

## ABSTRACT

*Alternative energy sources for fossil-based energy substitutes are needed because fossil energy reserves are decreasing every day. One alternative technology that can be developed is Microbial Fuel Cell (MFC) which utilizes microorganisms to break down the substrate to produce electrical energy. Stale bread is chosen as a source of material to produce electricity because it is economical and can be found easily and abundantly in Indonesia. This research was conducted to investigate the existence of stale bread containing organic matter, this has great potential as a source of electrical energy using Microbial Fuel Cells. The reactor used is a dual-chambers MFC with each compartment having a dimension of 5 cm x 10 cm x 10 cm. In dual-chambers MFC systems, electrons are produced by bacteria from the substrate in the anode compartment and flow into the cathode electrons, while the protons are transferred to the cathode compartment via a salt bridge. Stale bread is used as a substrate at the anode, distilled water on the cathode, and a salt bridge (1 M NaCl) as a proton transfer medium. Variation in substrate incubation time is 1 day , 2 day and 3 day. The results showed that the longest spoilage of bread can produce the highest production of electrical energy with a voltage of 0,03669 volts, current strength of 0,33 milliamperes, power density of 0,050 mW.m<sup>-2</sup> and energy of 12,56989 kilojoules.*

*Keywords: Microbial Fuel Cell, stale bread, electrode*