

TECHNICAL DATA SHEET

Liver C Formula



Liver C Formula is one of the most complete hepatic support formulas combining proven botanicals from Chinese, Ayurvedic, and tradition western formularies. Three liver-specific stimulating mushrooms are utilized, as are key amino acid components, along with vitamins and minerals known to promote and maintain improved liver health and function. These liver-specific ingredients stimulate the regeneration of both hepatocytes and Kupffer's cells allowing the liver to better filter out environmental and food ingested toxins. The liver is responsible for detoxifying the two quarts of blood that pass through it every 60 seconds. When the liver is damaged and diseased, such as from hepatitis C, this filtration system breaks down and the result is more unfiltered toxins staying in the body overwhelming an already compromised system. Remarkably, the liver is able to repair itself with the aid of specific nutrients, detoxification programs, and paying close attention to what foods and drugs we consume.

INGREDIENTS

Alpha-Lipoic Acid was identified as a vitamin when it was isolated 50 years ago, but was reclassified upon finding that it is synthesized in humans and animals (1). Alpha-lipoic acid is both water and fat-soluble and can regenerate endogenous antioxidants, such as vitamin E, vitamin C, and glutathione, and prevent oxidative damage (2). Alpha-lipoic acid is rapidly depleted when the liver is under stress. It is highly effective in raising glutathione levels, which is believed to further generate liver repair in diseases such as hepatitis C and HIV, since both diseases cause glutathione deficiency. Unlike most antioxidants that work in either the fatty parts of the body (including the outer layers of cells) or the watery parts (including the blood), alpha-lipoic acid works in both. This ability allows alpha-lipoic acid to protect cells throughout the body. Children treated with alpha-lipoic acid, alone or in combination with vitamin E, showed normalized organ function and lessened indices of oxidative damage following radiation exposure in the Chernobyl accident (3).

N-Acetyl-Cysteine is the N-acetyl derivative of the amino acid L-cysteine. N-acetyl cysteine is a precursor of glutathione, which is a potent antioxidant. Glutathione can not cross the cell membrane, but N-acetyl cysteine easily crosses the cell membrane where it is converted to cysteine and, subsequently, glutathione. N-acetyl cysteine is a very efficient way to replenish glutathione and reduce damage caused by reactive oxygen species (ROS) (4). Alpha-lipoic acid has the ability to chelate heavy metals. The antioxidant effects of N-acetyl cysteine may explain its apparent ability to prevent adverse effects caused by toxic chemicals, drug reactions, and non-osmolality contrast agents (5).

Silymarin (Milk Thistle) seed is the most commonly used applicable part medicinally. Silymarin, the active constituent of the milk thistle seed, consist of four flavonolignans called silibinin (silybin), isosilybin, silichristin (silychristin), and silidianin.

Silymarin (continued) Silibinin makes up about 70% of silymarin (6). When ingested, silymarin undergoes enterohepatic recirculation and has higher concentrations in liver cells. Silymarin is a potent inhibitor of tumor necrosis factor (TNF). The cytotoxicity, inflammation, and apoptosis induced by TNF are effectively blocked by silymarin. Silybin is an antioxidant, a free radical scavenger, and an inhibitor of lipid peroxidation (7). Several activities seem to contribute to the therapeutic effect of silymarin in liver disease. Silymarin causes an alteration of the outer hepatocyte cell membrane that prevents toxin penetration. It also stimulates nucleolar polymerase A, resulting in increased ribosomal protein synthesis, which can stimulate liver regeneration and the formation of new hepatocytes (8). We purchase our silymarin from Euromed, which is the highest quality silymarin available and is standardized to contain 80% silymarin.

Artichoke uses the leaf, stem, and root as the applicable parts. The primary constituents include up to 2% phenolic acids, primarily chlorogenic acid, cynarin, and caffeic acid. Artichoke also contains up to 4% sesquiterpene lactones, and 1% flavonoids including scolymoside, cynaroside, and luteolin (9). Artichoke is a strong antioxidant and promotes healthy bile metabolism, more efficient blood flow and detoxification and protects and improves hepatic cell function in the liver (10).

Beet Leaf has anti-hepatotoxic effects. It effectively keeps fat from depositing in the liver (11). Beet leaf has a high concentration of betaine that is a methyl group donor in the liver's transmethylation process.

Black Radish Root is a root vegetable closely related to the turnip and horseradish family. Black radish root is rich in B vitamins, vitamin C, sulfur, and fiber. Black radish root aids in strengthening hepatic cell membranes and plays a vital role in eliminating ingested toxins.

Chelidonium (Celandine) relieves hepatic congestion, swollen bile ducts and sluggish liver action

... Continued on next page

Coriolus Mushroom uses the fruiting body and mycelium as the applicable parts. Coriolus contains several polysaccharides, including polysaccharide peptide (PSP) and polysaccharide krestin (PSK) shown to have antitumor and immunomodulating effects (12). Coriolus is specific for regenerating hepatocytes and Kupffer cells. This provides a more effective detoxification process promoting better liver health and function.

Cortydcepts Mushroom increases glutathione levels and protects the liver from toxic compounds. All three of our mushrooms are the best quality available and are certified to be organically grown.

Reishi Mushroom contains polysaccharides and terpenes, which promote proper enzyme activity in liver cells. Reishi mushrooms have a long and storied history in folk medicine, but researchers are just beginning to isolate and identify medicinal substances in reishi mushrooms that have antitumor, immune modulating, anti-aging, cholesterol lowering, hepatoprotective, antiviral and antibacterial effects (13).

Dandelion Root follows the bitter principles that are the principal constituents responsible for its effects on the liver, they increase bile production in the gall bladder and bile flow from the liver.

Gardenia Fruit is a well-known and respected Chinese herb known for its detoxifying properties, promotion of bile secretion, and its role as a liver tonic. Recent studies show its effectiveness and efficacy in treating cholestasis, primary biliary cirrhosis and hepatitis (14)

Phyllanthus Amarus is another well-known and respected Chinese herb known for its ability to treat chronic liver conditions. Phyllanthus contains bioflavonoids that have anti-inflammatory actions in the liver. Phyllanthus amarus suppresses hepatitis B virus by interrupting interactions between HBV enhancer I and cellular transcription factors (15).

Shizandra Berries is the third well-respected Chinese herb in our **Liver C Formula**. Shizandra berries are recognized as an excellent liver tonic and in Chinese medicine they are known to have rejuvenation effects on the body. It strengthens the liver by detoxifying heavy metals as well as other ingested toxins (16).

Magnesium is involved with more than 300 enzyme systems. Magnesium is required for the formation of cyclic AMP c(AMP) and is involved in ion movements across cell membranes.

Liver C Formula

Quantity: 90 capsules

Serving size: 3 capsules

Directions: 1 capsule, 3 times daily with food, or as directed by your physician.

Each 3 capsules contain:

Magnesium (as Citrate)	25 mg
Silymarin Extract (Milk Thistle) (80% Silymarin) (seed)	600 mg
Artichoke Leaf Extract (2% Cynarin) (leaf)	300 mg
Alpha Lipoic Acid	265 mg
NAC (N-Acetyl Cysteine)	200 mg
Coriolus Mushroom	150 mg
Dandelion Root Concentrate (4:1) (root)	150 mg
Turmeric Concentrate (4:1) (rhizome)	150 mg
Chelidonium Concentrate (4:1) (root)	75 mg
Cortydcepts Mushroom	75 mg
Phyllanthus amarus Extract (3%) (leaf)	75 mg
Reishi Mushroom	75 mg
Gardenia Concentrate (10:1) (fruit)	50 mg
Beet Concentrate (4:1) (leaf)	37.5 mg
Shizandra Berries Concentrate (10:1)	25 mg
Black Radish Concentrate (10:1) (root)	15 mg

Other ingredients: Vegetarian capsules

Contains No: wheat, dairy, soy, corn, or preservatives. No fillers, binders or flowing agents.

Patients: Consult with your healthcare professional for the proper dosage and use of this formula.

For more information about this and other Condition Specific Formulas®, please visit our website at:

www.mpn8.com



Portland, OR 97225

REFERENCES:

1. Free Rad Biol Med 1995; 19:227-50
2. Gen Pharmacol 1997; 29:315-31
3. Free Rad Biol Med 1995; 19:227-50
4. Altern MED REV 1998; 3: 114-27
5. N Engl J Med 2000; 343: 180-4
6. Drug Metab Dispos 2000; 28: 1270-3
7. Am J Gastroenterol 1998; 93: 139-43
8. J Hepatol 1989; Jul; 9(1): 105-113
9. Phytomedicine 1997; 4: 369-78
10. Toxicol Appl Pharmacol 1997; 144: 279-86
11. PDR for Herbal Medicines 1998; Gruenwald J, Brender T, Jaenicke C. Medical Economics Co, Inc
12. Gen Pharmacol 1998; 30: 1-4
13. Crit Rev Immunol 1999; 19: 65-96
14. Comparative Hepatology 2004; 3(suppl 1): S11
15. Eur J Clin Invest 1997 Nov; (11): 908-15
16. Eur J Clin Invest 1996; 8: 1069-1076