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APLICAÇÃO DA CALORIMETRIA EM MICROBIOLOGIA DE ALIMENTOS

APPLICATION OF CALORIMETRY IN FOOD MICROBIOLOGY

Isothermal microcalorimetry has been used in medicine and biological areas, for approximately 15 years, for the detection and characterization of pathogens, drug testing, parasitology, tissue engineering, geomicrobiology and soil science. Microcalorimetric data can be instantly converted into biologically significant parameters, such as growth rate, latency phase or maximum growth of microorganisms, providing real-time information. Technological advances of calorimeters allowed to monitoring bacterial activity and growth or death of the culture in several samples, from soil until liquid cultures. As microbial growth occurs, the typical heat flux curve results in increased or decreased heat flux measured in the calorimeter. It is appropriate to combine microcalorimetry with others analysis, such as HPLC, evaluation of physical-chemical parameters (such as water activity and pH) and direct or indirect cell counting techniques. Extracting broader data for microbiological studies in the food industry would allow the choice of the best mathematical models to estimate biological parameters using calorimetric data. The main advantages of applying microcalorimetry in food microbiology are the short time for analysis, providing real-time results, besides requiring small amounts of samples and to be suitable for different scenarios, like biofilm formation, oscillations and metabolic transition of microorganisms.

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