



Hempseed oil

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Hempseed oil (HSO) refers to oil extracted from the seeds of the hemp plant, a variety of *Cannabis sativa* L. (industrial hemp) approved for cultivation, with a Δ -9-tetrahydrocannabinol (THC) concentration below 0.3%. In New Zealand, regulations stipulate levels below 0.35%. Hemp seeds, a rich source of highly digestible protein and nutrients, contain ca. 35% oil, extracted by cold pressing. Used medicinally and nutritionally, HSO is purported to be effective for constipation, hypertension, dyslipidaemia, inflammatory autoimmune conditions, atopic dermatitis, psoriasis, and acne. As a drying oil, HSO is also used in varnishes, paints, fuel, plastics, soaps, shampoos and detergents.

COMMON NAMES

Hemp oil is often used interchangeably with hempseed oil; however, hemp oil commonly refers to oil extracted from the flowers of the hemp plant, and contains a range of cannabinoids, more frequently cannabidiol (CBD).

LATIN NAME

Cannabis sativa L., family Cannabaceae

PREPARATIONS

Hempseed oil can be found as an unrefined oil for cooking, and as a supplement in the form of drops, softgels, capsules, sprays and balms. Skin-care and cosmetic products include hand and nail treatment, scalp treatment, conditioner, face and body oil, deodorant.

Preparations marketed as 'full-spectrum' refer to products containing additional compounds such as CBD. Although hemp seeds produce negligible quantities of THC, contamination is thought to occur during processing, and testing of commercial hempseed products has found THC in some samples ranging in concentration 0.3–19.7 $\mu\text{g/mL}$, CBD from 6.7 to 63.4 $\mu\text{g/mL}$, and cannabidiol from 0.1 to 2.3 $\mu\text{g/mL}$. Inconsistencies in product naming can result in unintended consumption of CBD and THC with adverse effects and legal problems during random drug screening.

ACTIVE CONSTITUENTS

Hemp seeds contain over 80% polyunsaturated fatty acids (PUFAs), with rich quantities of essential

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Summary message

Despite the evidence presented in some studies, there is no strong evidence to support to the use of hempseed oil (HSO), and more high-quality human trials are needed to substantiate medical claims. Some hempseed products are marketed without a clear distinction between HSO and cannabidiol oil. Without identification, quantification, and standardisation of known and unknown active compounds and different formulations of hemp products from various cultivars, data will continue to be challenging to interpret and compare. HSO is likely to be safe when used for up to 6 months. Allergies may occur in susceptible people and in those allergic to cannabis. Use is not recommended in children, pregnancy and lactation due to insufficient evidence. Caution is advised with antihypertensives as HSO may lower blood pressure. Products should be stopped 2 weeks before scheduled surgery.

Herbal medicines are a popular health care choice, but few have been tested to contemporary standards. **POTION OR POISON?** summarises the evidence for the potential benefits and possible harms of well-known herbal medicines.

fatty acids, ie linoleic acid (omega-6) and α -linoleic acid (omega 3). Gamma-linoleic acid (omega 6) and stearidonic acid are present in smaller quantities. The 3:1 ratio of omega-6 to omega-3 is considered the optimal ratio for health.

MANUFACTURERS CLAIMS

Hemp seed oil is claimed to nourish hair, skin and nails; improve post-exercise recovery; improve joint mobility; reduce pain and stiffness; support a healthy immune system, cardiovascular and other organ function; control anxiety and stress; promote balanced hormone levels, metabolism and mood.

EVIDENCE FOR EFFICACY

The evidence for dietary PUFAs is well documented; however, supplementation with HSO remains inconclusive. While HSO has been shown to reduce HDL-cholesterol, triglycerides and other atherogenic parameters in genetically obese rats, in human studies, effects on lipid profile are less clear. In 36 hyperlipidaemic children, eight weeks of HSO supplementation significantly increased the levels of PUFAs and omega-3 index, but there was no change in lipid profile. Similarly, in normolipidemic subjects over 12 weeks, no significant effects on lipid profile, LDL oxidation, or platelet aggregation were seen. Reasons postulated for these findings include intrinsic differences in the absorption and/or metabolism of PUFAs, and requirements for higher dosing.

In multiple sclerosis (MS), some evidence exists for the suppressant effects of omega-3 on proinflammatory Th1 cytokines. A double-blind, randomised-controlled trial with 100 MS patients found a 9:1 combination of HSO and evening primrose oil in a dose of 18–21 g/day over 6 months exhibited immune-modulating effects with significant improvements in the extended disability status scale score and the relapse rate compared to a control group receiving olive oil.

In atopic dermatitis, a 20-week controlled, single-blind, crossover study with 20 atopic patients, reported significant changes in plasma fatty acid profiles, subjective clinical improvement in skin

dryness and itchiness, and a reduction in dermal medication use with 2 tablespoons of HSO daily compared with olive oil for 8 weeks. However, a high risk of bias is introduced by the first author's financial interests in HSO.

Study design limitations and discrepancies in levels of HSO bioactive compounds, make direct comparisons between studies challenging. Further controlled studies are required to achieve a complete understanding of the effects of HSO in the modulation of medical conditions.

ADVERSE EFFECTS

A dry mouth, hypotension, light-headedness, drowsiness, and diarrhoea have been reported. Some people may experience an allergic reaction to hemp seed products, with anaphylaxis reported in one person.

Unintended intoxication has been reported in patients consuming HSO with higher concentrations of THC. Four patients reported psychological and gastrointestinal issues, and a toddler prescribed HSO to strengthen his immune system, exhibited stupor and low stimulatability after ingesting HSO for 3 weeks. Neurological symptoms disappeared after intravenous hydration.

DRUG INTERACTIONS

Moderate caution is advised with antihypertensive medication as HSO may lower blood pressure. Hemp seed may also inhibit platelet aggregation and interact with anticoagulants.

Key references

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