

Nutritional Profile and Benefits of Hemp Seed, Nut and Oil

by Gero Leson

Hemp foods are expanding onto the shelves of grocery and natural food stores across North America. By definition, these are foods containing whole hemp seeds or the oil, nut (hulled seed) and/or flour (ground seed cake) derived from the seeds.

Examples of currently available hemp food products include salad dressings, nutrition bars, breads, cookies, granola, waffles, nut butter, chips, pasta, frozen deserts and cold-pressed oil supplements. These products are sold for much more than their "hemp cachet" alone; manufacturers promote hemp foods for their exceptional nutritional and taste benefits. Examining the composition of hemp seed will help explain these benefits.

Like other oil seeds, the hemp nut consists mainly of oil (typically 44%), protein (33%) and dietary fiber and other carbohydrates (12%, predominantly from residues of the hull). In addition, the nut contains vitamins (particularly the tocopherols and tocotrienols of the Vitamin E complex), phytosterols and trace minerals. Overall, hemp's main nutritional advantage over other seeds lies in the composition of its oil, i.e. its fatty acid profile, and in its protein which contains all of the essential amino acids in nutritionally significant amounts and in a desirable ratio.

Most oil seeds contain plenty of linoleic acid (LA), an essential fatty acid (EFA) from the "omega-6" family, yet they offer little alpha-linolenic acid (ALA), the other EFA from the "omega-3" family. Health agencies around the world agree that humans should ingest these EFAs in an omega-6/omega-3 ratio of about 4:1. Since common seed oil and animal fat, both low in omega-3, account for most of our fat intake, Western diets typically have omega-6/omega-3 ratios of 10:1 or more, which is far too rich in omega-6 and correspondingly too deficient in omega-3. Recent clinical research continues to identify this imbalance as a co-factor in a wide range of common illnesses, including cardiovascular diseases, arthritis, diabetes, skin and mood disorders. A 1999 workshop by the U.S.

National Institute of Health (see http://ods.od.nih.gov/news/conferences/w6w3_abstracts.html) demonstrated the impressive benefits of a balanced omega-6/omega-3 ratio in our diet: reduced risk of atherosclerosis, sudden cardiac death and certain types of cancers, decrease in the symptoms of rheumatoid arthritis, mood improvement in bipolar disorders and optimized development in infants.

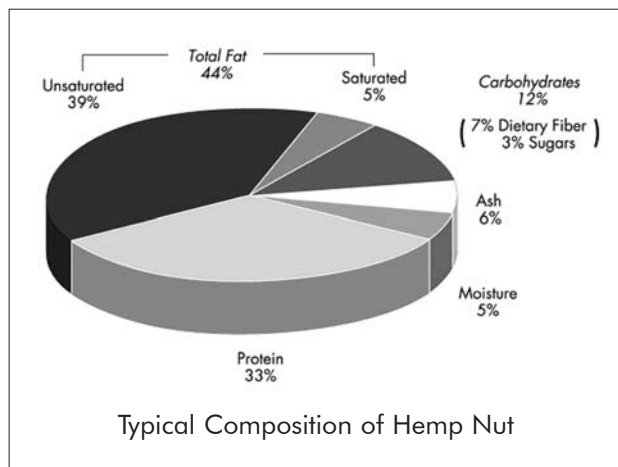
In clinical studies, these benefits are often achieved using omega-3-rich fish and flax oil supplements. A more "holistic" approach consists of shifting our general dietary fat intake towards nuts and oils offering a better

omega-6/omega-3 ratio. Hemp nut and oil offer an omega-6/omega-3 ratio of 3:1 or less, depending on plant variety. This exceeds the target ratio of 4:1 and compensates in part for omega-3 deficiencies in the rest of our diet. No other vegetable oil offers EFAs at such high concentrations and, more importantly, in such a desirable omega-6/omega-3 ratio.

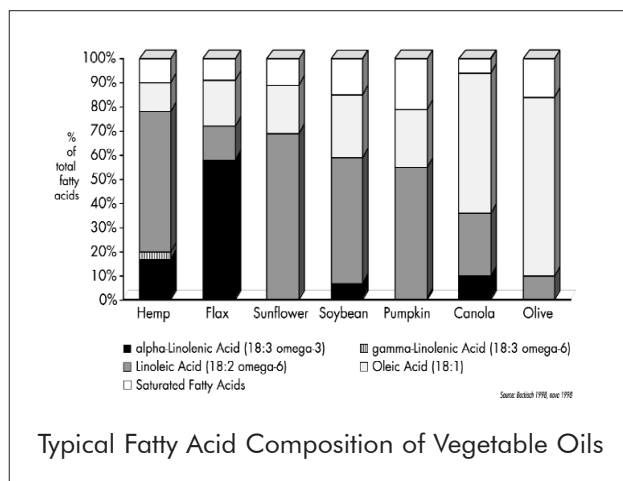
Hemp oil also provides significant amounts of the more rare 'super' polyunsaturated fatty acids, notably gamma-linolenic acid (GLA) and stearidonic acid (SDA). These are not essential themselves, but our body only naturally produces them from the LA and ALA essential fatty acids, respectively.

Supplementation with GLA and SDA appears to alleviate the symptoms of atopic dermatitis and other skin diseases in some patients. Clinical trials of the putative benefits from ingested hemp oil are currently under way at the University of Kuopio in Finland to assess the extent of these potential benefits. GLA and SDA content in hemp seed vary considerably with variety and this needs to be considered when using hemp oil to treat such symptoms.

Hemp oil typically contains less than 10% saturated fatty acids, and no trans-fatty acids, which are particularly



Typical Composition of Hemp Nut



Typical Fatty Acid Composition of Vegetable Oils



Hemp is Nutritious & Delicious

detrimental to our blood cholesterol balance. To avoid conversion of polyunsaturated fatty acids to unhealthy peroxides at higher temperatures, hemp oil and nut are best used for cold and warm dishes where temperature is kept below the boiling point (212° F). Hemp oil should not be used for frying. When using it for light sautéing, keeping the pan

at low heat and with sufficient moisture in the bottom limits both temperature and the formation of peroxides and off-flavors. Hemp nut can be lightly toasted and baked in bread and pastry dough keeping in mind these temperature and moisture caveats.

Hemp protein is also of exceptionally high quality in terms of amino acid (AA) composition and protein structure, the latter affecting digestibility and utilization by the human body. Hemp protein contains all of the essential amino acids in more nutritionally significant amounts and at a ratio closer to "complete" sources of protein (like meat, milk and eggs) than all other oil seeds except soy. Hemp protein consists of two globular proteins, albumin (33%) and edestine (67%), with a structure very similar to proteins manufactured in our blood and is thus readily digestible. Hemp protein appears to be free of antinutrients that are found in soy to interfere with protein uptake. So, eating hemp seed or nuts delivers protein with a favorable AA composition and in a structure readily utilized.

Hemp's nutritional advantage over other sources of fats and protein thus lies in its highly desirable balance of basic nutrients. Simply put, when eating hemp seed, nut and/or oil, our body obtains much of what it needs without the caloric ballast of non-essential nutrients. Yet, unlike fish and flax oil supplements and assorted protein powders, properly processed hemp seed offers these benefits with the additional bonus of a nice flavor profile - hemp tastes good. Fresh cold-pressed hemp oil and hemp nut, particularly when toasted, add a nice nutty flavor to many dishes and packaged food products. Hemp nut and oil therefore are attractive both nutritionally and culinarily, rendering them truly modern food sources.

Gero Leson, D.Em. is an environmental scientist and consultant with extensive experience in food and fiber uses of hemp and other renewable resources.

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Resources

Gero Leson and Petra Pless, "Hemp Foods and Oils for Health," HempTech, Sebastopol, CA

For a recent referenced overview of the benefits of hemp seed and oil by Darrell Tanelian, MD, see www.freshhempfoods.com/pdf/forgotten.pdf

For an NIH workshop on the essentiality of and Dietary Reference Intakes (DRIs) for omega-6 and omega-3 fatty acids, see ods.od.nih.gov/news/conferences/w6w3_abstracts.html



**TestPledge:
Addressing Marketplace Concerns About Drug Testing**

The Hemp Industries Association (HIA) initiated the TestPledge program in August of 2001 to assure consumers that eating hemp foods cannot cause a confirmed positive drug test for marijuana. Virtually all manufacturers of hemp nut (i.e., shelled hemp seed) and oil products in North America have signed onto the TestPledge program, including Gertrude & Bronner's Magic ALPSNACK. TestPledge companies commit to maintaining quality control measures which limit the amount of harmless trace residual tetrahydrocannabinol (THC) in hemp oil and nut, thus eliminating the risk of a confirmed positive drug test for consumers of hemp.

Canadian regulatory THC limits have been the de facto norm for U.S. hemp seed processors since mid-1998, after the official Canadian Hemp Regulations went into effect. Unfortunately, the Drug Enforcement Administration (DEA) continues to use past drug test interference problems from the mid-1990s as a pretext to harass the legitimate hemp industry. This policy is hypocritical as the DEA has not attacked poppy seed bagel makers for promoting opium use, despite the fact that poppy seeds come from the same plant species as does opium and contain trace opiates which have historically interfered with narcotics drug testing. The U.S. government has also not harassed fruit juice companies regarding trace alcohol in juice present through natural fermentation.

Please encourage your legislators in Washington, DC to switch regulatory control of hemp from the DEA to the USDA and to work with the hemp industry to develop and implement reasonable hemp regulations.

For further information on TestPledge, go to www.TestPledge.com.