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Mitigating Leaching in Aquaculture Fish Feeds through Bio-Polymer Encapsulation

As part of Singapore's drive to enhance food security, there is now a greater push to increase the productivity of our local farms, and to be less reliant on imported food. As food fish is one of the key produce in Singapore, the Singapore Food Agency (SFA) has been implementing new initiatives that would boost sustainable food fish production locally, through innovative aquaculture farming. In aquaculture, while fish feed plays a crucial role in the health, growth and development of the fish, it also accounts for over 50-70% of the total production cost. To enhance productivity, one of the key strategies is to lower feed conversion ratio through the use of micronutrients-rich, leach-free fish feeds. Such fish feeds should provide the key amino acids required for the growth of the fish, while mitigating any loss of essential nutrients to the environment or through degradation. Currently, the stability of amino acids in commercial feeds has always been of concern due to the leaching and consequent dissolution of these nutritional agents into the aqueous environment. In this presentation, we will highlight how innovative encapsulation techniques can be exploited for the development of micronutrient-rich, leach-free, fish feeds with the aim of improving feed conversion ratios. This micronutrients-rich encapsulation technology aims to enhance productivity by lowering feed conversion ratio, while providing a good measure of cost savings for aquaculture applications.

Biography

Joachim Loo is Associate Professor in the School of Materials Science and Engineering (MSE), Nanyang Technological University (NTU), Singapore. He holds a joint appointment at the Singapore Centre on Environmental Life Sciences Engineering (SCELSE) and is a Visiting Scientist at the Harvard School of Public Health (HSPH), USA. He is also an international member of the Association of Pacific Rim Universities (APRU) for Sustainable Waste Management, and a member of the Coordinated Research Project (CRP) under the International Atomic Energy Agency (IAEA), United Nations (UN). His research interests include designing delivery systems for agri-food and biomedical applications. He has published more than 200 international journal papers (h-index: 53 – Web of Science), three book chapters and filed more than 15 patents. From his patented technologies, he has spun-off two companies, i.e. LiberaTx and Dietrics. Recently, he was also awarded a grant from the Bill and Melinda Gates Foundation to develop delivery systems for nutraceuticals. He is currently a co-convenor of the ISO/TC 229 Nanotechnology National Working Group (WG3), under the Singapore Chemical Industry Council.