

TITLE: USE OF THE FLUORESCENCE SPECTROSCOPY TECHNIQUE AS A COMPLEMENTARY ANALYSIS IN THE MICROBIAL GROWTH PROFILE STUDY IN HAM

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ABSTRACT:

Fluorescence is an optical phenomenon that happens in a molecule after the incidence of light. Known as "molecular signature", the use of fluorescence spectroscopy has been used to identify isolated microorganisms and to determine microbial deterioration in meat. In this aspect, fluorescence spectroscopy is shown as a fast, efficient and technically simple method in relation to the slow and laborious procedures for the use of the Standard Counting Plate (CPP) technique. In this experiment the tests were done with the purpose of obtaining the characteristic fluorescence spectra of the ham and to recognize the growth process of the microorganisms and/or to detect microbiological changes in this food. Finding, therefore, a relation between this technique and CPP. The methodology used to trace the microbial growth profile in the food was the CPP and, as a complement, analyzes were made with the fluorescence spectroscopy technique. The fluorescence measurements were carried out on the samples of ham at the same times considered for the microbiological analyzes, being 12 times in total. To perform these tests, a portable spectrofluorimeter equipped with a Y optical fiber, a diode laser at 405 nm and a monochromator was used. To standardize the excitation and acquisition of the experimental data, fluorescence measurements were performed with the ham sample positioned at a distance of approximately 1cm from the optical fiber. A fluorescence study of two species of bacteria: *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 27664, was also carried out in order to identify the origin of the fluorescence peaks found in the ham study. By comparing the results of analyzes of the ham samples with the spectra presented in the isolated bacteria it is possible to say that probably the peaks between 600 and 700 nm observed in the fluorescence of the ham are due to the bacteria present in it. In addition, the technique was able to identify differences between the ham samples, demonstrating sensitivity to microbial growth. Therefore, the fluorescence spectroscopy technique was able to determine the presence of microorganisms in the ham, and other studies are still necessary to obtain more conclusive information, which indicates that this technique can be a complementary tool in the control food microbiology.

Keywords: fluorescence spectroscopy, control food microbiology, microbial growth profile

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