

Silybum marianum: Milk Thistle

Common names: Holy thistle, Marian Thistle, Our Lady's thistle, Mary thistle, St. Mary's thistle, Wild Artichoke, Mariendistel (Germany), Chardon-Marie (French). Legalon® (Germany), and Thisilyn (U.S.) and Marin® (US) are trade names. In Chinese, Milk thistle is known as Shui Fei Ji.

Similar plants: Milk thistle should not be confused with blessed thistle, *Cnicus benedictus*.



What It Is: The ripe seeds of the milk thistle plant. One of the most important constituents of milk thistle is silymarin, which itself consists of several constituents, the most prominent of which is silybinin (silybin).

What It Does:

Milk thistle is used by herbalists to nourish the liver, stomach, intestines, and kidneys. It is used also for liver disease, congestion of the liver or spleen, varicose veins, uterine hemorrhage and menstrual problems. It is used by some herbalists to increase lactation.

Milk thistle is used by conventional medical professionals for liver disease due to toxic insult, inflammatory liver disorders and cirrhosis. Milk thistle may be appropriate in the treatment of ketosis in cattle, increasing milk yield.

Silymarin is thought to:

- Act as an antioxidant
- Inhibit damage to liver cell membranes, thereby protecting against many toxins
- Protect against DNA injury
- Increase protein production by liver cells (one of the major functions of the liver)
- decrease glutathione destruction (glutathione is crucial to normal immune system function)
- Stabilize mast cells (when these cells degranulate from a tumor, animals can have a shock reaction)
- Decrease activity of tumor promoters

Diabetes: The silymarin component of milk thistle may decrease blood sugar, hemoglobin A1c, and LDL cholesterol levels when used with conventional therapy in people with type 2 diabetes. It has also been shown to reduce insulin resistance in people with coexisting diabetes and alcoholic cirrhosis. It can sometimes reduce insulin need in diabetics.

Liver: Silymarin is thought to act as a liver-protectant. One preliminary study of a specific silybinin preparation improved liver function in people with chronic active hepatitis. However, most studies in

patients with hepatitis B or C have generally not shown an improvement in mortality or liver function using milk thistle or preparations of milk thistle. Similarly, in liver cirrhosis (alcoholic and non-alcoholic), some preliminary clinical studies suggested that milk thistle might improve liver function and mortality.

Preliminary evidence suggests that milk thistle extract standardized to 70% - 80% silymarin may protect the liver against damage from certain toxins, including drugs such as acetaminophen (Tylenol) and phenytoin (Dilantin).

Administered intravenously (IV), silybinin may lessen liver damage due to poisoning by *Amanita phalloides* mushroom (death cap) — although this IV preparation is not readily available in the U.S.

In one study of cattle given milk thistle seeds, milk production was increased and ketones in the urine reduced, as compared to controls.

Kidneys: silybin reduces oxidative damage to kidney cells in experiments. In rats, silybin prevented kidney toxicity due to one cancer chemotherapy drug (cisplatin), but did not prevent kidney damage by another chemotherapy drug (cyclosporine).

Blood lipids(cholesterol and triglycerides): silymarin may inhibit synthesis of cholesterol by the liver and reduce blood lipids.

Pancreas: As an antioxidant, silymarin can protect the pancreas against certain forms of damage. In a controlled trial of human diabetics, patients experienced decreases in blood glucose and insulin requirements.

Cancer: Silybinin is under investigation for use in preventing or treating various forms of cancer, especially prostate cancer.

Milk Thistle's Different forms:

Whole dried seed (powder, tablets or capsules): this is the most natural form, but may contain less consistent ingredients than the 70-80% concentrated extract discussed below. Dry milk thistle seed powder contains only 1.5% to about 3.0% silymarin. Consequently, pills made from seed powder contain about 9 to 15 mg of silymarin, while pills made from dry extracts contain approximately 112 mg to 240 mg of silymarin, depending on the size of the pill. People who prefer to use whole herb products as opposed to concentrated extracts should be aware that much larger doses of milk thistle will be necessary to get the same amount silymarin.

70-80% concentrated silymarin extract (powder, tablets or capsules): Most clinical studies of milk thistle's effectiveness have used specific dry extracts standardized to approximately 70 - 80% silymarin on a weight basis, so this is the form of milk thistle that has been studied the most. ***At this time, this is the type of milk thistle that we prefer to use.***

Alcohol based liquid extract: components of milk thistle are not very water soluble, so liquid extracts must be alcohol based. Be aware, however, that "liquid extracts" are not necessarily concentrated extracts. One liquid extract product tested in this Review indicated that it was made from milk thistle "seed" as opposed to a "seed extract." People who prefer to use whole herb products as opposed to concentrated extracts should be aware that much larger doses of milk thistle will be necessary to get the same amount silymarin. Cats often don't like the taste of alcohol based extracts, and may salivate profusely as a result.

Dosage:

Milk thistle should be used for at least 8 weeks before expecting results such as improvement in bloodwork.

- Dried whole seed: 15-20mg/lb once daily
- 70-80% silymarin extract: 2-5 mg/lb 2-3 times daily
- Alcohol extract: 2-5 mg/lb 2-3 times daily

Cautions and Concerns:

Milk thistle and its extracts are generally well-tolerated but, infrequently, can have a laxative effect and cause other gastrointestinal side-effects.

Some patients may have allergic reactions to milk thistle including itching, rash, hives, eczema, and anaphylaxis. Allergic reactions may be more likely to occur in patients sensitive to plants such as ragweed, chrysanthemums, marigolds, and daisies.

Although drug interactions have not been reported, milk thistle might reduce the effectiveness of oral contraceptives and it might inhibit certain liver enzymes (cytochrome P450 2C9), increasing the levels of certain drugs metabolized by it such as amitriptyline, diazepam, verapamil, and warfarin. Milk thistle may cause need for decreased insulin doses in diabetics.

When milk thistle should not be used (contraindications): No known contraindications have been reported. Milk thistle has been recommended for problems associated with the gallbladder during pregnancy, and so is likely to be safe even for pregnant and lactating animals.

Toxicology and Adverse effects: Milk thistle is relatively nontoxic, and in one study, mice tolerated a dose of 20g/kg, 1000x the usual dose. Allergic reactions have been reported.

ConsumerLabs Testing:

ConsumerLab.com has purchased and tested milk thistle products to determine which extracts on the market contained the level of silymarin on the label. All products were also tested for lead contamination, as this can occur in herbal supplements. Tablet and caplet products were additionally tested for their ability to properly break apart for absorption. Liquid products and standard capsules do not undergo this testing, as they will quickly release their contents.

To further assist consumers, ConsumerLab.com licenses its flask-shaped CL Seal of Approved Quality to manufacturers for use on labels of products that have passed its testing. ConsumerLab.com will periodically re-evaluate these products to ensure their compliance with ConsumerLab.com's standards. You can get more information about ConsumerLabs at <http://consumerlabs.com>.

As you can see in the test results table below, all milk thistle products are not equal, and consumers need to take care when buying these products. Those products which did not pass ConsumerLabs testing, or are for some other reason not recommended by us, are listed below as **NOT APPROVED**. Note that many of the recommended doses are for people, not animals. Only the Nutramax products are made for specifically for dogs and cats.

Product Name, Labeled Amount and Type of Milk Thistle per Unit, daily suggested serving size	Milk Thistle claimed per daily serving	RESULTS	Contained Claimed or Minimum Expected Amount	Did not exceed contamination limit for lead	Disintegrated properly
Dist= Distributor Mfd = Manufacturer	Silymarin claimed				
Bluebonnet Herbals Milk Thistle Extract (175mg 80% silymarin, 1 per day) Dist – Bluebonnet Nutrition	174 mg extract 140mg silymarin	NOT APPROVED	Found only 80% of claimed silymarin	✓	NA
CNCA Milk Thistle Pro 250 mg (250 mg 80% silymarin extract per capsule, 3 per day) Dist. - CNCA Health	250mg extract 200 mg silymarin	APPROVED	✓	✓	NA
Designs for health® Milk Thistle (140 mg 80% silymarin extract per capsule, 1 per day) Dist. - Designs for Health, Inc	140 mg extract 112 mg silymarin	NOT APPROVED Did not list plant part **	NA	NA	NA
Dr. Whitaker Milk Thistle Liver Cleanse (131.5 mg extract, 4 per day) Dist – Healthy Directions	526 mg extract 368.2 mg silymarin	APPROVED	✓	✓	NA
Enzymatic Therapy™ Milk Thistle X™ (150 mg 80% silymarin extract per ultracap, 6 per day) Mfd. - Enzymatic Therapy, Inc	900 mg extract 720 mg silymarin	NOT APPROVED	Found only 59.2% of claimed silymarin	✓	NA
Gaia Herbs Liquid Phyto-Caps Milk Thistle Seed (150 mg 80% silymarin extract per capsule, 3 per day) Dist. - Gaia Herbs	450 mg extract 360 mg silymarin	APPROVED	✓	✓	NA
GNC Herbal Plus Standardized Milk Thistle (200 mg extract, 1-3 per day) Dist - GNC	200-600 mg extract 160-480 mg silymarin	APPROVED	✓	✓	NA

Jarrow Formulas Milk Thistle Standardized Silymarin 30:1 (150 mg extract, 1 per day) Dist – Jarrow Formulas	150 mg extract 105 mg silymarin	APPROVED	✓	✓	NA
Natrol Milk Thistle Advantage 525 mg (262.5 mg extract, 2 capsules per day) Mfd - Natrol	525 mg extract 420 mg silymarin	NOT APPROVED	Found only 72% of claimed silymarin	✓	NA
Natural Factors Milk Thistle Extract 80% Silymarin (250 mg extract, 3-6 per day) Mfd – Natural Factors Canada	600-1200 mg extract 480-960 mg silymarin	NOT APPROVED	Found only 80.2% of claimed silymarin	✓	NA
Nature's Apothecary® Milk Thistle (500 mg seed per mL of liquid, 1-3 mL per day) Mfd. - Nature's Apothecary	500-1500 mg extract 400-1200 mg silymarin	NOT APPROVED	Found only 19.5% of claimed silymarin	✓	NA
Nature's Plus Herbal Actives Milk Thistle Extended Release (500 mg extract, 1 per day) Mfd – Natural Organics Laboratories Inc	500 mg extract 400 mg silymarin	NOT APPROVED	Found only 60.4% of claimed silymarin	✓	NA
Nature's Way® Thisilyn® Standardized Milk Thistle Extract Maximum Absorption Formula 2X (175 mg 80% silymarin extract per capsule, 3 per day) Dist. - Nature's Way	525 mg extract 420 mg silymarin	APPROVED	✓	✓	NA
Nutramax Marin for cats (silybin A+B 9 mg per tablet with phosphatidyl choline, 1-2 daily) Mfd. - Nutramax		APPROVED	✓	?	✓

Nutramax Marin for small to medium dogs (silybin A+B 24 mg per tablet with phosphatidylcholine and zinc, 1/4-1 daily) Mfd. - Nutramax		APPROVED	✓	?	✓
Nutramax Marin for large dogs (silybin A+B 70 mg per tablet with phosphatidylcholine and zinc, ½ to 1-½ daily) Mfd. - Nutramax		APPROVED	✓	?	✓
Nutricology Innovative Nutrition Phyllanthus Complex (200mg extract, 2-3 per day) Formulated for Nutricology, Dist nor Mfd on label	400-600 mg extract 320-480 mf silymarin	NOT APPROVED	Found only 58.6% of claimed silymarin	✓	NA
Planetary Herbals™ Full Spectrum™ Silymarin 80™ 260 mg (210 mg 80% silymarin extract and 50 mg organic seed per tablet, 1-2 per day) Dist. - Planetary Formulas	210-420 mg extract 168-336 mg silymarin	NOT APPROVED	Found only 64% of claimed silymarin	✓	NA
Pure Encapsulations Silymarin Milk Thistle Extract (250 mg extract, 1-4 per day) Mfd – Pure Encapsulations	250-1,000 mg extract 200-800 mg silymarin	NOT APPROVED	Found only 77.4% of claimed silymarin	✓	NA
Puritan's Pride® Silymarin Milk Thistle 1000 mg (250 mg of a 4:1 extract equivalent to 1,000 mg seed per softgel, 1-2 per day)*** Mfd. - Puritan's Pride	250-1,000 extract 62.5 – 250 mg silymarin	APPROVED	✓	✓	NA
Rainbow Light® Herbal Prescriptives Milk Thistle Plus™, (500 mg of 4:1 extract p, 3 per day) Dist – Rainbow Light Nutritional Systems	1,500-3,000 mg extract 120-240 mg silymarin	NOT APPROVED	✓	Found 0.9 – 1.8 mcg lead per daily serving	✓

Rite Aid Milk Thistle 200 mg (200 mg 80% silymarin extract per capsule, 1-3 per day) Dist. - Rite Aid Corporation	200-600 mg extract 160-480 mg silymarin	NOT APPROVED	Found only 65.8% of claimed silymarin	✓	NA
Shaklee Liver DTX Complex (100 mg extract, 3 per day) Dist – Shaklee Corporation	300 mg extract 210 mg silymarin	APPROVED	✓	✓	NA
Trader Darwin's™ Milk thistle 250 (250 mg 80% silymarin extract per capsule, 1-6 per day) Dist. By Trader Joe's	250-1500 mg extract 62.5-1200 mg silymarin	APPROVED	✓	✓	NA
Trunature (Costco) Milk Thistle (200 mg extract, 3 per day)	600 mg extract 480 mg silymarin	APPROVED	✓	✓	NA
Vitamin World® Silymarin Milk Thistle 1000 mg (250 mg of a 4:1 extract equivalent to 1,000 mg seed per softgel, 1-2 per day)	Dist. By Vitamin World, Inc	APPROVED	✓	✓	NA
Whole Foods™ Standardized Milk Thistle 100 mg (100 mg 80% silymarin extract per capsule, 4-6 per day)	Dist. By Whole Foods	NOT APPROVED	Found only 64% of claimed silymarin	✓	NA

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