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Applications of spectrofotometric methods as rapid tools in food technology and food microbiology

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Rapid methods to determine spoilage of particular foods or identify the defects associated with the production and processing of a specific food are needed in food industry. Biochemical changes within the food substrate due to microbial activity can be monitored and thus predict the shelf life of a product using spectroscopic methods. Furthermore, the detection and identification of both pathogenic and spoilage bacteria together with sources of contamination is possible. Conventional methods can be used for the detection of spoilage of food and identification of bacteria. However, conventional biochemical and microbiological methods are time consuming. Fourier Transform Infrared Spectroscopy (FT-IR) and Raman micro spectroscopy are two methods for application in this purposes as a rapid methods. The chemical bonds in the molecules have specific frequencies at which they vibrate, corresponding to energy levels . A beam of infrared light passes through the sample and the absorbed energy at each wavelength is recorded. Since molecular bonds directly affect the vibrational spectra and give specific fingerprints that can be used to characterize materials. Vibrational spectroscopy methods have considerable interest recently and reports of applications in food industry have been increasing. Various applications are listed; for microbial spoilage of meat; quality control of meat such as beef, pork and chicken; for online detection of freezee-thawed fish from fresh fish samples, bacterial counts of milk during storage; classification and rapid detection of foodborne pathogens. In this presentation the theory of vibrational spectroscopy methods such as FT-IR and Raman; various applications of food microbiology and food industry and finally results obtained the studies in our lab will be discussed.

Biography

Dilek Heperkan has completed her PhD in 1986 from Egean University, Turkey. She worked as a Researcher for 10 years in TUBITAK, National Scientific and Research Institute. She participated as a member of World Working Party of Mycotoxin (2002-2007). She worked as a Visiting Scientist in countries such as Belgium, Germany, Netherland and United Kingdom. She also worked for sabbatical in the USA in 2001. She also visited Universite de Vigo, Spain and gave lectures by Erasmus Programme in 2007. She organized a number of national and international meetings. Recently, she organized 23rd International Food Micro 2012 Congress together with ICFMH. She is currently working as a full time Professor in Istanbul Technical University, Food Engineering Department.

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