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Perspective

Sustainable Utilization of Lactic Acid Bacteria in Aquaculture

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DESCRIPTION

The aquaculture industry is a crucial part of Malaysian fisheries and is important to the country's economy. There are significant problems with organic load, opportunistic organisms in aquaculture facilities, and mycotoxigenic fungus contaminating feed internationally. A biological way to maintain and restore the body's natural physiological condition and boost output is through lactic acid bacteria. Unfortunately, there has only been little research into the outcomes of inoculating macroalgae silage with lactic acid bacteria inoculants, and it has been done in a variety of experimental settings. The possibility for creating sustainable aquaculture by employing lactic acid-producing bacteria as just an inoculant for macroalgae silage. The outcomes in this region are subpar from a microbiological standpoint, and there is little information accessible. Macroalgae silage is a potential feed ingredient and is rising in favour as an alternative feed because of its substantial nutrient content. A natural antimicrobial source in aquaculture feed, seaweeds include useful metabolites such polyunsaturated fatty acids, carotene, phlorotannins, carrageenan, alginate colours, agar, and minerals. Increasing the use of efficient lactic acid-producing bacteria as an inoculums in aquafeeds can increase the aquacultural industry's productivity, safety, and environmental friendliness while also promoting the industry's long-term development [1].

In 2019, the fisheries industry's overall trade value was close to RM 8.0 billion, which went into the agriculture sector's Gross Domestic Product (GDP). Upgrading the nation's fish population from 1.9 million tonnes to 2.1 million is a goal of the Malaysia Plan. Comparing aquaculture to capture fisheries, a 50% increase in total fish production is anticipated by 2030. In addition to being the biggest consumers of healthy seaweeds, Asian nations are also the biggest producers, notably in terms of farming. In the Americas and Europe, kelp is the macroalgae species that is most frequently collected [2]. The estimated annual value of these crops' output on the global market at its peak, aquaculture in the world produced 122.6 million tonnes, with inland aquaculture producing around 54.4 million tonnes and coastal marine aquaculture producing 68.1 million tonnes. Although aquaculture no longer favours the high yearly growth rates, it still grows faster than some other primary food producers. From 2000 to 2016, the average annual growth rate fell to 5.8%; although, from 2006, to 2010, a small number of nations, particularly in Africa and Asia, saw double-digit growth [3].

The marine macroalgae known as seaweeds are found in coastal regions all over the world. They inhabit a variety of habitats and are available in a wide range of colours, forms, sizes, and compositions. Based on colour, red algae, brown algae, and green algae are the most prevalent types of seaweed. Seaweed is a good source of trace minerals like zinc, chrome, iron, selenium, copper, iodine, and cobalt and is rich in calcium, sodium, magnesium, magnesium, and phosphorus. The common name for these big marine algae is seaweed. In a natural setting, seaweed fragments are fastened to structural elements, and several are fastened to the ocean bottom over a root. In contrast, other species develop solitary water surfaces or float on multicellular colonies. Among marine species, kelp is among the richest providers of antioxidants and organic antibiotics. It was also regarded as a good source of minerals and the vitamins nicotinic, pantothenic acid, riboflavin, and folic acid. Many forms of algae with sufficient bioactivity have been found as acceptable for inclusion in meals for piglets, hens, laying hens, and rats as a result of ongoing study into sea resources. In order to lower the amount of antibiotics in animal feeding, alternative replacements are needed. As a result, we can take part in the search for a natural component that improves aquatic animals' access to nutrients while simultaneously treating or preventing disease [4,5].

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