

Camelina Oil from Austrian Seeds is Rich in Alpha-Linolenic Acid and Free of Cholesterol

Gert M.Kostner¹⁾, Günther Fauler²⁾ and Birgit Birnstingl-Gottinger³⁾

¹⁾ Institute of Molecular Biology and Biochemistry ²⁾ Clinical Institute of Medical and Chemical Laboratory Diagnostics, both Medical University of Graz, Austria ³⁾ Arge Kreislaufwirtschaften mit Mischkulturen, A-8151 Hitzendorf, Austria

Oil from *Camelina sativa* (camelina oil) is one of the richest oils in alpha-linolenic acid. Alpha-linolenic acid serves as a precursor of very long-chain polyunsaturated fatty acids and gives rise to the biosynthesis of EPA and DHA in animals and men. Yet alpha-linolenic acid by itself exerts numerous beneficial effects such as lowering plasma LDL-cholesterol and triglycerides. Epidemiological studies also revealed that elevated alpha-linolenic acid in body stores are associated with a decreased risk of breast cancer development and with a better survival. Omega-3 fatty acid rich diets are also recommended for primary and secondary prevention of cardiovascular diseases. Camelina oil is not only very rich in omega-3 fatty acids but also in alpha and gamma tocopherol, which protects from auto-oxidation and free radical formation. In addition, camelina oil is rich in plant sterols, which are known to interfere with cholesterol absorption, and thus nowadays numerous nutrients are enriched with these sterols. There are however rumors alleging that camelina oil may also contain cholesterol. We therefore analyzed camelina oil derived from organic agricultures of Austrian farmers. A representative sample harvested in July 2008 was analyzed by GC-MS. The main fatty acids of camelina oil were alpha-linolenic acid (32%), linolenic acid (19%), oleic acid (16%), and gadoleinic acid (C20:1; 13%). The omega-3/omega-6 ratio in the oil was 1.6. In addition, the camelina oil contained 8.6 mg/ml of plant sterols with campesterol and sitosterol as major and brassicasterol and stigmasterol as minor components. Also a yet unidentified sterol, which is currently analyzed, was found. However, the analyzed product was definitely free of cholesterol. In summary we conclude that camelina oil from Austrian crops is an alternative source of omega-3 fatty acids with many desired properties concerning composition such as omega-3/omega-6 fatty acid ratio, plant sterol, and anti-oxidant content which is absolutely free of heavy metals and finally of good taste. This makes it an ideal nutrient in preventive and alternative medicine.