

## STUDY OF THE CONTENT OF FAT-SOLUBLE VITAMINS IN THE COMPOSITION OF UNREFINED VEGETABLE OIL

*Kunik A.N., Saribekova D.G., Chabanova N.R.*  
Kherson national technical university, Kherson, Ukraine  
[kulish.aleksa@gmail.com](mailto:kulish.aleksa@gmail.com)

The human immune system protects the body from the effects of external adverse factors. It is a kind of «line of defense» against the aggressive action of bacteria, fungi, viruses, etc. Without a healthy and effectively functioning immune system, the body weakens and suffers from various infections. Vitamins are needed for the formation of immune cells, antibodies and signaling substances. The daily requirement of vitamins is insignificant, but the normal work of the immune system and normal energy metabolism depend on them.

The human body is unable to synthesize vitamins on its own and is forced to use their finished forms or their precursors with food, biochemically converting the latter into vitamins. The only vitamin that a person can synthesize on their own is vitamin D.

Vegetable oil is an important part of the human diet. The chemical composition of vegetable oil, as an object modeled by nature, is unique. Of the four fat-soluble vitamins A, D, E, and K, vegetable oils contain only three. In descending order of concentration: E, A and K.

The aim of the work was to study the content of fat-soluble vitamins in unrefined vegetable oil.

Samples of unrefined vegetable oils from non-traditional raw materials were selected as objects of research: flax, hemp, mustard, pumpkin, camelina, obtained by cold pressing, Ukrainian production, supplier Leko Style, Kyiv. Sunflower vegetable oil was studied to obtain a comparative characteristic.

To determine vitamin A, a method based on saponification of vegetable oil lipids, isolation of unsaponifiable matter containing vitamin A, colorimetric reaction of chloroform solution of unsaponifiable substances with antimony trichloride and measurement of optical density of the obtained solution at a wavelength of 620 nm was used.

The mass fraction of vitamin E was found by thin layer chromatography, using ethyl ether and hexane (1: 1) as eluent. Unsaponified substances were isolated by exhaustive extraction with ethyl ether. The results obtained are presented in Table 1.

Table 1. The content of fat-soluble vitamins in samples of unrefined vegetable oil

Indicator, units of measurement	Oil					
	sunflower	flax	hemp	mustard	pumpkin	camelina
Mass fraction of vitamin E, mg%	115,0	48,0	56,0	50,0	40,0	40,0
Mass fraction of vitamin A, IU	2,5	1,8	3,5	62,9	39,9	31,8

The obtained data show that sunflower oil has the largest mass fraction of vitamin E – 115.0 mg%, almost 2 times less vitamin E contain hemp, mustard and linseed oils – 48.0 – 56.0 mg%. The content of vitamin E in pumpkin and rye oils is 40.0 mg%. Mustard oil has the highest content of vitamin A – 62.9 IU, pumpkin and camelina oil also have a high content – 31.8 – 39.9 IU. Hemp, sunflower and flaxseed oils contain the lowest mass fraction of vitamin A – 1.8 – 3.5 IU.

The data obtained can be used to calculate the daily requirement of vitamins, as well as to predict the shelf life of unrefined vegetable oils, as vitamins E and A are natural antioxidants.