Liposomal Cannab-FS™ 400

designs for health®

Full spectrum phytocannabionoids using liposomal technology for superior absorption and bioavailability

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Liposomal Cannab-FS™ 400 provides 400 mg full spectrum phytocannabinoids derived from hemp per bottle, yielding 16 mg of active phytocannabinoids per serving. It contains natural terpenes, aromatic compounds from the hemp plant that work synergistically with phytocannabinoids, complementing their health-promoting properties. Tocotrienols and phospholipids (from sunflower lecithin) are included to preserve the phytocannabinoids, while natural citrus oils are included for taste enhancement. Liposomal Cannab-FS™ 400 is formulated using cutting-edge liposomal technology for optimal absorption and bioavailability, making it an ideal choice for acute situations where rapid uptake of phytocannabinoids is desired. All Cannab-FS(tm) products contain less than 0.3% THC.

What Are Phytocannabinoids?

Phytocannabinoids are plant-derived compounds capable of directly interacting with cannabinoid receptors throughout the body and producing biological actions similar to those of endogenously produced endocannabinoids. Over 100 phytocannabinoids exist in various species of the Cannabis plant, making them highly useful for health-supportive purposes*. Clinical research has focused primarily on the psychotropic cannabinoid, tetrahydrocannabinol (THC), and its non-psychotropic antagonist, cannabidiol (CBD); however, more recent research has identified a variety of phytocannabinoids with wellness-promoting benefits.[1]

CBD is harvested from the flowers, seeds, and/or stalk fibers of *Cannabis sativa L,* otherwise known as hemp when containing less than 0.3% THC. However, extensive and highly controlled interbreeding between Cannabis species has allowed cultivators to control the THC/CBD ratio of each species, as well as the quantity of additional phytocannabinoids.[1] Historically, under the Controlled Substances Act, all cannabis cultivation was prohibited due to its THC content which classified cannabis as a Schedule 1 drug according to the Drug Enforcement Administration (DEA). However, legislation in the 2018 Farm Bill descheduled some cannabis preparations that fell under defined limitations. Hemp, specifically, was descheduled and defined by federal law as "the plant *Cannabis sativa L.* and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis."[2] Following this legal action, research, manufacturing, and marketing of CBD has been soaring.

The Endocannabinoid System

CBD, THC, and other phytocannabinoids act upon the endocannabinoid system of the human body, which is a signaling system interwoven throughout the central nervous system and distributed among peripheral tissues including the immune and reproductive systems, gastrointestinal tract, sympathetic ganglia, endocrine glands, arteries, lungs and heart.[3] Phytocannabinoids function in the same capacity as the body's endogenously produced endocannabinoids, arachidonoyl ethanolamide (anandamide) and 2-arachidonoyl glycerol (2-AG), and modulate the system's two G-protein coupled cannabinoid receptors, CB1 and CB2.[4]

CBD, specifically, is an agonist for the CB2 receptors which are distributed throughout the brain, immune system, spleen, and leukocytes.[5] The CB2 receptors are intricately involved in various functions of these organ systems but are distinct from CB1 receptors in that activation does not generate any psychotropic effects.[6]

What is "Full Spectrum"?

The efficacy of cannabis is enhanced by the presence of all the natural terpenes (such as limonene, myrcene, α-pinene, linalool, β-caryophyllene, caryophyllene oxide, nerolidol and phytol) and phytocannabinoids (such as THC, CBC, CBN, CBG, THCA, THCV, CBGA, CBDV) found throughout the entire hemp plant, including the flowers, seeds, and stalk fibers.[7,8]

These biologically active compounds function synergistically to enhance the effects of the phytocannabinoids, but the content varies widely between each cannabis strain as well as the method of extraction employed.[7] The full spectrum of phytocannabinoids are found primarily in the aerial parts of the hemp plant, but traces are also found in the leaves, stalk fibers, and seeds.[7,8] The lot number of each Liposomal Cannab-FS™ 400 product includes a certificate of analysis (COA) that indicates the specific quantity of each phytocannabinoid and terpene, ensuring its true "full spectrum" efficacy.

Apart from THC and CBD, phytocannabinoids have not been widely studied, but past research has shown health-promoting, supportive applications for the following most common phytocannabinoids present in full spectrum formulations:[9]

- Cannabichromene (CBC)
- Cannabigerol (CBG)
- Tetrahydrocannabivarin (THCV)
- Cannabidivarin (CBDV)
- Cannabidiolic acid (CBDA)
- Cannabigerivarin (CBGV)
- Cannabichromivarin (CBCV)

The "Entourage Effect"

Early cannabis research discovered that the numerous "inactive" compounds in cannabis worked together to enhance the activity of endogenous cannabinoids, anandamide and 2-AG. This synergistic effect was coined the "entourage effect" and distinguished powerful cannabinoid products. Today, the "entourage effect" more specifically refers to the synergistic interactions between phytocannabinoids and terpenes, and is an indicator of a product's supportive potential.[9] The entourage effect is not only vital for its ability to counteract the psychotropic effects of THC, but also to ensure the beneficial value of cannabinoids.[9] For example, animal studies using pure CBD for analgesia noted a biphasic, dose-response curve in which the therapeutic effect had dose limits; however, a full spectrum cannabinoid therapy showed analgesic effects with no identified ceiling effect owing to the entourage effect.[9]

Sourcing & Purification

As vigilant bioaccumulators, cannabis plants from wild sources are often contaminated with various substances including chemicals such as pesticides, heavy metals, molds and bacteria. A controlled growing environment is vital for quality and purification. Designs for Health offers a complete COA showing proof of sourcing, purity, and a breakdown of phytocannabinoid content for each product lot number at dfhhemp.com.

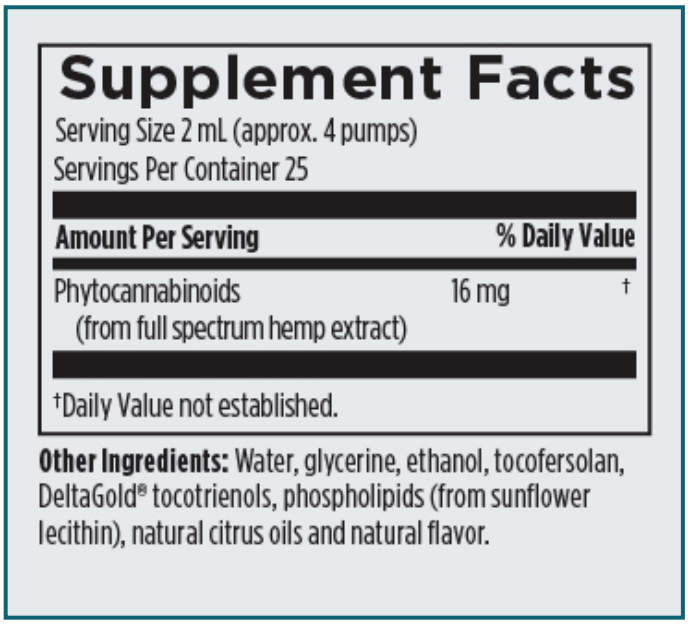
What are Liposomes?

Liposomes are spheres made of phospholipids—the primary building blocks of cell membranes. Owing to this structure, liposomes bond easily with cell membranes to facilitate intracellular delivery of their nutrient cargo. Thanks to this enhanced delivery and absorption, nutrients delivered in liposomal form at lower doses may have equal or greater efficacy than higher doses provided in forms that are less bioavailable.

Designs for Health's Liposomal Cannab-FS™ 400 employs liposome particles that are 50-100nm in size, in contrast to 200-600nm particles that are more commonly available from other manufacturers. The smaller sized particles result in increased oral and cellular uptake and faster transmucosal absorption in the mouth, in addition to enhanced absorption throughout the rest of the gastrointestinal tract. In fact, it is recommended to hold the product in the mouth for 30 seconds before swallowing to take advantage of this effective route of absorption. Additionally, clearance of these particles from the bloodstream (via the liver and spleen) is inversely related to size: the smallest particles circulate the longest, increasing the likelihood of absorption at their target tissues. Note that the phospholipids used in this product are derived from sunflower lecithin (soy-free, non-GMO material).

Benefits of Liposomal Delivery

- Superior absorption and intracellular delivery of nutrients
- Phospholipid structure allows for effective delivery of compounds with different solubilities carried within the same particle (e.g., water- and lipid-soluble compounds)
- Liposomes penetrate the blood-brain barrier, an obstacle for other various formulations
- While there is an opportunity for quick absorption in the mouth, liposomes also survive the acidic environment of the stomach, ensuring intestinal uptake and delivery to the lymphatic system
- Liquid liposomal formulations are convenient for those who prefer to swallow fewer pills; also allow for easy dosing



Supplement Facts

Serving Size 2 mL (approx. 4 pumps)
Servings Per Container 25

Amount Per Serving		% Daily Value
Phytocannabinoids (from full spectrum hemp extract)	16 mg	†

†Daily Value not established.

Other Ingredients: Water, glycerine, ethanol, tocofersolan, DeltaGold® tocotrienols, phospholipids (from sunflower lecithin), natural citrus oils and natural flavor.

Recommended Use:
Take 2 mL (approx. 4 pumps) and hold in mouth for 30 seconds before swallowing, or as directed by your health care practitioner.

For a list of references or tables cited in this document, please visit:
https://catalog.designsforhealth.com/assets/itemresources/LiposomalCannabFS400_References.PDF