Weight Loss & Liver Support

Goal

Weight loss & Liver Support contains natural substances known to support the health and proper functioning of the liver, especially when unwanted fat accumulates as a result of weight gain which subsequently leads to poor liver health.[1] Extra fat in the liver is increasingly common and associated with poor glucose management and overweight/obesity which have reached epidemic proportions in developed countries. Reports on the prevalence of poor liver health due to excess fat, suggest that 27-34% of the general population in the U.S. and 40-90% of the obese population worldwide have this problem.[2]

Rationale

A liver is termed “fatty liver” if lipids account for more than 5% of its weight. Beyond weight gain itself, the mechanisms for the development of fatty liver are varied. A reduction in the hepatic oxidation of fatty acids because of mitochondrial dysfunction can lead to microvesicular steatosis. Another mechanism is related to an imbalance between fat uptake and secretion, with high insulin-to-glucagon ratio states leading to macrovesicular steatosis.[3] These conditions "clog" the liver, disrupting its ability to convert food to energy and utilize fat. Diet, weight loss and specific nutrient ingredients such as choline, milk thistle (silymarin), N-acetyl-cysteine (NAC) have been shown to be successful in the supporting proper liver structure and function.[1,2,3,4,5] Also contained in this product is Epigallocatechin gallate (EGCG) from green tea for its potential hepatic protection including antioxidant properties.[5,6,7] *Irvingia gabonensis* has been included in this formula for its potential to improve weight loss results and related metabolic outcomes.[8,9]

In summary, weight gain and/or poor eating habits often lead to an unhealthy liver with excess fat, which increases the oxidative stress on this vital organ and compromises its overall functioning including inhibiting the body's ability to control proper usage/burning of sugar and fat.[1,2,10,11,12,13]

Choline is a water-soluble essential nutrient.[14] It is an important phospholipid component of the cell membrane and is the precursor molecule for the neurotransmitter acetylcholine. Choline has important roles in fat metabolism in the liver including promoting lipid (fat) transport from the liver.[15,16] Thus, choline is a lipotropic agent that has been shown to hasten the removal of fat from the liver.[17,18,19] Recently the Institute of Medicine (IOM) established the adequate intake (AI) of choline at 425-550 mg/day for women and men respectively, and that choline deficiency can have a negative impact on different health states especially related to fatty liver.[20,21,22] There is now evidence that current choline recommendations may be suboptimal for a large percentage of the population and that many others may have intakes below even the current recommendations.[23,24,25,26] This fact has been highlighted in a study involving normal weight Chinese women. The results demonstrated that higher choline intakes were associated with lower risk of poor liver health including too much liver fat.[27] This product contains ~400 mg of choline in a daily dose to complement shortages in normal synthesis and diet in order to reach daily levels shown to have a positive effect on managing liver health.

Milk thistle is derived from the milk thistle plant *Silybum marianum*, silymarin is a complex mixture of six major flavonolignans (silybins A and B, isosilybins A and B, silychristin, and silydianin), as well as other minor polyphenolic substances.[28] Milk thistle has been used safely for centuries in the treatment of liver problems including improving circulation, maintaining the integrity of liver cell membranes while increasing the liver’s regenerative ability and formation of new cells.[29,30,31,32] Milk thistle also exhibits antiviral, anti-inflammatory, and immunomodulatory functions in human liver and immune cells.[33,34] Doses of 140-700 mg have been used safely and effectively in patients with compromised liver health.[35,36,37,38,39]

N-acetyl cysteine (NAC) is added because it acts as an antioxidant and hepatoprotectant in order to help combat oxidative stress,[40] including that brought on by accumulating fat in the liver.[41,42] NAC works to block the propagation of lipid peroxidation and may also help in the prevention of the onset of NAFLD. A three-month clinical trial supplementing NAC improved alanine-transaminase (ALT) levels and the size of the spleen in patients with poor liver health (both markers of liver function), demonstrating its effectiveness against liver fat infiltration.[43]

Epigallocatechin gallate (EGCG) from green tea is included because it is one of the best documented plants that have been used in support of maintaining liver health.[32,44] It is generally agreed upon that much of the positive health effects of green tea (GT) are mediated by its polyphenols, known as catechins.[5,45] The major catechins in green tea are EGCG, (-)-epicatechin-3-gallate, (-)-epigallocatechin, and (-)-epicatechin. EGCG accounts for 50% to 80% of GT catechins amounting to ~200 to 300 mg per brewed cup of green tea.[46] EGCG also works as an antioxidant and has the potential to destroy fat cells[47], increase overall energy expenditure,[48,49] and has demonstrated positive effects on fat oxidation.[50,51,52,53,54,55] Recent findings suggest that green tea catechin consumption enhances exercise-induced changes in abdominal fat and serum triglycerides in humans[56] and in animal models.[57] Most recently Justin D Roberts, Michael G Roberts et al, using 571 mg/d of a decaffeinated GT extract (providing 400 mg/d of EGCG) for four weeks in exercisers found a 24.9% increase in fat oxidation rates, a 1.63% decrease in body fat and a 10.9% improvement in performance distance covered (20.23 KM to 22.43 KM), all compared to placebo.[58] This study strongly supports EGCG's ability alone to increase fat oxidation.

Irvingia gabonensis (AKA African Mango), a fleshy West African fruit, is common in traditional Nigerian and Cameroonian cuisine. Initial observations suggested beneficial changes in metabolic parameters (e.g. cholesterol, lipid profiles, insulin signaling, etc.) were associated with the high fiber content of *Irvingia gabonensis*.[8] Results of later analysis suggested that those beneficial observations of Irvingia gabonensis (IG) could not be from fiber content alone.[59] An *in vitro* study using a validated experimental model (murine 3T3-L1 adipocytes) to determine IGs potential mechanisms of actions, provided compelling data that the Irvingia gabonensis seed extract may inhibit adipogenesis (activation/formation of fat cells) through modulation of peroxisome proliferator-activated receptor gamma (PPAR gamma), which regulates fatty acid storage and glucose metabolism (the genes activated by PPARG stimulate lipid uptake and adipogenesis by fat cells),[60] and modulation of glycerol-3 phosphate dehydrogenase (enzyme which serves as a link between carbohydrate and lipid metabolism). These actions are in addition to IGs potential beneficial impact upon leptin (appetite hormone) and adiponectin (involved in regulating glucose levels as well as fatty acid breakdown).[61]

Preliminary clinical research showed taking 1.05 grams of a crude seed extract three times daily combined with a low fat, low calorie diet of 1,800 kcal/day reduces weight by about 4 kg after four weeks, compared to no weight reduction in overweight patients taking placebo.[8] Another preliminary clinical study (see Figure 3 below) demonstrated that a standardized seed extract (IGOB131), (also used in Weight Loss & Liver Support) taken at 150 mg twice daily for 10 weeks can reduce weight by 12.8 kg, compared to 0.7 kg in overweight patients taking a placebo.[9] In this study, overweight patients taking Irvingia gabonensis (IG) consumed an average of 2,767 kcal/day compared to 3,156 kcal/day in the placebo group, suggesting favorable effects on appetite. The IG group also decreased total and LDL cholesterol levels by 26% and 27% respectively, compared with 2% and 5% with placebo. Similar results also occurred in a study using a combination of standardized Irvingia gabonensis seed extract (IGOB131) and Cissus quadrangularis, for 10 weeks in overweight adults.[62]

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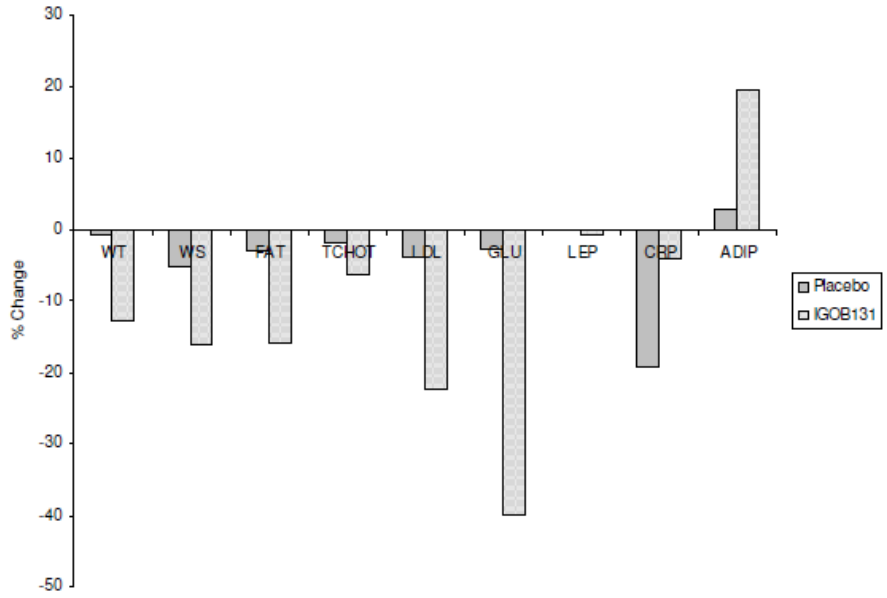

Figure 3
Percentage decrease in body weight (WT), Waist size (WS), Fat (FAT), Total Cholesterol (TCHOL), LDL cholesterol (LDL), Glucose (GLU), Leptin (LEP), C-reactive protein (CRP) and Adiponectin (ADIP) after 10 weeks of use of extract IGOB131.

Typical Use

- Non-stimulant fat-loss aid
- Recommended for overweight people to support a complete weight loss program and liver health
- Can be used alone or as part of the dotFIT 90 Day Weight Loss Solution (a.k.a. LeanPak 90)
- Take one tablet, three times daily, 30 minutes before meals with at least 8 fl. oz of water
- Discontinue after reaching fat loss goal

Precautions

Weight Loss & Liver Support is generally considered a safe fat-loss aid. Theoretically, concomitant use of choline (higher doses than found in this product) and atropine may decrease the effects and side effects of atropine.[63] Diabetes: milk thistle constituents might lower blood glucose in patients with type 2 diabetes. People with diabetes using milk thistle products should monitor blood glucose levels very closely. Dose adjustments to diabetes medications might be necessary.[64,65] People with liver disease should consult with their physician before using a product containing ECGC.[66]

Contraindications

Weight Loss & Liver Support is contraindicated in pregnancy and lactation because of a lack of data for this population. Because of NAC, do not take if using anticoagulant drugs or nitroglycerine.

Adverse Reactions

Milk Thistle: Orally, milk thistle is usually well-tolerated.[39] Uncommon events may include an occasional laxative effect, nausea, diarrhea, dyspepsia, flatulence, abdominal bloating, fullness or pain.[67]

EGCG: typical doses range from one to 10 cups of green tea per day without any adverse events.[68] Very high intake of green tea may cause nausea, abdominal bloating and pain, flatulence, and diarrhea. It can also cause central nervous system stimulation and adverse effects such as dizziness, insomnia, fatigue, agitation, tremors, restlessness, and confusion. These effects are more common with higher doses of green tea or green tea extract, equivalent to 5-6 liters of tea per day.[69]

Choline is not likely to cause side effects at doses up to 3,000 mg/day.[70] Doses at very high levels can include sweating, a fishy body odor and gastrointestinal distress.[71]

Irvingia gabonensis: The only side effects reported using the specific standardized extract of Irvingia gabonensis (IGOB131) were flatulence, headaches, and difficulty sleeping, which were similar to the reports in the placebo group.[9]

Upper Limit/Toxicity

Choline: The UL for choline is 3,500 mg/day and the LOAEL is 7,500 mg/day.

NAC: The LD50 for NAC in mice is 7,888 mg/kg and in rats is 6,000 mg/kg. An AMES test performed on NAC was negative for mutagenicity.[31]

Milk Thistle is considered relatively safe for long-term use.[72]

EGCG: High doses of green tea or green tea extract, equivalent to 21-25 cups of tea per day can cause gastrointestinal distress.[73,74]

Irvingia gabonensis: no data available at this time.

Summary

Purpose

- Supplies natural substances known to support fat metabolism and liver health especially in overweight people with extra liver fat
- Non-stimulant body fat/weight reduction aid for overweight people
- For very overweight or obese people (females >32% body fat and males >22%) to support liver health

Unique Features

- The product potentially works at many different levels within the body (antioxidant, appetite, liver fat and sugar metabolism, etc.) to support the loss of body fat and overall metabolism
- Blend is proprietary to dotFIT™
- Can be used alone or as part of the dotFIT 90 Day Weight Loss Solution (aka LeanPak90)
- Manufactured in compliance with Good Manufacturing Practices (GMPs) exclusively for dotFIT, LLC

Supplement Facts Panel

Supplement Facts

Serving Size: 1 Tablet
Servings Per Container: 90

	Amount Per Serving	% DV
Green Tea (Camelia Sinensis) Leaf Extract [Standardized to 98% Polyphenols (196 mg), 80% Catechins (160 mg), 45% EGCG (90 mg), 2% Caffeine (naturally occuring 4 mg)]	200 mg	*
Choline (as Choline Bitartrate)	133 mg	*
N-Acetyl Cysteine	50 mg	*
Milk Thistle (Silybum Marianum L.) Seed Extract (Standardized to 80% Silymarin)	166 mg	*
Irvingia Gabonensis Seed Extract	150 mg	*

* Daily Value not estabilished

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