APPLICATION OF LOW TRANS FAT SOY-BASED FATS DEVELOPED USING AN ARTIFICIAL NEURAL NETWORK (ANN) IN SEMI-SWEET BISCUITS

Alessandra Penteado, Daniel Barrera-Arellano, Caroline Joy Steel. School of Food Engineering, University of Campinas (UNICAMP), Rua Monteiro Lobato 80, 13083-862, Campinas, SP, Brazil

Concerns related to the health hazards caused by trans fat intake and Brazilian regulation enforcing the declaration of trans fat levels in processed foods has made industry rapidly find alternatives. However, most of them are of higher costs than the formerly used partially hydrogenated vegetable fats. The aim of this study was to apply Artificial Neural Network (ANN) technology to obtain low trans fat blends derived from soybean and to evaluate their performance when applied in the processing of semi-sweet biscuits. Two different interesterified soy fat bases and soybean oil were used. To define the blends, the parameters used were the melting point and the solid fat content of a low trans commercial fat available in the market (containing palm oil). Four blends were selected according to the lowest error. Differences in machinability of the biscuit dough were evaluated as well as the physicochemical characteristics of the final product (volume, density, expansion, horizontal and vertical growth, color, hardness, water activity and moisture). The biscuits produced with the fat blends selected using the ANN, compared with the biscuits made with the commercial low trans fat, showed no significant changes in process/machinability parameters and physicochemical analysis of the final product. Thus, this study suggests that using ANN it was possible to develop low trans fats derived from soybean for use in biscuits optimizing formulation time and using raw materials available in Brazil at a lower cost. These blends also contained lower saturated fat content than the current commercial fats.