

Characteristics and Analysis of Bioactive Compounds in Rapeseed and its Products

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Rapeseed is the most important source of vegetable oil in Europe and the second most important oilseed crop in the world after soybean. Worldwide production of rapeseed is growing rapidly to 59.1 million tons in 2011, of which the total European Union (EU) production accounts for 18.8 million tons. The Food and Agriculture Policy Research Institute (FAPRI) forecasts that the world production of rapeseed will increase to 61.7 million tons in 2017/2018. Obviously, rapeseed oil production in the world and EU is steadily increasing. Cold pressed and refined rapeseed oils are frequently used in Eastern and Northern Europe for consumption, cooking and as ingredient in food products. Rapeseed and its products are rich sources of natural components having antioxidant properties. Rapeseed cultivars, meal and rapeseed oil contain bioactive components such as: vitamin E, phenolic compounds, flavonoids, phytosterols, phospholipids, and other antioxidant species, which may imposed positive health effects. These bioactive compounds are important in the prevention and treatment of some worldwide health related problems such as: heart diseases, neurodegenerative diseases, autism, cancer, stroke, diabetes, Alzheimer's dementia, Parkinson's disease and rheumatoid arthritis.

The most common method of tocopherols, phytosterols, phospholipids, phenolic compounds and other antioxidants analyses in rapeseed and its products is chromatography, which provides more specific and selective assays than spectroscopic techniques. However, different spectrophotometric single electron transfer-based (2,2'-diphenyl-1-picrylhydrazyl – DPPH, 2,2'-azinobis(3-ethylbenzothiazoline-6-sulphonic acid) – ABTS radical cation assay, cupric reducing antioxidant capacity – CUPRAC, ferric reducing antioxidant power – FRAP, reducing power - RP) and hydrogen atom transfer-based (oxygen radical absorbance capacity– ORAC, α -carotene–linoleic acid) methods were often used for determination of total antioxidant capacity of rapeseed varieties, meals and oils. Improvement of antioxidant determination resulting in development of new rapeseed based products, which can be used in the functional food production and nutraceutical industry.