



# Study of Melanoidins of the Maillard Reaction in Dulce de Leche <sup>†</sup>

The “Dulce de leche” (DL) is a dairy product elaborated by milk and sucrose concentrated in favorable conditions for the Maillard Reaction (MR). This reaction develops organoleptics properties, like aroma and color. The MR is a type of non-enzymatic browning which involves the reaction of carbonyl compounds, especially reducing sugars with compounds that possess a free amino group such as amino acids, amines and proteins. The final stage of the chemical reaction is typified by the production of brown and nitrogen-containing polymers and co-polymers, the melanoidins. Recently research relate these products with antioxidant, antimicrobial, anti-inflammatory, antihypertensive or prebiotic activity. In foods melanoidins are linked to proteins in a complex structure as melanoproteins which are more difficult to analyze so it is relevant the melanoidins separation and isolation from a complex matrix.

The aim of this work is the separation, isolation and structural elucidation of melanoidins from DL.

DL was elaborated in the laboratory with skim milk and sucrose, with an initial pH of 7,6. Firstly, separate with dialysis and centrifugation to obtain melanoproteins. Moreover, the insoluble and colored fraction was digested by pronase enzyme. Next, the digested enzymatic product was fractionated by gel filtration (cut-off 1,8 kDa). Finally, the melanoidins were separated from the colored fractions of gel filtration by SPE using a C18 cartridge with different mixtures of methanol and water. The colored fractions obtained were monitored by TLC and analyzed by mass spectrometry.

TLC shows compounds that reveal with ninhydrin and orcinol. In addition, some compounds were fluorescent (detection at 365 nm), in agreement with reported compounds obtained in models of the MR. Mass spectrometry analysis shows a complex mixture of compounds with  $m/z$  less than 1200 and with some structural motifs that could correspond to melanoidins. More studies are needed to determine the structure of these compounds.