2. Abstract

Currently, the reformulation of chocolates and confectionery products seeks to find novel alternatives to cocoa butter (CB) which are cheaper and adhere to the nutritional recommendations of reducing the amount of saturated fat and increasing the unsaturated one. For this purpose, this TFM proposes to elaborate chocolates by replacing the CB with an oleogel (OG) which is formulated with hydroxypropyl methylcellulose (HPMC) as a structuring agent for high oleic sunflower oil (HOSO), using the indirect method "*foam-templated approach*". Initially, with the OG elaborated, CB/OG systems were designed and characterized as substitutes for CB, with four replacement levels (30, 50, 70 and 100%), and designated according to the CB/OG ratio as 70/30, 50/50, 30/70 and 0/100 systems, as control CB (100/0). Subsequently, homologous chocolates were formulated, characterized and evaluated with these systems (B-100/0, B-70/30-Ch, B-50/50, B-30/70 and B-0/100). In both preparations, CB/OG systems and B-CB/OG, dynamic and stationary rheological properties, hardness, thermal properties, microstructure, and oil-binding capacity were determined. Additionally, in the chocolates the lipid profile and color were analyzed, and a sensory analysis was carried out. All CB/OG systems and B-CB/OG showed elastic-gel behavior, although only 100/0 and B-100/0, B-70/30 and B-50/50 could be classified as strong gels. The increase in the proportion of OG in the CB/OG system, weakens the rigidity and resistance of the network of fat crystals conferred by the CB, and decreases both its viscoelasticity and thermal properties, although the differences between the properties of the homologous chocolates were diminished because of the ingredients presented in the chocolate food matrix (sugar, cocoa powder, milk powder and lecithin). The sensory analysis shows that it would be possible to replace up to 70% of the CB by the OG in chocolate formulation, although from a technological point of view a replacement of 50% seems more appropriate. However, both percentages of substitution imply a significant improvement in the lipid profile based on a reduction in saturated fat of 55 and 37%, respectively, doubling the amount of unsaturated fatty acids in case of replacing 70% of CB by the OG.

Keywords: oleogel, *foam-templated approach*, hydroxypropyl methylcellulose, cocoa butter, chocolate, rheology, lipid profile, sensory analysis.