Storage stability of margarines produced from enzymatically interesterified fats compared to those prepared by conventional methods - Chemical properties

In this study, four margarine hardstocks were produced, two from enzymatically interesterified fats at 80 and 100% conversion, one from chemically randomized fat and one from physically mixed fat. These four hardstocks, blended with 50% sunflower oil, were mainly used for the production of table margarines in a pilot plant. Storage stability studies were carried out at storage temperatures of 5 and 25°C for 12wk. Margarines from the enzymatically interesterified fats were compared to the margarines produced by the conventional methods (chemical interesterification and physical blending) and to selected commercial margarines. The changes in the chemical properties of the products, including peroxide values (PV), tocopherols, free fatty acids, volatile oxidation products, and sensory evaluation, were examined during storage. It was observed that the margarine produced from the chemically interesterified fat had higher PV in weeks 4, 8, and 10 than the margarines produced from the enzymatically interesterified fats and the physically blended fat. These differences were not caused by different contents of tocopherols in the hardstocks. The differences between the processes for chemical and enzymatic interesterification, including further treatment stages, might be responsible for the development of a high PV in the margarine produced from the chemically interesterified fat. However, the contents of volatiles did not show the same tendency as observed for PV for the margarines stored at 25°C during 12wk. Storage at 25°C accelerated oxidation compared to storage at 5°C. The content of α- and γ-tocopherols decreased faster than the content of β- and unknown-tocopherols during storage. This phenomenon was only affected by storage time, not by storage temperature. Sensory analysis did not show consistent differences between the produced margarines and commercial margarines, and no hydrolysis occurred for these four margarines during storage. The margarines produced from the enzymatically interesterified fats had low PV and a similar taste and smell compared to the margarine produced from the chemically interesterified fat.