

STUDY OF THE ROLE OF VITAMIN A IN THE FORTIFICATION OF EDIBLE OIL

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The nutritional value of fat depends on its fatty acid composition as well as on the content of various additives (vitamins, phosphatides, etc.). Vitamin A is well preserved and utilized by the body only when dissolved in fats. This vitamin plays an important role in metabolism and especially in the vital activity of the growing organism. Considering these features of fat processing, the study examined the degree of vitamin A retention in fortified cottonseed oil and the effect of food-grade phosphatides on it. Phosphatides are biologically active substances and at the same time act as natural antioxidants, stabilizers, and emulsifiers.

Butter and ghee, which naturally contain vitamin A, were taken as control fats. For fortification, refined edible cottonseed oil obtained by pressing and free from phosphatides was used. A vitamin A concentrate served as the source of the vitamin. The cottonseed oil was fortified with this concentrate at levels of 26, 43, 46, and 92 IU of vitamin A per gram of fat.

Samples of oil containing 26, 43, and 46 IU of vitamin A had similar organoleptic characteristics (color, smell, taste) typical of cottonseed oil, with a barely perceptible taste of the vitamin concentrate. When vitamin A was added at 92 IU per gram, only a slight flavor and aroma of the vitamin concentrate were noted. When phosphatides were added to the fortified oil samples at levels of 0.7% and 1%, a slight sunflower oil taste appeared, but the overall flavor and smell characteristic of cottonseed oil were preserved.

All samples of fortified oil underwent thermal processing commonly used in cooking, i.e., heating up to 160°C, “slight roasting” up to 200°C, and “deep roasting” up to 240°C. The “slightly roasted” and “deep roasted” samples acquired pleasant organoleptic properties, the taste of the vitamin A concentrate disappeared, while that of the phosphatide concentrate remained as minor traces.

The results of the study confirmed the possibility of fortifying cottonseed oil with vitamin A in combination with food-grade phosphatides, which act as natural antioxidants. The stability of vitamin A is increased to some extent by introducing phosphatides as a stabilizer into the fat. This improved retention may also be explained by the high content of the antioxidant tocopherol in this oil (from 86 to 110 mg%). Furthermore, vegetable phosphatides possess a range of beneficial properties, one of which is delaying fat oxidation.

Thus, the presence of certain amounts of phosphatides in cottonseed oil contributes to preserving the added vitamin A during thermal processing of the oil.

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