

ANAEROBIC-AEROBIC HYBRID REACTOR INNOVATION FOR SOYBEAN INDUSTRIAL WASTEWATER TREATMENT

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ABSTRACT

In many developing countries, where protein sources from meat and milk are not always affordable for the public, food products made from soybeans play a very important role in people's diets because soy protein has almost the same quality as the quality of protein found in meat and dairy products. milk. The consequence of the development of the food industry made from soybeans is an increase in the volume of waste water produced. Wastewater from the food industry made from soybeans contains high levels of organic substances and chemicals that can pollute the environment if not treated properly. Therefore, processing waste from this industry is important to preserve the environment.

Anaerobic processing methods utilize microorganisms to decomposing organic substances contained in waste into methane gas and carbon dioxide. This process produces biogas which can be used as an alternative energy source and reduces greenhouse gas emissions. Apart from that, waste processing using anaerobic methods can also reduce operational costs and extend the service life of waste processing systems. In a global context, processing food industry waste made from soybeans using anaerobic methods can also support sustainable development goals, especially goal number 6 (clean water and good sanitation), goal number 7 (affordable and clean energy), goal number 11 (sustainable cities and communities), and goal number 13 (real action on climate change).

Although it has advantages, it results from anaerobic processing (especially for industrial wastewater treatment) is still relatively not in accordance with the provisions for being able to be discharged directly into water bodies. Therefore, innovation in processing methods is still needed so that the quality of the processed wastewater meets the requirements to be discharged directly into rivers. The processing innovation that will be developed in this research is microbubble-based aerobic processing, so the technological innovation developed in this research is called an anaerobic-aerobic hybrid reactor which can be applied in the soybean-based food industry on an MSME scale.

Kata Kunci: *Anaerobic-aerobic, soybean industry, sustainable development*