10.1080/08927010902853516 PubMed Abstract | CrossRef Full Text | Google Scholar El-Sayed, A. Shrimp farming is growing worldwide, with a key driving factor being its high value in global seafood markets. Strategies for ammonium and nitrite control in Litopenaeus vannamei nursery systems with bioflocs. In this opinion manuscript, we describe some key BFT characteristics regarding its past and present, while highlighting future challenges and opportunities aiming to contribute to the sustainability of intensive shrimp farming. Burford et al. Additionally, other production strategies have been implemented and led to an increase in actual production rates; for example, the maintenance of alkalinity within optimal levels (Furtado et al., 2015), adoption of partial harvests (Da Silveira et al., 2022), artificial substrates (Legarda et al., 2018) and “bacterial-rich” inoculums from a mature tank or pond (Ferreira et al., 2020). Growth Assessment 9. doi: 10.1016/j.aquaculture.2015.08.003 CrossRef Full Text | Google Scholar Ching, C., Crespo, C., Pazmiño, A., and Ron, E. doi: 10.1016/j.aquaculture.2021.737326 CrossRef Full Text | Google Scholar Subasinghe, R., Soto, D., and Jia, J. 71, 275–283. (2020). The accumulated BFT knowledge has provided a baseline for the development of other related microbial-based (e.g., Aquamimicry, synbiotics, and semi-biofloc; Zeng et al., 2020; El-Sayed, 2021; Hussain et al., 2021), hybrid (e.g., BioRAS; Xu et al., 2020), and integrated (e.g., shrimp + fish) systems (Wright, 2015), with at least nine different variations. Aquaculture 232, 525–537. Efficient microbial management is mandatory in BFT. B., Lawson, A., and Browdy, C. Aquacult. As a result, imbalance of the microbial population and toxic N-compounds issues were commonly observed, as well as the excessive concentration of suspended solids (Ray et al., 2010), poor alkalinity (Furtado et al., 2015), and C:N ratio management (Panigrahi et al., 2019). A., Thompson, P. A practical experience at a shrimp nursery system in Vietnam. S., Redig, J. All authors contributed to the article and approved the submitted version. Biofouling 25, 413–427. However, by that time, the lack of understanding of the different components (e.g., engineering, production management, and aquatic microbiology) led to poor system control. Energy use in recirculating aquaculture systems (RAS): a review. doi: 10.1111/j.1749-7345.2011.00507.x CrossRef Full Text | Google Scholar Krummenauer, D., Poersch, L. 42, 726–733. These microbial aggregates also provide vitamins, bioactive compounds, and beneficial bacteria (probiotics) (Yu et al., 2021). C. M., and Davis, D. Hyperintensive stocking densities for Litopenaeus vannamei grow-out in biofloc technology culture system. Da Silva, B. A., Morales-Suazo, M. Summary of BFT evolution over time with key characteristics by period. As a result, the importance of farmed shrimp as a source of food, employment, and economic development is indisputable. The effects of different solids and biological filters in intensive pacific white shrimp (Litopenaeus vannamei) production systems. A., Legarda, E. Seafood Alliance 1. H., Fóes, G. Global aquaculture and its role in sustainable development. doi: 10.1016/j.ocecoaman.2012.10.006 CrossRef Full Text | Google Scholar Arnold, S., Emerenciano, M. Zootecnia 47:e20170060. (2004). 95:102192. It is very useful for beginners as almost all the necessary techniques are explained clearly. V., Cerqueira, V. Dietary supplementation with biofloc promotes growth, improves immune and antioxidant status, and upregulates NF-κB/Nrf2 signalling molecules and stress resistance in Rhynchocypris lagowskii Dybowski. 51, 1290–1300. (2017). J., Seaborn, G., Leffler, J. Continuous and pulse-feeding application of multispecies probiotic bacteria in whiteleg shrimp, Litopenaeus vannamei. P., Bolivar, N., and Seiffert, W. T., and Wasielesky, W. (2015). Sea lettuce integrated with Pacific white shrimp and mullet cultivation in biofloc impact system performance and the sea lettuce nutritional composition. C., Poersch, L. M. doi: 10.1016/j.aquaculture.2010.10.019 CrossRef Full Text | Google Scholar Reis, J., Peixoto, S., Soares, R., Rhodes, M., Ching, C., and Davis, A. Predator Control 10. H., Fóes, G., Lara, G., and Wasielesky, W. doi: 10.1111/jwas.12640 CrossRef Full Text | Google Scholar Krummenauer, D., Peixoto, S., Cavalli, R. A., et al. Effect of supplementing heterotrophic and photoautotrophic biofloc, on the production response, physiological condition and post-harvest quality of the whiteleg shrimp, Litopenaeus vannamei. (2010). In terms of solids, some strategies have been adopted in small operations, e.g., clarifiers (Ray et al., 2010), RAS filtration systems and skimmers (Fleckenstein et al., 2020); and in large-scale farms, the solids are concentrated and removed through “shrimp toilets” by limited water exchanges (Afroz and Alam, 2013). C., and Emerenciano, M. Food and Agriculture Organization of the United Nations. 18:100479. doi: 10.1016/j.aquaculture.2015.10.028 CrossRef Full Text | Google Scholar Ulloa-Walker, D. doi: 10.1016/j.aquaculture.2020.735749 CrossRef Full Text | Google Scholar Xu, W., Xu, Y., Su, H., Hu, X., Yang, K., Wen, G., et al. G., Wang, X., Chen, L., Xu, C., et al. Although such technique was conceived to close the gap toward sustainable aquatic production, constraints such as high energy costs and proper management of the residual solids remain unsolved (Ray et al., 2010). 50, 29–41. The BFT contributes to nutrient optimization as studies reported that bioflocs could contribute to ~20% of the protein required by shrimp (Avnimelech, 2012). Discussion: Future Challenges and Opportunities Past and present are supporting the BFT future development. Moreover, tailored feeds, broader access to postlarvae from BFT-tailored breeding programs and BFT applied to other penaeid species are also expected. The COVID 19 pandemic forced shrimp farmers globally to be much more efficient in managing production costs. Biofloc technology: principles focused on potential species and the case study of Chilean river shrimp Cryphiops caementarius. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher. Avnimelech, Y. Soc. Review of current disease threats for cultivated penaeid shrimp in Asia. doi: 10.1007/s10499-016-0019-8 CrossRef Full Text | Google Scholar Legarda, E. She often talks about reef tanks which The problem with this book is the editing it is like english is not the author language. Substitution of fishmeal with microbial floc meal and soy protein concentrate in diets for the pacific white shrimp Litopenaeus vannamei. A., Martins, M. The technique evolved from an experimental system to become a large-scale production system applied in many countries, particularly in the nursery phase. 12, 1759–1782. Aquac. References Afroz, T., and Alam, S. S., Silva, V. Aquaculture 452, 69–87. doi: 10.1016/j.aquaculture.2018.08.045 CrossRef Full Text | Google Scholar Rahman, A., Xi, M., Dabrowski, J. (2012). Google Scholar Ferreira, G. B., Wasielesky, W. Regardless of the strategy, proper waste management is a current challenge. Although vastly improved, issues with N-compounds and management of suspended solids persist in some farms leading to poor growth, low DO levels, pathogenic vibrio outbreaks, and eventually mortalities. The State of World Fisheries and Aquaculture 2020: Sustainability in Action. In terms of shrimp performance, water quality parameters in optimal levels, proper feed management, and desirable microbial profile of the water are key points in BFT. (2016). doi: 10.1016/j.aquaculture.2012.02.023 CrossRef Full Text | Google Scholar Boaventura, M., Hetzel, G., Huynh Tran, C., Bakker, S., and Marc, C. (2020) described and highlighted promising results with non-L. doi: 10.1016/j.aquaculture.2021.736905 CrossRef Full Text | Google Scholar Kesselring, J. H. Biofloc contribution to antioxidant defence status, lipid nutrition and reproductive performance of broodstock of the shrimp Litopenaeus stylirostris: consequences for the quality of eggs and larvae. (2022). Water Quality Management 7. For that, alternative processes and energy sources (Badiola et al., 2018), Integrated Multi-trophic Aquaculture (IMTA) (Poli et al., 2019; Holanda et al., 2020; Legarda et al., 2021), and new recycling options for the wastes generated (solid and liquid fractions) could enhance the circularity of BFT (Bauer et al., 2012), ultimately generating “green-labelable” products and promoting the creation of startups focused on sustainable solutions (Subasinghe et al., 2009). J., Mcintosh, R. R. Passive acoustic monitoring as a tool to assess feed response and growth of shrimp in ponds and research systems. Farm Designing 2. During the evolution process, a wide variety of designs, conditions, strategies, and equipment have been evaluated, including aeration systems (Lara et al., 2017); clarification methods (Ray et al., 2010); water depths (Krummenauer et al., 2016), indoor and outdoor conditions (Xu et al., 2021), and stocking densities (Krummenauer et al., 2011; Da Silveira et al., 2020). Butyrate and propionate improve the growth performance of Litopenaeus vannamei. Effect of carbon and nitrogen ratio (C:N) manipulation on the production performance and immunity of Pacific white shrimp Litopenaeus vannamei (Boone, 1931) in a biofloc-based rearing system. A., Machado, C., et al. I don't recommend this book at all. P., Krummenauer, D., Poersch, L. The description of different shrimp was very helpful. Pond Preparation 3. Aquaculture 498, 83–89. BFT in Shrimp Farming: Past The BFT system originated in the 1970s at the French Research Institute for Exploitation of the Sea (IFREMER) located in Tahiti, French Polynesia. Conclusions/Opinion Biofloc technology (hybrid and other microbial-based systems) can widely contribute to the sustainable intensification of shrimp production. Aquaculture 452, 252–262. Expected Profitability, etc. Aquaculture 508, 60–65. doi: 10.1016/j.aquaculture.2021.737408 CrossRef Full Text | Google Scholar Da Silveira, L. Harvesting and Marketing Apart from the above, the following annexures are also given to readers to make them understand more: 1. A., Little, B., Rahman, A., and Perrin, T. W., and Takarina, N. The effect of partial harvest on production and growth performance of Litopenaeus vannamei reared in biofloc technologic system. (2019). Aquaculture 534:736265. doi: 10.1016/j.aquaculture.2020.736265 CrossRef Full Text | Google

Scholar Martinez-Porchas, M., Ezquerra-Brauer, M., Mendoza-Cano, F., Higuera, J. Biofloc Technology: A Practical Guide Book. L. doi: 10.1016/j.aquaculture.2016.09.002 CrossRef Full Text | Google Scholar Lara, G., Krummenauer, D., Abreu, P. Jr, and Poersch, L. Aquaculture 310, 130–138. C., Barcelos, S. Locations once considered unsuitable for shrimp farming are now starting to produce in indoor closed systems (e.g., Germany and Canada), mainly due to the advances in technology over previous years in genetics, nutrition, engineering, and management in particular (El-Sayed, 2021). doi: 10.1111/are.12520 CrossRef Full Text | Google Scholar Da Silveira, L. doi: 10.1016/j.aqrep.2019.100257 CrossRef Full Text | Google Scholar Panigrahi, A., Sundaram, M., Chakrapani, S., Rajasekar, S., Syama Dayal, J., and Chavali, G. J., Mcculloch, J., Arnold, S., Rana, M., et al. These processes can optimize the use of resources, speed up and maintain the nitrification process and improve the water quality parameters. Ocean Coastal Manage. Regarding water quality, new aeration systems are emerging (Susanti et al., 2021) but still need validation at a larger scale. A., and Do Nascimento Vieira, F. ...more Mar 25, 2020 Kim Jenkins rated it it was amazing Great information on shrimp and plantsThe information on setting upa tank is beneficial for beginners. (2009). Collaboration drives innovations in super-intensive indoor shrimp farming. Burford, M. W., Wilde, S. E., Vieira, F. Aquaculture 542:736905. Publisher's Note All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Initial studies documented that biofloc consumption did not impact the post-harvest sensorial attributes (Martinez-Porchas et al., 2020). Water 12:3000. R., Sampaio, L. 27, 225–239. Also enumerated are the common aquaculture methods and the types of aquaculture based on the culture system and the type of water (i.e. freshwater, brackish water and marine). In addition, considering the higher production costs compared to traditional low-input systems, the commercialization and post-harvest aspects are crucial to guarantee the resilience and competitiveness of BFT-based shrimp farms. Sistemas Multifasicos: Una oportunidad para crecer. Aquaculture 531:735749. Res. X., and Wu, L. Rep. The major contents are as follows: 1. doi: 10.1051/bioconf/20213305005 PubMed Abstract | CrossRef Full Text | Google Scholar Thitamadee, S., Prachumwat, A., Srisala, J., Jaroenlak, P., Salachan, P. Highlights of the Proposed Species 6. Author Contributions ME: article conceptualization, writing, and review. It is not just the grammar mistakes it is the way she uses words that make the sentences awkward. doi: 10.3390/w12113000 CrossRef Full Text | Google Scholar Yu, Z., Dai, Z. However, few initiatives have been reported at larger scales, and future adoptions are foreseen, especially in the nursery phase. Especially in medium-large operations, the adoption of economic modellings and sensitivity analysis, precision farming technologies, holistic health monitoring, and improved biosecurity protocols will help identify opportunities to reduce costs and production-associated risks, improving the system predictability, competitiveness, and resilience. Unfortunately, not all these practices have been fully adopted at a commercial level, mostly due to the lack of knowledge or logistics issues scaling them up into large operations. Aquaculture 342, 112–116. The contribution of flocculated material to shrimp (Litopenaeus vannamei) nutrition in a high-intensity, zero-exchange system. (2013). An extensive review done by Ulloa-Walker et al. The same with plants talking about ones that need CO2 to survive. However, conventional intensive farming practices with high water exchange rates can lead to disease outbreaks and crop losses (Thitamadee et al., 2016). doi: 10.1016/j.aquaeng.2018.03.003 CrossRef Full Text | Google Scholar Bauer, W., Prentice-Hernandez, C., Tesser, M. C., and Ray, A. World Aquac. Rev. Large commercial operations normally adopt conservative stocking densities, whereas small indoor “boutique farms” tend to stock with higher densities aiming to optimize resources/infrastructure (Figure 1). The use of different aerators on Litopenaeus vannamei biofloc culture system: effects on water quality, shrimp growth and biofloc composition. 1, 2–9. It is also easily understandable for all. As a result, several nursery facilities were abandoned, unsatisfactory growth performance was observed, and most farmers switched to “green water” earthen pond-based nurseries (Ching et al., 2020). N., Mouriño, J. C., De Lorenzo, M. doi: 10.1007/s10499-014-9819-x CrossRef Full Text | Google Scholar Holanda, M., Santana, G., Furtado, P., Rodrigues, R. J. doi: 10.1111/jwas.12718 CrossRef Full Text | Google Scholar Dobretsov, S., Teplitski, M., and Paul, V. O., Poersch, L. (2004) suggested that up to 29% of daily nitrogen retention of the shrimp was sourced by the natural biota (bioflocs). M., Martins, M. Google Scholar Badiola, M., Basurko, O., Piedrahita, R., Hundley, P., and Mendiola, D. doi: 10.1111/raq.12408 CrossRef Full Text | Google Scholar Wright, J. In this sense, the current trend suggests an increased demand for more “controlled intensive systems” with increased efficiency and biosecurity. Mini-review: quorum sensing in the marine environment and its relationship to biofouling. Stocking densities impact the shrimp harvest size (Krummenauer et al., 2011) and may influence the operational risks (e.g., disease outbreaks) and production costs. Similarly, water probiotics (Hostins et al., 2019), and feed additives such as organic acids (Da Silva et al., 2016), probiotics (Kesselring et al., 2019), prebiotics, and immunostimulants (Zhou et al., 2020) have been contributing to the improvement of shrimp health and diseases resistance. Figure 1. Acknowledgments We gratefully acknowledge the work of our numerous students, technical staff, industry collaborators, and colleagues who have contributed to the body of knowledge related to the biofloc technology in shrimp farming. S., Poersch, L. And it is all delivered in a hard to understand style. Moreover, the use of high-quality diets associated with automatic feeders (promoting better spatial and temporal feed distribution) has improved growth and uniformity. Superintensive culture of white shrimp, Litopenaeus vannamei, in a biofloc technology system in southern Brazil at different stocking densities. V., Sritunyalucksana, K., et al. 25, 147–162. Farm Design Lay-Out, 3. BFT in Shrimp Farming: Present In the past, BFT was mostly restricted to universities and research centres. Jr. (2011). doi: 10.1111/anu.13180 CrossRef Full Text | Google Scholar Zeng, S., Khoruamkid, S., Kongpakdee, W., Wei, D., Yu, L., Wang, H., et al. An example of a lack of training was the “brown water” nursery system in Ecuador. On the other hand, higher rates of BFT adoption (or similar microbial-based approaches) have been observed in Brazil, Peru, Guatemala, and Mexico, particularly during the nursery phase. doi: 10.1186/s13568-020-01119-y PubMed Abstract | CrossRef Full Text | Google Scholar Zhou, L., Li, H., Qin, J. 3D Design of the Sluice Gate, 4. J., Tierney, T. vannamei species in nursery, grow-out, and broodstock conditions. She also when listing shrimp she goes into some very expensive and hard to keep varieties. Glob. doi: 10.1590/rbz4720170060 CrossRef Full Text | Google Scholar Legarda, E. Some of the information is way to advanced for a beginner like the lighting section and the filtration section she goes into detail on foam filters, protein skimmers and things like that which are expensive and mainly used in saltwater tanks. Baton Rouge, Louisiana: The World Aquaculture Society. H., and Pearson, D. doi: 10.1016/j.aqrep.2020.100479 CrossRef Full Text | Google Scholar Hostins, B., Wasielesky, W., Decamp, O., Bossier, P., and De Schryver, P. doi: 10.1016/j.aquaculture.2019.734847 CrossRef Full Text | Google Scholar Biofloc technology still has a high production cost when compared to traditional (earthen pond) systems. Farm Costing Sheet, 5. In the future, scalability and incorporating circular economy concepts might help overcome some existing issues, reducing the carbon footprint and environmental impacts. A. Dietary prebiotic inulin benefits on growth performance, antioxidant capacity, immune response and intestinal microbiota in Pacific white shrimp (Litopenaeus vannamei) at low salinity. Managing input C/N ratio to reduce the risk of acute Hepatopancreatic Necrosis Disease (AHPND) outbreaks in biofloc systems–A laboratory study. A., Da Silva, A. Q. Nutr. 91:102120. doi: 10.1016/j.aquaculture.2019.04.055 CrossRef Full Text | Google Scholar Hussain, A. Several training courses were carried out, and the trained human resources from the 1990s and more recently from the 2000s, now spread globally, supported the BFT expansion and the implementation of various commercial operations worldwide (Ulloa-Walker et al., 2020). (2021). Conflict of Interest The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. That is to much for a beginner. Xu, W., Xu, Y., Su, H., Hu, X., Xu, Y., Li, Z., et al. In addition, more examples of industry-academia collaborations are needed and expected. In addition, information about the effect of bioflocs on shrimp quality is still scarce. Characterization of microbial communities in minimal-exchange, intensive aquaculture systems and the effects of suspended solids management. Tess rated it it was ok Dec 14, 2016 RZampich rated it did not like it Apr 07, 2016 Carly gaston rated it it was amazing Jan 26, 2017 Redeemed rated it it was ok Aug 23, 2020 Sschlesier rated it did not like it Jul 14, 2017 Kai Man Lee rated it really liked it Oct 18, 2021 Mark rated it it was ok Oct 30, 2017 Teresa Daniel rated it it was amazing Mar 18, 2020 Debbie Dudek rated it it was amazing Jan 10, 2020 Sheba Hall marked it as to-read Jun 22, 2016 Darlene marked it as to-read Aug 01, 2016 Lynne marked it as to-read Sep 30, 2016 brian reams is currently reading it Feb 17, 2017 Erin marked it as to-read Apr 03, 2017 Stan Czech is currently reading it Mar 20, 2018 Leo Hale marked it as to-read Apr 24, 2018 Tarrah is currently reading it Aug 08, 2018 Karla is currently reading it Aug 24, 2018 Iridius is currently reading it Jan 05, 2019 Sarah Kriegel is currently reading it Jan 18, 2019 Dwala Wishon is currently reading it Jan 28, 2019 Steven Nadan is currently reading it Mar 05, 2019 Leo is currently reading it Apr 27, 2019 Basics of Fish Farming for the Beginners describes the basics of designing and operating a small-scale fish farm. doi: 10.1111/j.1753-5131.2008.01002.x CrossRef Full Text | Google Scholar Susanti, L., Utomo, S. Nowadays, it has become consolidated as a production system in many countries. The biofouling process, the interaction between the microbes, the quorum sensing, and other communications processes are practical examples that must be better understood (Dobretsov et al., 2009). Jr. (2022). Dissimilarity of microbial diversity of pond water, shrimp intestine and sediment in Aquamimicry system. Likewise, new sensor technologies and data management & cloud systems coupled with machine learning, smart feeding technologies (e.g., hydroacoustic), and management decision support tools are examples of precision farming solutions that could contribute to a more functional BFT system (Rahman et al., 2021; Reis et al., 2022). C., Ramírez, N. W., Fisk, J. Nevertheless, adoption at scale and economics analysis will likely determine the feasibility of such technologies. 47, 612–623. S., Shoukry, N. It was later expanded to commercial shrimp farms in partnership with private sector companies from the U.S. In the 1990s and early-2000s, R&D efforts and commercial adoption began in the U.S. and Central America enabling further development of commercial large-scale shrimp operations, including Asia and Latin America (Burford et al., 2004; Ulloa-Walker et al., 2020). Pacific white shrimp and Nile tilapia integrated in a biofloc system under different fish-stocking densities. Seafood Alliance. Indeed, the screening of microbial profiles could be connected with management decision support tools and apps, and help to control better and manipulate these communities to achieve improved biofloc nutritional quality, pathogen control, and production outcomes. Photos of Major Aquaculture Species, 2. However, regardless of the system chosen and adopted, it is crucial to consider the local specificities (e.g., technological, social, financial, and environmental), tailoring day-to-day management practices and ongoing production strategies accordingly. The author describes three decades of practical experience in a scientific way. Aquaculture 546:737408. She often talks about reef tanks which has nothing to do with fresh water shrimp. 13, 676–705. F. Water Culture 4. In Asia, Vietnamese intensive farms seem to be very adaptable to new microbial-based protocols applied to nursery and grow-out phases (Arnold et al., 2020; Boaventura et al., 2020). H., Rosas, V. Seed Selection and Stocking 5. P., Bauman, R. Table 1. Aquaculture 546:737326. doi: 10.1111/raq.12494 CrossRef Full Text | Google Scholar FAO (2020). Aquaculture 465, 94–99. The increasing demand and shortage of resources, such as land and water, have pushed the industry toward intensifying shrimp farming (Xu et al., 2021). 50, 1123–1132. The effect of different alkalinity levels on Litopenaeus vannamei reared with biofloc technology (BFT). C., Gruber, C., Standen, B., and Wein, S. M., Santo, C. doi: 10.1016/j.aquaeng.2019.102040 CrossRef Full Text | Google Scholar Fleckenstein, L. In this sense, biotechnology tools and particularly the “omics” sciences will be required to identify and understand the microbial properties forming bioflocs, including the microbiota, mycobiota, and phytobiota. doi: 10.1016/S0044-8486(03)00541-6 CrossRef Full Text | Google Scholar Cardona, E., Lorgeoux, B., Chim, L., Goguenheim, J., Le Delliou, H., and Cahu, C. A., Sallam, W. Jr. (2020). K., Rosas, V. AMB Express 10, 1–11. D. Survival and growth of Litopenaeus vannamei reared in BFT system under different water depths. Aquaculture 518:734847. C., Vargas-Albores, F., and Martinez-Cordova, L. 23, 345–358. (2018). In large production areas (e.g., Asia and some Latin American countries), Biofloc Technology (BFT) became an alternative to overcome these issues, providing increased predictability and consistency (El-Sayed, 2021). The “brown water” refers to BFT heterotrophic-based (mostly using molasses and commercial probiotics to control ammonia) operated in small indoor lined concrete tanks. S., Mohammad, D. Effects of stocking density and artificial substrates on yield and water quality in a biofloc shrimp nursery culture. Eng. H., and Wasielesky, W. Under suitable conditions, BFT improves feed efficiency, stimulates growth, enhances the immune system (Hostins et al., 2019), and promotes a better physiological status compared to shrimp farmed in traditional systems (Cardona et al., 2016). Different scales currently utilized in commercial biofloc-based shrimp farming: large-scale farm in Vietnam, Asia (left); and small-scale “boutique close to market” farm in Brazil, Latin America (right). High-density shrimp producer wins innovation award. Characteristics of ammonia removal and nitrifying microbial communities in a hybrid biofloc-RAS for intensive Litopenaeus vannamei culture: a pilot-scale study. F., Martins, M. Aquaculture Res. An integrated framework of sensing, machine learning, and augmented reality for aquaculture prawn farm management. Asia Pac. E. 16:100257. doi: 10.1016/j.aquaeng.2020.102120 CrossRef Full Text | Google Scholar Furtado, P. AM-B, MM-P, MP, and FV: writing and review. Bras. C., Da Silva, D., Miranda, C. In 2018, the first-sale value of farmed crustaceans was 69,300 million USD, in which Penaeus (Litopenaeus) vannamei was the most cultivated species with an annual growth rate of 8.78% (FAO, 2020). As well the description of plants May 27, 2016 Victor rated it it was amazing Good infoGood information for aquarium lovers starting on caridin shrimp.Further study required for advanced aquarists, and for a better understanding of these curious little crustaceans. G. Q., et al. E., et al. Effects of culturing the Pacific white shrimp Penaeus vannamei in “biofloc” vs “synbiotic” systems on the growth and immune system. Jr. (2016). Y., Li, L., Qin, G. There are some spelling errors. K. Nowadays, after ~20 years of evolution, BFT has been adapted and adjusted to different regions, locations, salinities, applied to one single-phase (nursery) or multiple phases, outdoor and indoor conditions, and according to different farm infrastructure, operational and resources limitations. 81, 57–70. doi: 10.1111/are.13857 CrossRef Full Text | Google Scholar Poli, M. Int. S., Pereira, P. C., Cowley, J. “Sustainability and feasibility assessments of nanobubble aeration technology in economic-socio environment of Penaeus vannamei shrimp farming,” in BIO Web of Conferences: EDP Sciences (Yogyakarta). Disease Management 11. Aquariums, Aquariums Setup & maintenance) Jul 06, 2019 Carol Gibson rated it did not like it The problem with this book is the editing it is like english is not the author language. Sustainable shrimp farming in Bangladesh: a quest for an Integrated Coastal Zone Management. Use of biofloc technology in shrimp aquaculture: a comprehensive review, with emphasis on the last decade. From an educational perspective, the farm technicians are usually receptive to adopting new practices, but ongoing training and incorporation of specialized personnel are often required. Evidence of total suspended solids control by Mugil liza reared in an integrated system with pacific white shrimp Litopenaeus vannamei using biofloc technology. During this journey, a better understanding of the system, including engineering, roles of microbial communities, water quality, and feed management, has allowed for a more comprehensive and predictable environment (Table 1). P., Machado, C., Seiffert, W.

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