

Walnut Kernel Processing using Supercritical CO₂ Extraction

Jenac A., Caragia V., Botnari O., Migalatiev O.,

Practical Scientific Institute of Horticulture and Food Technology

Chisinau, Republic of Moldova

Presently, a great attention is paid to the new technologies that permit to obtain natural biologically active compounds. One of these is the supercritical extraction with carbon dioxide. The advantages of this method of extraction with CO₂ as solvent: it is non-toxic, volatile, easy to recover, with high diffusion rates, good mass transfer and low cost.

A rich source of biologically active compounds is walnut kernel having medicinal properties that are known for centuries. Walnut kernels contain functional food ingredients: proteins, polyunsaturated fatty acids (PUFA), dietary fiber, minerals and vitamins.

In this context, we have been studied the CO₂ extraction technology of walnut kernels (*Schinoasa* variety). It was studied the parameters of extraction process (particle size, pressure, temperature and time). It was established the fatty acids content of the walnut CO₂ extract and its stability during storage for two months.

The major unsaturated fatty acids of walnut CO₂ extract are: linoleic – 62.47% (ω-6), linolenic – 9.97% (ω-3) and oleic - 16.48%. According to nutritionists, the ratio of ω-3/ω-6 is very important that should be about 1:5. In walnut CO₂ extract this ratio is 1:5.7 that confirms that the content of PUFA is well-balanced in walnut extract. It was found that in two months of storage the peroxide value increased from 3.3 to 3.5 ½ O mmol/kg in the walnut CO₂ extract whereas in the cold-pressed oil it increased from 2.4 to 3.0 ½ O mmol/kg).