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Synthesis of prebiotics as monitor by infrared spectroscopy

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Fructo-oligosaccharides (FOS) are well recognized prebiotics, that is, non-digestible food components that beneficially affect the host health by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon. From a chemical point of view, FOS are composed of fructose units linked by (2 \rightarrow 1)- β -glycosidic bonds and a single D-glucosyl unit at the non-reducing end of the chain. In most cases, FOS are mixtures of oligosaccharides with degree of polymerization from 3 to 6. As the composition of FOS is determined by the synthesis conditions, the goals of this work were: a) to engineer FOS of different composition by adjusting the sucrose concentration used as initial substrate; b) to define partial least square (PLS) based-models to quantify all the sugars present in the reaction medium directly from the FTIR spectra. The progress of the reactions was followed by HPLC. The yield of each reaction was calculated as the percentage of initial sucrose converted to each oligosaccharide. In parallel, the reactions were monitored by FTIR. Six different PLS models aiming at determining the concentration of each carbohydrate present in the reaction medium were calibrated and independently validated. The means of predicted values fitted nicely those obtained by HPLC. Determining FOS composition directly from the FTIR spectra enables obtaining reliable information with strong impact at both academy and industrial level.

Biography

Andrea Gomez-Zavaglia has completed his PhD in 2000 at the National University of La Plata (Argentina) and Post-doctoral studies at the University of Coimbra (Portugal) and Max Planck Institute (Germany). She became a member of the Research Career from the Argentinean Research Council (CONICET) in 2004, and then became the leader of the group "Spectroscopic Methods in Food Microbiology" at the Center for Research and Development in Food Cryotechnology (CIDCA, Argentina). She has published more than 110 papers in reputed journals and has been serving as editor or as an Editorial Board Member of different reputed journals. She has been a Visiting Professor at the Universities of Vigo, Autonomous of Madrid (Spain), and Paris 7 (France) and has consolidated collaborations with international reputed groups and enterprises from Portugal, France, Italy, Spain, Germany, Poland, Brazil, Uruguay, Chile, Peru, Mexico and Argentina.

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