Investigation of the relationship between microorganism growth and electrical conductivity of cut fo

翁偉喬、王維麒

E-mail: 345345@mail.dyu.edu.tw

ABSTRACT

Microorganisms usually cause cut-foods to spoil, and decrease the quality; however, traditional microbiological tests are not able to instantly provide the quality information of food materials. The purpose of this study is to test the electrical conductivity of cut-foods material under different storage conditions, and by conducting the microbiology experiments, further to examine the relationships between the electrical conductivity during the storage period and microorganism growth. A four-point probe in a hammer-shape was used in the study, embedded with four titanium symmetric electrode probes (length of 10mm, intervals of 10mm). The two outer probes were connected to the power supply unit to measure the electric current, and the other two inner probes measured voltage difference. The probe tipped the surface of samples and 15V, 60HZ alternating current was supplied, at the condition of no heating. Meat samples were preserved for 72 hours, and measured in every 12 hours; fruit samples were preserved for 120 hours, and measured in every 24 hours. The electrical conductivity of both kinds of samples was determined by the connecting data recorder and computer. Meanwhile, the microorganism experiment was conducted for all samples, and interrelations between conductivity and microorganism growth were analyzed by using regression. The results showed that under long-term storage condition, the total plate count of cut-foods materials exponentially increased with time, and particularly, the growth rate was found higher under humid condition. The electrical conductivity had similar tendency but different style. The non-lineary regression result indicated the electrical conductivity was positively related to the microorganism of total plate count, which means the electrical conductivity has the potential to be applied as an indicator of instant cut-foods quality.

Keywords : electrical conductivity、total plate count

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