PHYSICO-CHEMICAL PROPERTIES OF VEGETABLE OILS FROM LOCAL TRADE

Svetlana HARITONOV, Angela GUREV, Veronica DRAGANCEA

Technical University of Moldova, Chisinau, ***Moldova***

Health and nutrition are interdependent categories of vital importance. The availability of harmless and healthy food is one of the inseparable conditions of health care and promotion.

Natural oils have a complex of oily substances extracted by various methods from plants, fruits or seeds without being mixed with products from chemical synthesis. The physico-chemical properties of lipids, which have a special importance in food technology, are determined by their chemical composition and structure, which can be determined by establishing indices of normal chemical composition (iodine index, saponification index) or freshness indicators (acidity index, peroxide index, p-anisidine index).

In the paper are applied a series of chemical and physico-chemical methods for the analysis of commercially oils, with different origins and manufacturing methods. The analyzed oils were mixtures, derived from different oil plants: sunflower, grape seeds, olives, corn germ, pumpkin seeds, flax.

The quality indices of the oil samples were determined by various processes: the acidity (% oleic acid), the saponification index (mg sodium oleate / kg), the iodine index, the peroxide index (meq O_2/kg), the p-anisidine index and the diene content, and conjugated triene.

The experimental study aimed to research oxidative degradation of oils over time, determining by the spectrophotometric method the content of primary and secondary oxidation products. The peroxide (meq O_2/kg) and p-anisidine indices were determined by the spectrophotometric method of iron (III) thiocyanate. For some oils (unrefined sunflower oil, flax, pumpkin seeds) peroxide indices have very low values (0.247 ± 0.02) and their evolution over time is not essential. This indicates that, during the storage of oils, there is a slight accumulation of lipid peroxidation products. A small amount of oxidation by-products (p-anisidine index, 0.037 ± 0.05) is recorded in the mentioned oil samples, which may explain the low values of the peroxide indices.

In contrast, for olive, corn germ and grape seed oils, there are high values of the content of primary and secondary oxidation products compared to the standard of samples, which also have increased during storage. There was a small decrease in the peroxide index during storage due to the increase in the p-anisidine index (1,673 ± 0.06), ie by the accumulation of oxidation by-products obtained by the decomposition of hydroperoxides.

The oils analyzed by the unrefined sunflower, flax, from pumpkin seeds are fresh, but they cannot be kept for a long time. For olive oil the peroxide index exceeds 16 meq O_2 /kg, for corn germ and grape seed exceeds 12 meq O_2/kg. Therefore, these marketed oils already contain primary and secondary oxidation products, ie they show a slight oxidative deterioration.

The difference between the quality indices of the analyzed vegetable oils can be explained by the difference between the production processes (temperature, subsequent purification) and the storage conditions.