

In The Name Of God

Food Supplements for Weight Loss

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“The global market for weight loss products and services should **grow from \$254.9 billion in 2021 to reach \$377.3 billion by 2026**, at a compound annual growth rate **(CAGR) of 8.2%** during the forecast period of 2021-2026..”

—GlobeNewsWire August, 2021

Total Segmentation

Supplements

Acetyl-L-

Carnitine

Carb Blockers

Detox & Cleanse

Dietary Fibers

Diuretics

Fat Burners

Garcinia Cambogia

Green Coffee Bean Extract

Raspberry Ketones

Appetite Control & Suppressants

Diet Kits & Systems

Ready to Drink Shakes

Introduction

- ▶ Obesity is now recognized as a pathological Condition, one that has a direct effect on morbidity and mortality
- ▶ The epidemic of obesity is expanding worldwide, which makes obesity a global public health problem.

- ▶ Alternative medicines have been used worldwide for many years to treat illness or promote health
- ▶ Health services such as massage therapy, acupuncture, chiropractic care, and natural and herbal products can all be defined as alternative therapy.

Basic definition

- ▶ FDA regulates dietary supplements under DSHEA, which covers vitamins, minerals, herbs or other botanicals, amino acids, certain dietary substances, or derivatives of these items.
- ▶ A product that contains any active ingredient not on the preceding list—such as synthetic ingredients that are sold in over-the-counter drugs and prescription medications—may not be marketed as a dietary supplement.

Types of supplements used to lose weight

- ▶ - Dietary Fiber
- ▶ - Chitin
- ▶ - Guar Gum
- ▶ - Garcinia cambogia (Rind of Brindell Berry)
- ▶ - Conjugated Linoleic Acids
- ▶ - Teas (Camellia sinensis)
- ▶ - Green Tea
- ▶ - Caffeine
- ▶ - L-Carnitine
- ▶ - Green Coffee
- ▶ Chromium

Dietary Fiber

- ▶ High fiber intake has been associated with lower body mass index (BMI) and enhanced weight loss and weight maintenance.
- ▶ Fibers decrease the energy density of foods.
- ▶ Soluble fibers exert a hygroscopic effect, by which they slow absorption of energy-dense macronutrients

Psyllium

- ▶ Psyllium, one of the **water-soluble fibers**, is derived from blonde psyllium seeds; it ferments slowly, helps build up fecal mass
- ▶ **Psyllium supplementation (up to 3.5 g per meal)** may have significant beneficial effects on body composition changes in obese individuals, which include BMI and waist circumference, while causing minimal or no abdominal discomfort

Psyllium

- ▶ It also reduces **fasting glucose, total cholesterol levels, low-density lipoprotein (LDL) cholesterol, and triglycerides**, while improving **insulin sensitivity** and **increasing high density lipoprotein (HDL) cholesterol levels**
- ▶ It may be ideal for an overweight person with **metabolic syndrome**

Psyllium

- ▶ psyllium supplementation at doses **higher** than **3.5 g per meal** does **not have** these effects on body composition in obese individuals.
- ▶ Higher doses of psyllium and overall fiber intake per meal (>3.5 g per meal) are associated with significant **abdominal discomfort**



Konjac Root

- ▶ Konjac, a plant found in Asia, especially India, Japan, and Korea, has been used in Asian cuisine
- ▶ Konjac flour is used as a food stabilizer, gelling agent, and supplement.
- ▶ It is the root, which contains a **highly soluble fiber called glucomannan**, which studies have shown may enhance weight loss and improve lipid profiles



- ▶ **2–4 g of glucomannan daily was well tolerated** , can absorb up to 50 times its weight in water, and led to improved blood lipid profiles.
- ▶ There is some evidence that glucomannan exerts its beneficial effects by promoting **satiety, lowering energy density, delaying gastric emptying,** and **reducing fat absorption in the intestines,** which may lead to more fecal energy loss.

Chitin

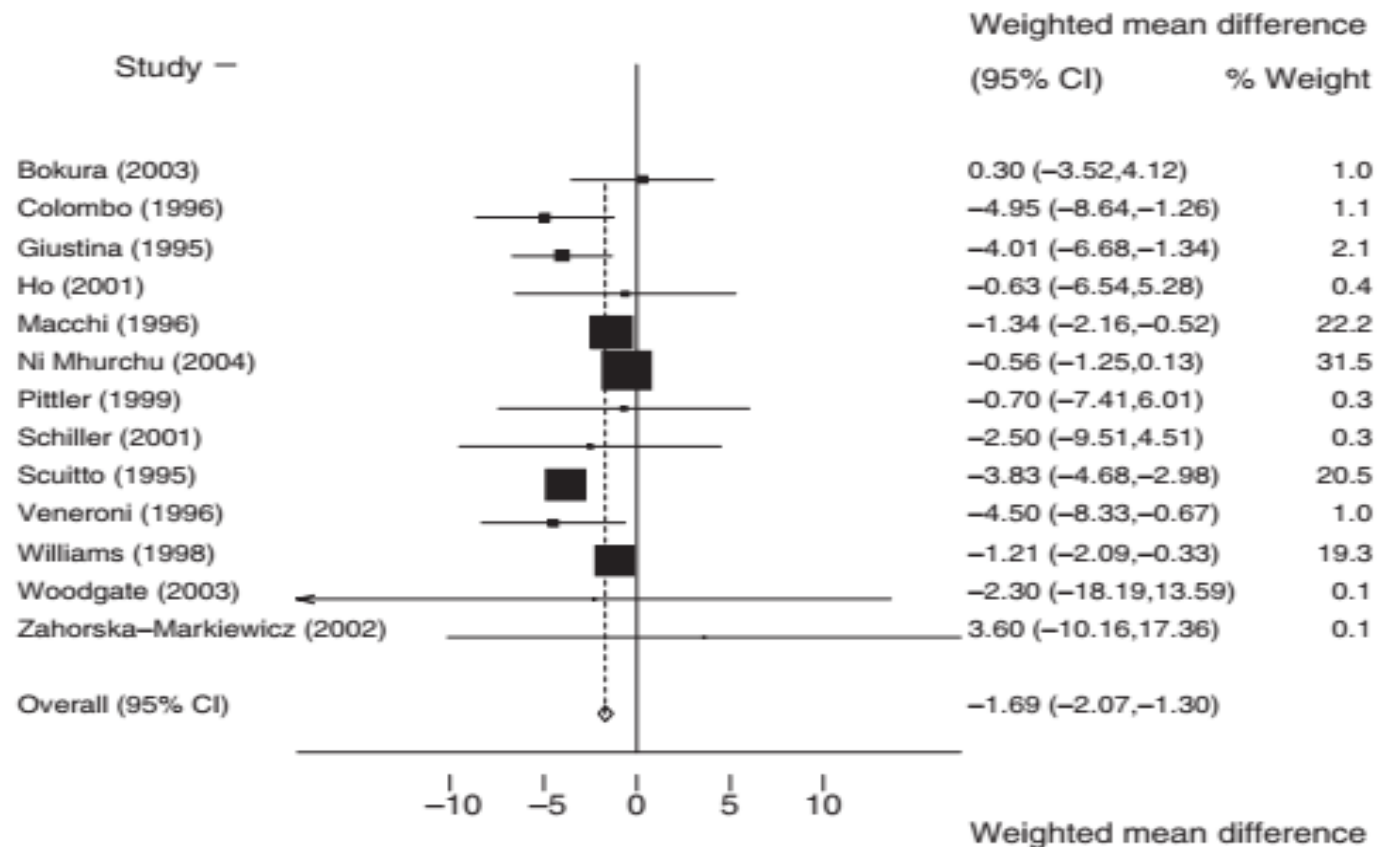
- ▶ Chitin is component of crab, shrimp, and lobster shells and thus abundantly available in nature.
- ▶ Like dietary fiber, chitin is a polysaccharide that is **indigestible** by the human gut.
- ▶ Chitosan is deacetylated chitin. In rats, chitosan has been shown to decrease hepatic cholesterol and increase bile acid and fat excretion



- ▶ There are not sufficient human studies to prove a beneficial effect of chitosan for weight loss.

- ▶ One meta analysis reviewed 14 studies that tested the effect of chitosan on weight loss and concluded that it causes a small net effect of approximately 1.7 kg .

Analysis of change in body weight – all trials



White kidney beans Extract



White kidney beans Extract

- ▶ White kidney beans are legumes also referred to as *Phaseolus vulgaris*, and more commonly, cannellini beans.
- ▶ They are rich in an active constituent called phaseolamin which has been clinically shown to promote weight loss.
- ▶ It has been implicated for improving blood-lipid profiling and possibly reducing the risk factors for coronary artery disease and heart disease.

White kidney beans Extract

- ▶ Phaseolamin acts to partially block the digestion of starchy foods with **high glycemic** indices like lasagna, macaroni salad and bread.
- ▶ By limiting the amount of carbohydrates that are assimilated into the bloodstream, the total amount of metabolized glucose is reduced.
- ▶ Phaseolamin suppress *alpha-amylase digestive action*

Reported Results of White Kidney Bean

- ▶ When alpha-amylase is blocked by White Kidney Bean diet pills, the carbohydrates that are inhibited from digestion are either expelled in undigested form, or they are digested via fermentation in the colon.

Reported Results of White Kidney Bean

- ▶ A review of six clinical trials of white kidney bean extract with no other weight loss ingredient in daily doses of between 445 mg and 1,500 mg per day found a statistically significant **reduction in body fat** (averaging about 4 pounds) when compared to placebo, although there was insufficient evidence to demonstrate weight loss.

Is White Kidney Beans Safe?

- ▶ The FDA has classified *Phaseolus vulgaris* as a GRAS food and no serious side effects have been reported or observed in clinical trials.
- ▶ In some cases, **gastrointestinal disturbances** occur including gas, bloating and stomach upset. However, these effects are always fast to pass and mild in severity.
- ▶ White kidney bean extracts are known to affect blood glucose levels. They act to lower blood sugar and to inhibit the sharp glucose spikes that many experience after eating carbohydrate-heavy meals.

Guar Gum

- ▶ Guar gum is derived from the Indian cluster bean (*Cyamopsis tetragonolobus*) and is known to exert its action via imparting postprandial fullness and increasing bowel viscosity, which in turn may result in reduced appetite, lower food intake, and improved satiety.
- ▶ Reduced appetite and higher satiety may have an impact on weight loss in obese individuals via lower energy intake; however, evidence from studies on the effects of **guar gum supplementation indicate that it may not help in weight loss.**

- ▶ One meta-analysis of randomized controlled trials concluded that it had no significant effects on weight changes in obese individuals
- ▶ In summary, studies on dietary fiber supplements do not provide strong evidence that they may support weight loss.
- ▶ The mechanism may induce weight loss includes increased satiety, reduced appetite, and blockage of dietary fat absorption

Garcinia cambogia (Rind of Brindell Berry)



Garcinia cambogia (Rind of Brindell Berry)

- ▶ *Garcinia cambogia*, a tropical fruit also known as the Malabar tamarind, is a popular weight-loss supplement.
- ▶ People say it blocks body's ability to make fat and it puts the brakes on appetite.

How It Works

- ▶ The active ingredient in the fruit's rind, **hydroxycitric acid**, or **HCA**, has boosted fat-burning and cut back appetite in studies.

- ▶ It appears to block an enzyme called citrate lyase, an extra-mitochondrial enzyme that may inhibit de novo lipogenesis and reduce appetite in some in vivo studies.

Garcinia cambogia

- ▶ In some analyzed works, there was observed that the GC showed positive effects on weight loss process, appetite reduction, body fat percentage, triglycerides, cholesterol and glucose levels, lipogenesis process, while others had no effect.
- ▶ **Daily Recommended Amount: 1500 to 3000 mg/day**

Proposed mechanisms

How Does Garcinia Cambogia Work?

Unused energy or glucose is converted into fat deposits in the body by specific enzymes, creating weight gain.



HCA (Hydroxycitric Acid) found in Garcinia Cambogia prevents formation of fat by blocking those enzymes.



Your body then breaks down these stored fat cells, resulting in increased metabolism & fat burning.



HCA also increases serotonin levels in the brain, therefore limiting your appetite & boosting your energy.



Fat Burner

Hydroxycitric Acid (HCA) blocks the enzyme adenosine triphosphate-citrate (pro-3S)-lyase, from converting unused energy into fat.

This results in preventing fat production and increasing energy at the same time.

Appetite Suppressant

The natural HCA in Garcinia Cambogia increases brain serotonin levels, a neurotransmitter involved in appetite control, which reduces emotional food cravings and decreases the urge to consume calories.

Mood Enhancer

HCA also helps manage your stress hormones (cortezole), which further prevents emotional issues like emotional over-eating, binge-eating, mood disorders, and helps to provides better sleep habits.

Main results of non-randomized studies with supplementation of *Garcinia cambogia*/HCA

<i>Duration of the study</i>	<i>Participants</i>	<i>Treatment</i>	<i>Result</i>	<i>References</i>
16 weeks	20 rats divided in two groups of 10	Group 1: HFD (45% LIP, 20% PROT e 35% HC) without supplementation; Group 2: HFD + supplementation of GC (1%, kg/weight)	GC protected against obesity induced by HFD through the modulation of the synthesis of fatty acids and β -oxidation, but induced hepatic fibrosis, inflammation and oxidative stress.	[24]
12 weeks: 1st to 8th week (period of induction); 8 th to 12 th (period of treatment)	32 rats divided in three groups: group 1 (8 rats), group 2 (8 rats) and group 3 (16 rats)	Group 1: control (normal diet during the whole study); Group 2: HFD (35% LIP) until the 8 th week, subdivided in two groups from the 8 th to the 12 nd week: one group with GC 50mg/day + HFD and other with HFD; Group 3: HSD (65% of sucrose) until the 8 th week, subdivided in two groups from the 8 th to the 12 nd week: one group with GC 50 mg/day + HSD and other with HSD.	The HFD and HSD groups showed a significant increase in feed intake, BW, BMI, TG, LDL, oxidative stress and renal disorder, while the groups supplemented with GC showed improvement of the harmful effects of HFD and HSD diets, with consequent reduction of feed intake, increase of the MDA level and decreased oxidative stress in renal tissue.	[25]
10 weeks	30 rats divided in three groups of equal numbers	Group 1: control (basal diet 2% of liquid vegetable oil and 0% of cholesterol); Groups 2 and 3: diets 2% of liquid vegetable oil, 5% of hydrogenated vegetable oil and 3% of cholesterol. Group 3 received 2390 mg/day of GC from day 45 on.	The supplementation of the GC HFD failed to reduce the rising levels of serum lipids.	[26]
16 weeks	C57BL/6J mice prone to obesity	Mice were fed with HFD (45% LIP) with and without CG (1% kg/weight).	High intakes of HCA alone did not lead to signs of inflammation or hepatotoxicity.	[20]

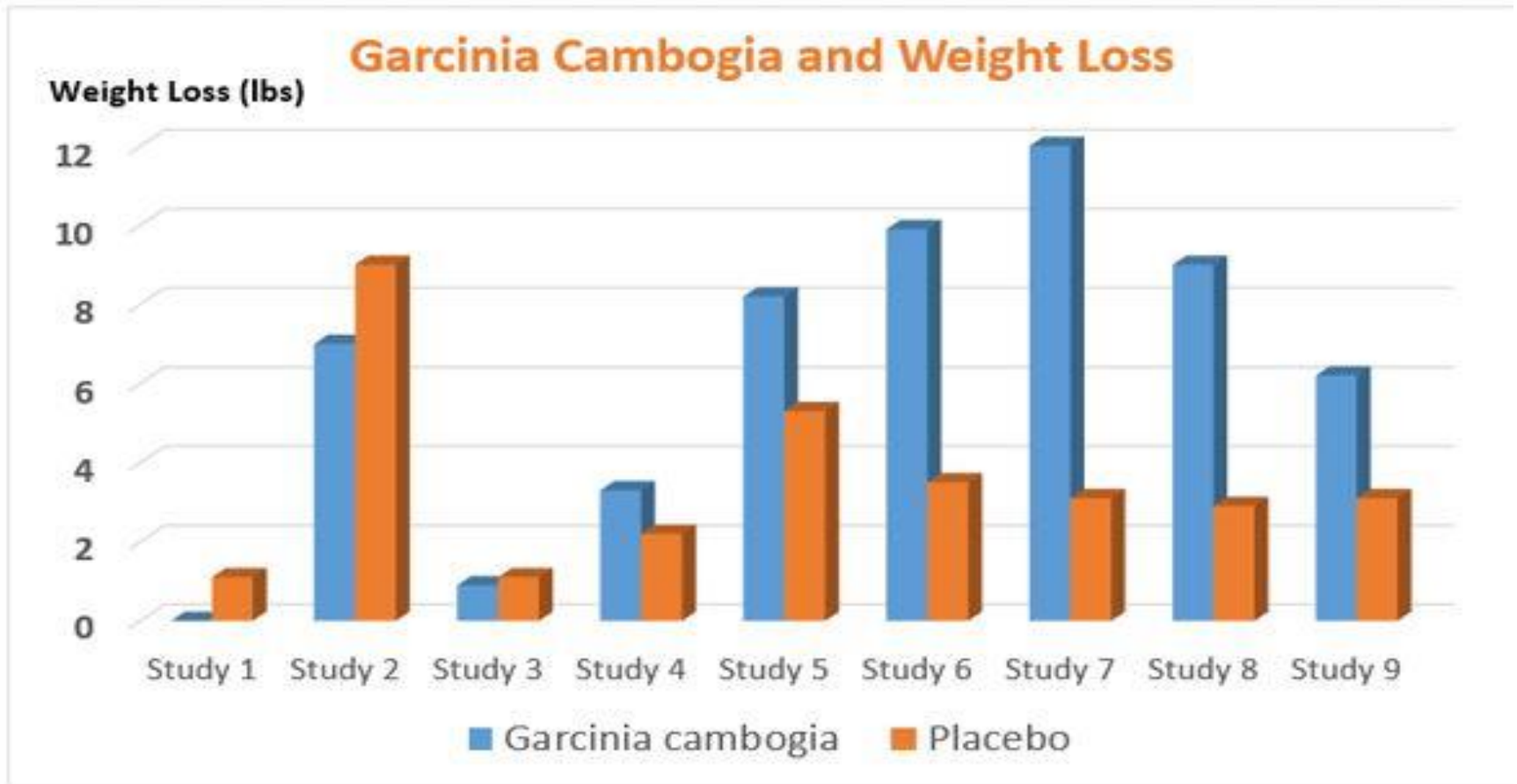
*HFD = High Fat Diet; LIP = Lipids, PROT = Proteins, CHO = Carbohydrates, GC = *Garcinia Cambogia*, HSD = High Sucrose Diet; BW = Body Weight; BMI = Body Mass Index, TG = Triglycerides, LDL = Low-Density Lipoprotein, MDA = Malondialdehyde (a marker for oxidative stress); HCA = Hydroxycitric Acid.

Main results of randomized studies with *Garcinia Cambogia* supplementation/HCA

<i>Duration of the study</i>	<i>Participants</i>	<i>Treatment</i>	<i>Result</i>	<i>References</i>
10 weeks	86 subjects (46 M and 40 W) ranging from 20 to 50 years old, overweight (BMI > 23 and < 29) randomly divided into three groups.	Group 1: use of pills with Glycinemax extract (EGML 2 g/day); Group 2: Intake of GC extract (GCE 2 g/day) Group 3: placebo (starch 2 g/day).	EGML and GCE did not promote BW loss neither decreased the TC in overweight individuals consuming usual diet. EGML increased levels of HDL-C. There were no serious adverse effects reported by the intake of EGML, GCE or placebo (starch).	[15]
18 weeks	48 W postmenopausal, healthy, normal biochemical exams, between 50 and 70 years, BMI between 25 and 39.9 divided into three groups.	Group 1: 2800 mg/day GC; Group 2: 5600 mg/day of GC; Group 3: Control (placebo = 12 capsules totaling 4080 mg/day palm oil).	No significant effects were observed with the administration of the GC dosages or adverse effect level (NOAEL) in humans at doses of 4000mg/day.	[14]
1 week	8 healthy men aged 22+ 0.3 years.	After 60 min of cycling exercise at 70-75% VO _{2max} received 500mg of HCA with a meal high in (CHO 80%, 8% LIP, 12% PROT).	The supplementation of HCA enhances the rate of glycogen synthesis in human skeletal muscle and improves the postprandial insulin sensitivity.	[27]
8 weeks	20 practitioners of regular physical activity separated into two groups of 10 members.	Group 1: normocaloric diet; Group 2: normocaloric diet + 2 capsules of 500 mg/day GC.	The combination of diet and physical activity remains the most suitable for positive changes in body composition.	[2]
10 days	10 men, sedentary, lean (BMI: 21.8 + 2.1 kg/m ²) and aged 24+ 5 years.	3 days of diet rich in fat (60% LIP, 25% HC, 15% PROT) and 7 days diet rich in HC (5% LIP, 85% HC, 10% PROT) supplemented with 3 capsules of 500 mg/day HCA.	The treatment with HCA during overfeeding with carbohydrates can reduce DNL.	[28]

*H = men; W = Women; BM = Body Mass Index; EGML = Glycine max leaves extract; GC = *Garcinia Cambogia*; GCE = *Garcinia Cambogia* Extract; BW = Body Weight; TC = Total Cholesterol; HDL-c = High Density Lipoprotein; HCA = Hydroxycitric Acid; CHO = Carbohydrates, LIP = Lipids; PROT = Proteins, DNL = De novo Lipogenesis.

This graph summarizes the weight loss results from nine studies on garcinia cambogia



Side effects and contraindications

- ▶ In animal studies prolonged use of GC in the administered dose in rats can cause **hepatotoxic effects and even develop non-alcoholic hepatic steatosis** because of the accumulation of collagen in the liver, independently of being caused by hyperlipidic diet.
- ▶ Some researchers claims that there are a growing number of reports of **hepatotoxicity** caused by supplements containing HCA.

Possible Side Effects

- ▶ Dizziness
- ▶ Dry mouth
- ▶ Headache
- ▶ Upset stomach or diarrhea

Side effects and contraindications

- ▶ The review studies conducted by Chuah et al., and Chuah et al., concluded that there was not observed adverse effect (NOAEL) in dosages of GC/HCA of up to 2800 mg/day, suggesting its safety for use.

Conjugated Linoleic Acids



Conjugated Linoleic Acids

▶ Conjugated linoleic acids (CLAs) are positional and geometric isomers of linoleic acid, a polyunsaturated fatty acid. CLAs are available in the *trans* and, more abundantly, in the *cis* form in meat and dairy products.

▶ **Uses of this supplement:**

- ▶ - **Cancer**
- ▶ - **Diabetes mellitus**
- ▶ - **Atherosclerosis**
- ▶ - **Immune modulation**

Food	Total CLA Content (mg/g fat)
Pasture-Raised Beef	30
Pasture-Raised Dairy	20-30
Lamb	5.6
Homogenized Milk	5.5
Buttermilk	5.4
Mozzarella Cheese	4.9
Plain Yogurt	4.8
Butter	4.7
Sour Cream	4.6
Cottage Cheese	4.5
Ground Beef	4.3
Cheddar Cheese	4.1
Ice Cream	3.6
Ground Turkey	2.5
Chicken	0.9
Pork	0.6
Egg yolk	0.6
Salmon	0.3

Source: Chin et al.

Various mechanisms of CLA on weight loss

- ▶ **CLA decreases energy intake:**
- ▶ potential mechanisms by which CLA reduces BFM include decreasing energy intake or increasing energy expenditure.
- ▶ Some animal studies demonstrated that mice supplemented with a CLA mixture or enriched 10,12 CLA for 4 weeks reduced their food intake.
- ▶ CLA had a decreased gene expression ratio of proopiomelanocortin to neuropeptide Y (NPY) in the hypothalamus.

CLA increases energy expenditure

- ▶ Enhanced thermogenesis may be associated with an **upregulation of uncoupling proteins (UCPs)**, which facilitate proton transport over the inner mitochondrial membrane, thereby diverting energy from ATP synthesis to heat production.
- ▶ Supplementation with a CLA mixture for 13 weeks increased the resting metabolic rate and fat-free mass in human subjects without a corresponding effect on BFM

CLA inhibits adipogenesis

- ▶ There is much evidence showing that CLA suppresses preadipocyte differentiation in animal and human
- ▶ 10,12 CLA treatment has been reported to reduce adipogenesis and lipogenesis
- ▶ **CLA suppresses lipogenesis**
- ▶ **CLA stimulates lipolysis**

Main results of CLA RCTs

First author year	CLA daily dosage and formulation	Randomized/ analyzed	Age (years)	Body weight at baseline (kg)	Treatment duration (months)	Main results; reported as means with standard deviations	Adverse events (AE)
Gaullier [20]	3,400 mg c9,t11	118/105	48.7 ± 9.2 (CLA) 45.8 ± 10 (PLA)	88.2 ± 9.7 (CLA) 87.4 ± 9.8 (PLA)	6	Mean weight loss was 0.9 ± 3.9 kg and 0.0 ± 3.3 kg for CLA and PLA groups, respectively	Constipation, diarrhea, myocardial infarction
Gaullier [21] ^a	4,500 mg Unspecified	180/180	44.5 ± 10.7 (CLA-F) 48.0 ± 10.7 (CLA-T) 45.0 ± 9.5 (PLA)	81.0 ± 9.3 (CLA-F) 80.7 ± 9.5 (CLA-T) 80.1 ± 9.4 (PLA)	12	Mean weight loss was 1.1 ± 3.7 kg, 1.8 ± 3.4 kg, and 0.2 ± 2.9 kg for CLA-F, CLA-T, and PLA groups, respectively	Musculoskeletal ailments, gastrointestinal symptoms
Larsen [22]	3,400 mg c9,t11; t10,c12	101/83	18–65 for all subjects	82.6 ± 9.5 (CLA) 88.5 ± 12.0 (PLA)	12	Mean weight gain was 4.0 ± 5.6 kg and 4.0 ± 5.0 kg for CLA and PLA groups, respectively	Soft stools, stomach pain
Racine [23]	2,400 mg c9,t11; t10,c12	62/53	8.6–8.8 (CLA) 8.1–9.3 (PLA)	43.8–45.6 (CLA) 38.1 to 42.9 (PLA)	7 ± 0.5	Mean weight gain was 3.2 ± 1.9 kg and 3.7 ± 2.3 kg for CLA and PLA groups, respectively	Gastrointestinal symptoms
Sluijs [24]	4000 mg c9,t11; t10,c12	401/346	58 ± .04 (CLA) 58.8 ± 0.5 (PLA)	85.6 ± 0.9 (CLA) 85.2 ± 1.0 (PLA)	6	Mean weight gain was 0.21 ± 2.9 kg and 0.65 ± 2.1 kg for CLA and PLA groups, respectively	Gastrointestinal symptoms
Watras [25]	4,000 mg c9,t11; c10,t12	48/40	34.0 ± 8.0 (CLA) 32.0 ± 7.0 (PLA)	80.0 ± 9.1 (CLA) 79.0 ± 10.9 (PLA)	6	Mean weight loss was 0.6 ± 2.5 kg in CLA; mean weight gain was 1.1 ± 3.2 kg for PLA	No significant AE relating to trial participation
Whigham [26] ^b	6,000 mg c9,t11; c10,t12	64/50	43.4 ± 4.8 (CLA) 41.2 ± 5.9 (PLA)	93.4 ± 13.8 kg (CLA) 91.4 ± 12.5 kg (PLA)	7	No significant differences in body composition between CLA and PLA	AE were lower in the CLA group compared to PLA

CLA conjugated linoleic acid, CLA-F CLA-free fatty acids, CLA-T CLA-triacylglycerols, PLA placebo, c,t cis-,trans-isomers

^a Study was a 3-arm trial and had two variations of CLA compared against PLA; each CLA group was compared with the PLA group in the meta-analyses

^b Study was 12 months in duration but was only double-blinded for the first 7 months

Adverse events

- ▶ **CLA increases inflammation :**

- ▶ Treatment with 10,12 CLA has also been shown to increase the expression or secretion of IL-6 and IL-8 from murine and human adipocyte cultures, as well as TNF α

- ▶ **CLA causes insulin resistance :**

- ▶ CLA may inhibit insulin signaling by 1) activating inflammatory pathways and stress kinases, and 2) downregulating expression of genes involved in the insulin signaling and glucose uptake pathways

Adverse events

- ▶ - Diarrhea
- ▶ - Soft stools
- ▶ - Stomach pain
- ▶ - Musculoskeletal symptoms
- ▶ - Myocardial infarction

What's the research say?

- ▶ A lot of the research on vinegar's relationship with weight loss is in animals, mainly mice and rats.
- ▶ Studies show that acetic acid, the main component of apple cider vinegar, can suppress body fat accumulation and metabolic disorders in obese rats

Curcumin



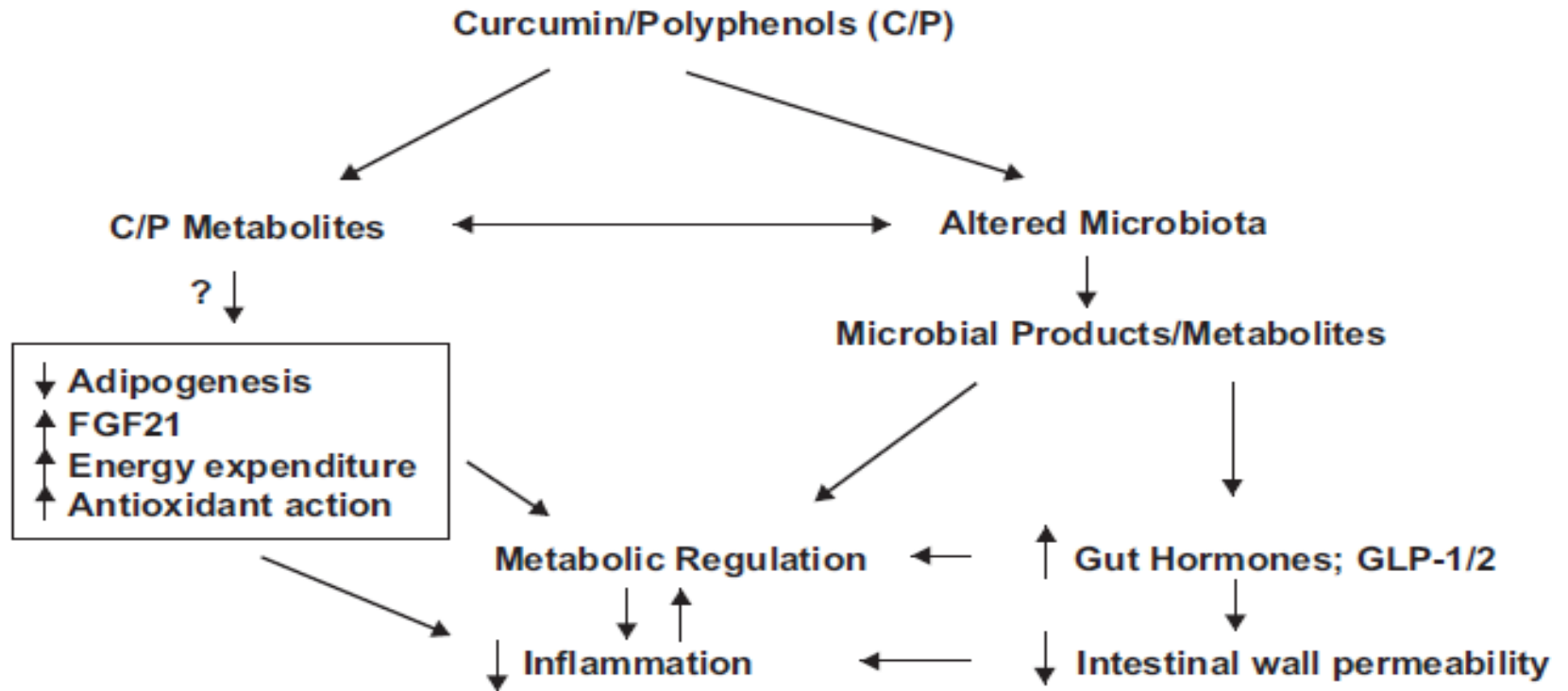
- ▶ In *Curcuma longa*, crude extract curcuminoid makes up **1–6% of turmeric by weight.**
- ▶ **(averaging 3.14% by weight)**

مقاله

اثر ضد چاقی و ضد دیابتی کورکومین

Am J Physiol Endocrinol Metab 314: E201–E205, 2018.

First published October 31, 2017; doi:10.1152/ajpendo.00285.2017



The Effects of Curcumin on Weight Loss Among Patients With Metabolic Syndrome and Related Disorders: A Systematic Review and Meta-Analysis of Randomized Controlled Trials //

published: 12 June 2019

▶ **Results:** Eighteen articles (21 studies) that comprised a total of 1,604 individuals were finally included in the meta-analysis. Curcumin intake significantly reduced body mass index (BMI) (SMD -0.37 ; 95% CI, -0.61 , -0.13 ; $P < 0.01$), weight (SMD -0.23 ; 95% CI, -0.39 , -0.06 ; $P < 0.01$), waist-circumference (WC) (SMD -0.25 ; 95% CI, -0.44 , -0.05 ; $P = 0.01$), leptin levels (SMD -0.97 ; 95% CI, -1.18 , -0.75 ; $P < 0.001$) and increased adiponectin levels (SMD 1.05 ; 95% CI, 0.23 , 1.87 ; $P = 0.01$). We found no significant effect of curcumin intake on hip ratio (HR) (SMD -0.17 ; 95% CI, -0.42 , 0.08 ; $P = 0.18$).

▶ **Conclusions:** curcumin intake among patients with metabolic syndrome and related disorders was correlated with a

significant reduction in :

BMI, weight, WC, and leptin

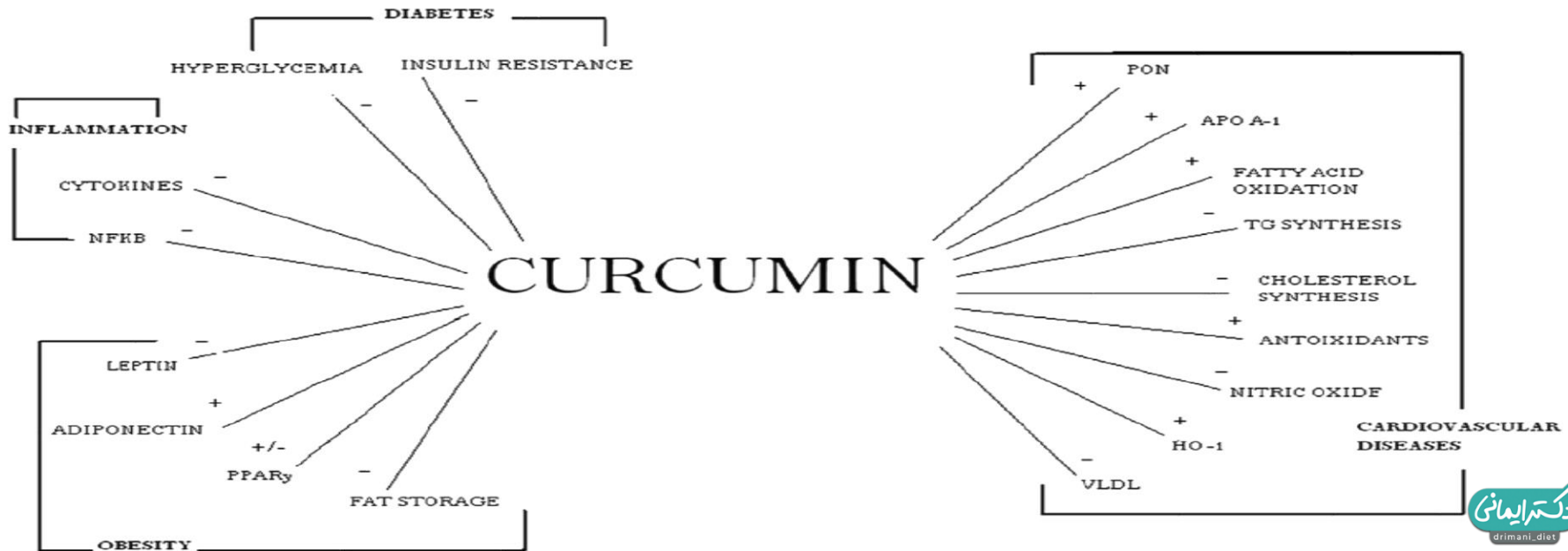
significant increase in :

adiponectin levels, but did not affect HR

Curcumin modulates pathways responsible for obesity-related complications // 17 January 2023

Evidence suggests :

curcumin may regulate lipid metabolism, which plays a central role in the development of obesity and its complications



Moringa



- ▶ **Moringa leaves are high in antioxidants including chlorogenic acid, which aids weight loss.**
- ▶ It acts as a fat burner and helps to normalize blood sugar levels.

▶ Per 3.5 ounces (100 grams), moringa leaves contain approximately :

- **Protein:** 27 grams
- **Fat:** 6 grams
- **Fiber:** 34 grams
- **Sugar:** 3 grams
- **Sodium:** 1,361 mg
- **Calcium:** 173% of the Daily Value (DV)
- **Iron:** 133% of the DV
- **Zinc:** 27% of the DV
- **Magnesium:** 126% of the DV
- **Copper:** 111% of the DV
- **Vitamin A:** 176% of the DV

Published online 2021 Mar 3. doi: [10.1016/j.sjbs.2021.02.078](https://doi.org/10.1016/j.sjbs.2021.02.078)

PMID: [34121870](https://pubmed.ncbi.nlm.nih.gov/34121870/)

Moringa peregrina leaf extracts produce anti-obesity, hypoglycemic, anti-hyperlipidemic, and hepatoprotective effects on high-fat diet fed rats

[Dalal A. Alkudhayri](#), [Magdi A. Osman](#),* [Ghedeir M. Alshammari](#), [Salah A. Al Maiman](#), and [Mohammed Abdo Yahya](#)

Nutritional Comparison



Moringa Compared to 100gm. Edible Portion of Common Foods

from *Nutritive Value of Indian Foods* by C.Gopalan, et al.

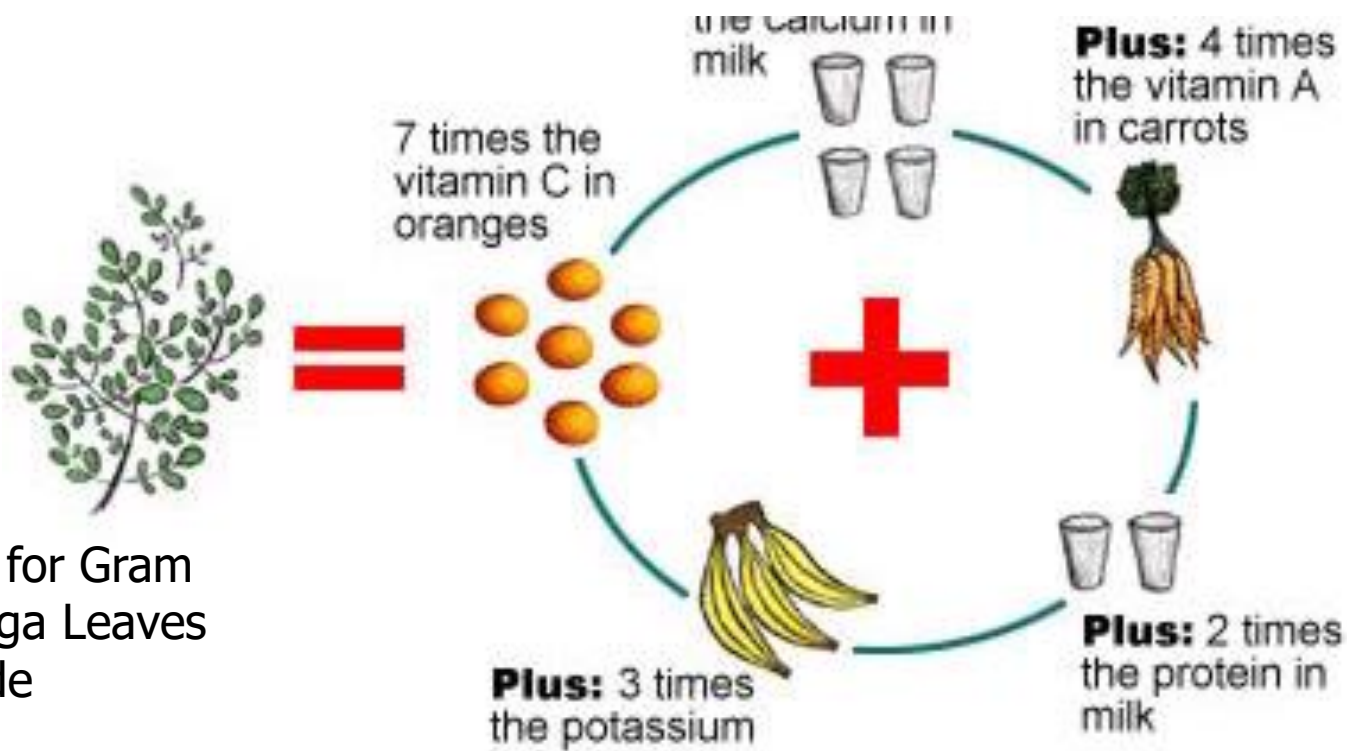
Nutrient	Moringa	Other Foods
Vitamin A	6780 mcg	Carrots: 1890 mcg
Vitamin C	220 mg	Oranges: 30 mg
Calcium	440 mg	Cow's milk: 120 mg
Potassium	259 mg	Bananas: 88 mg
Protein	6.7 gm	Cow's milk: 3.2 gm

As you can see, the Moringa tree is a powerful source of vitamins.





Leaves: Nutritional Supplement



Gram for Gram
Moringa Leaves
Provide




RESEARCH

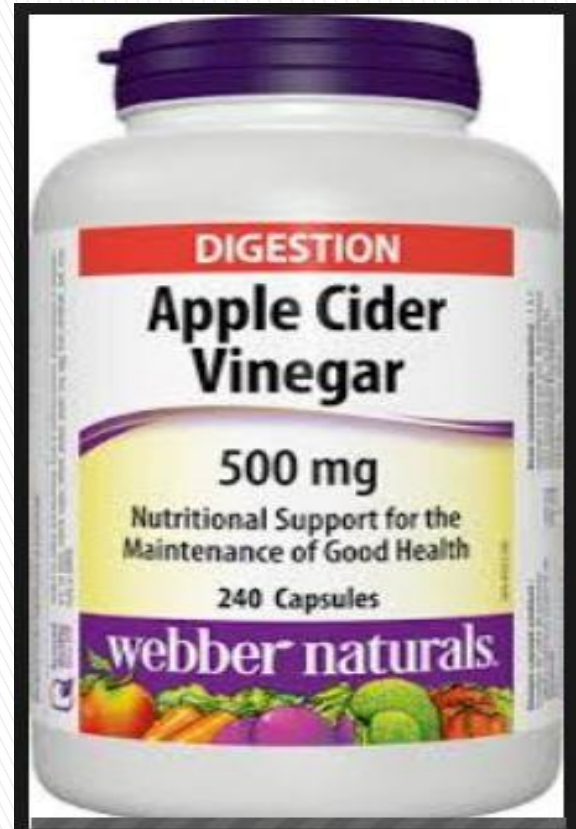
Open Access

Combined extracts of *Moringa oleifera*, *Murraya koeingii* leaves, and *Curcuma longa* rhizome increases energy expenditure and controls obesity in high-fat diet-fed rats



Sreenath Kundimi¹, Krishna Chaitanya Kavungala¹, Swaraj Sinha¹, Venkata Narasimha Rao Tayi¹, Nagendra Rao Kundurthi¹, Trimurtulu Golakoti¹, Barbara Davis² and Krishanu Sengupta^{1*} 

Apple Cider Vinegar



Apple Cider Vinegar

- ▶ It's mostly apple juice, but adding yeast turns the fruit sugar into alcohol -- this is fermentation.
- ▶ Bacteria turn the alcohol into acetic acid. That's what gives vinegar its sour taste and strong smell.

Human studies

- ▶ Studies in humans have been small, which limits their validity.
- ▶ some research suggests that it might promote satiety and make you consume fewer calories throughout the day
- ▶ A 2005 study of 12 people found that to be true when vinegar was consumed with a bread meal.

Human studies

- ▶ The most-cited study to prove a connection to weight loss was done in 2009 with 175 "obese" Japanese subjects, ages 25 to 60, who were split into three groups. Considered "obese" by Japanese standards, each subject's BMI was between 25 and 30; in the United States, people aren't considered obese until their BMI exceeds 30. Anyone who had high cholesterol or diabetes or was using medications was excluded.

Human studies

- ▶ Over a 12-week period, the groups consumed a beverage that contained either one tablespoon of vinegar, two tablespoons of vinegar or no vinegar at all.
- ▶ At the end of the three months, those who consumed any amount of vinegar had a lower body weight, a smaller body mass index, less visceral fat, a smaller waist measurement and lower triglyceride levels than the placebo group that drank no vinegar.

How It Works

- ▶ Acetic acid appears to interfere with **enzymes that break down starch** molecules.
- ▶ Acetic acid is doing is blocking the absorption of starch
- ▶ It's possible that blocking starch absorption may help with weight loss as well

Green Tea



Green Tea

- ▶ The main active polyphenolic compounds found in green tea preparations are (–)-catechin gallate (CG), (–)-gallocatechin gallate (GCG), (–)-epicatechin gallate (ECG), and (–)-epigallocatechin gallate (EGCG); caffeine; proanthocyanidins; and flavonols (myricetin, caempferol, quercetin)

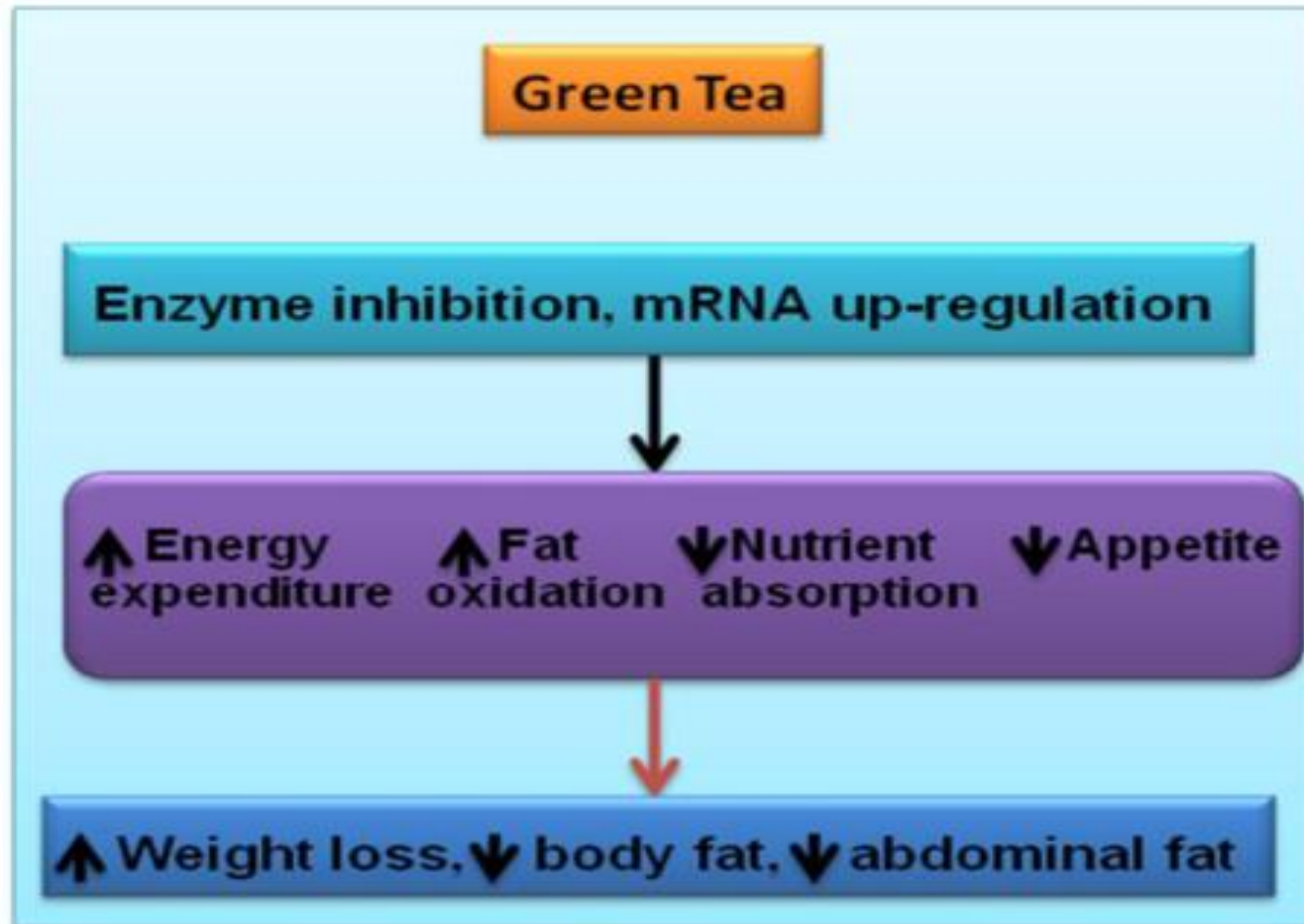
Green Tea

- ▶ The results related to weight control benefits are more mixed, although multiple studies have shown that catechin-rich (>500 mg/d) green tea significantly reduces body weight and fat.
- ▶ **several possible mechanisms: increase in energy expenditure, fat oxidation, and suppression of the lipogenic enzyme fatty acid synthetase, thereby inhibiting lipogenesis.**

Green Tea

- ▶ One study suggested that low habitual intake of catechin from green tea and caffeine together (270 mg green tea catechin and 150 mg caffeine per day) may assist in weight maintenance after weight loss.

Proposed anti-obesity mechanisms of green tea



Results of meta -analysis

- ▶ Green tea preparations appear to induce a small, statistically **non-significant** weight loss in overweight or obese adults.
- ▶ Because the amount of weight loss is small, **it is not likely to be clinically important.**
- ▶ Green tea had no significant effect on the maintenance of weight loss.
- ▶ Of those studies recording information on adverse events, only two identified an adverse event requiring hospitalization.
- ▶ The remaining adverse events were judged to be mild to moderate.

Caffeine

- ▶ On average, 100 mg of caffeine is present in one 8-oz cup of coffee
- ▶ One study assessed the effect of caffeine intake on body weight in a 12-year prospective study and concluded that an increase in caffeine intake led to reduced weight gain over a period

Various mechanisms have been proposed to explain caffeine-induced weight loss

- ▶ One of them is thermogenesis
- ▶ Caffeine consumption has been shown to increase the energy expenditure by about 150 kcal in lean subjects and 79 kcal in obese subjects, thereby playing significant role in weight loss
- ▶ Caffeine also causes oxidation of fat, thereby stimulating the metabolic rate, thus making lipolysis a mechanism of weight loss.

Adverse Effects

- ▶ Higher consumption of caffeine (>300 mg/d), including tremors, insomnia, and dizziness.
- ▶ findings indicate that caffeine, when consumed in a limited amount (<300 mg/d) and in combination with other polyphenols, can be an adjunct to weight loss

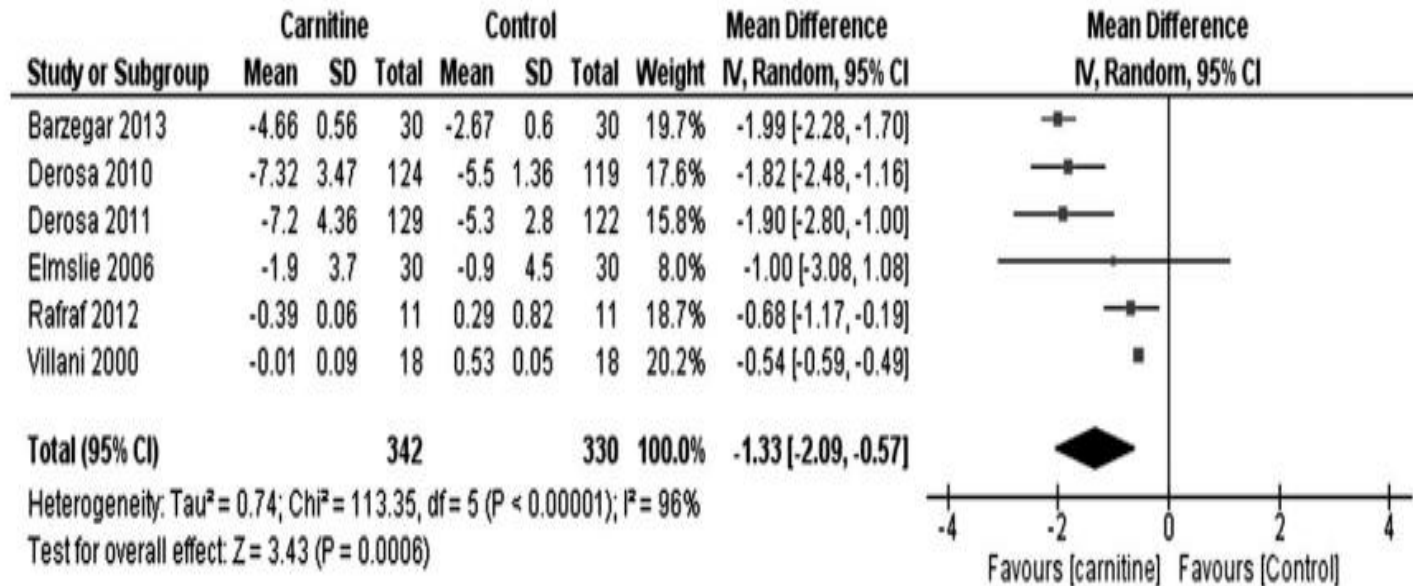
L-Carnitine



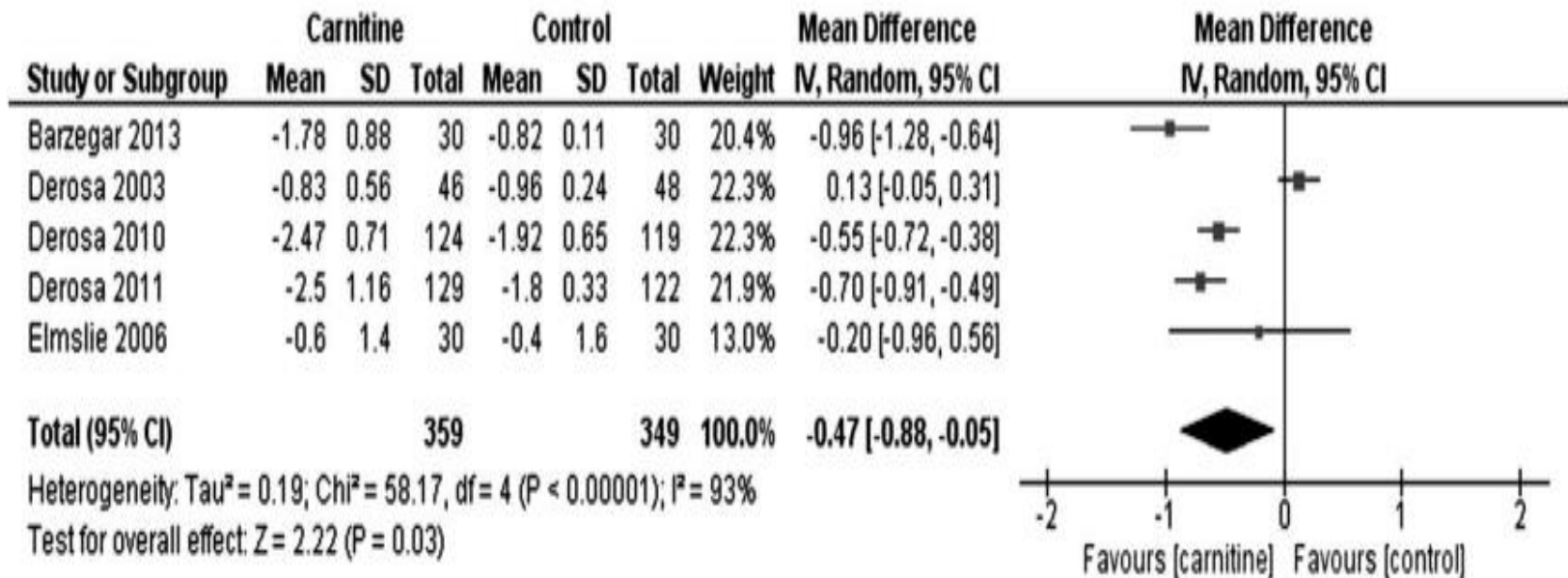
L-Carnitine

- ▶ In normal healthy adults, L-carnitine supplementation (1g/3 times a day) has shown to significantly increase fatty acid oxidation, suggesting it may help in weight loss

Forest plot of weight change outcome after L-carnitine intake



Forest plot of body mass index (BMI) change outcome after L-carnitine intake



L-Carnitine

- ▶ Results of meta-analysis have shown that receiving the Carnitine **resulted in weight loss**
- ▶ Effective dose: **2 to 3 gram/day**
- ▶ There is no evidence of any adverse effects of L-carnitine supplementation

Risks of Side Effects

- ▶ L-carnitine products are considered safe for most individuals to take. Using this supplement in excessive dosages could lead to adverse effects
- ▶ If taken for weight loss, the suggested dosage is between 1,000 mg to 5,000 mg.
- ▶ The recommended dosage that individuals should take for weight loss varies based on age, health and other factors.

Risks of Side Effects

- ▶ Diarrhea
- ▶ Skin rash
- ▶ Fish-like body odor
- ▶ Increased appetite

L-Carnitine

- ▶ Those who take certain medications, such as blood thinners, thyroid hormones, valproic acid and doxorubicin
- ▶ Pregnant women should not take this supplement due to a lack of evidence on the safety of these supplements for women in this condition. These supplements are possibly safe for lactating women
- ▶ Some of the conditions that might be affected by use of this supplement include high blood pressure, diabetes, cirrhosis, kidney disease, peripheral vascular disease and seizures

Green Coffee



Green Coffee

- ▶ Green coffee extract is derived from green unroasted coffee beans and has been marketed in both decaffeinated and caffeinated forms.
- ▶ Within its bioactive substances, it contains chlorogenic acid, a polyphenol from the subfamily of phenolic acids

Green Coffee

- ▶ The mechanisms proposed for the effects of green coffee extract on weight loss include a lipolytic effect on adipocytes as well as a decrease in pancreatic lipase activity, inhibition of fatty acid synthase, hydroxymethylglutaryl-CoA reductase, and acyl-CoA:cholesterol acyltransferase; an increase in β -oxidation; and promotion of PPAR- α expression in the liver

Green Coffee effect on weight loss

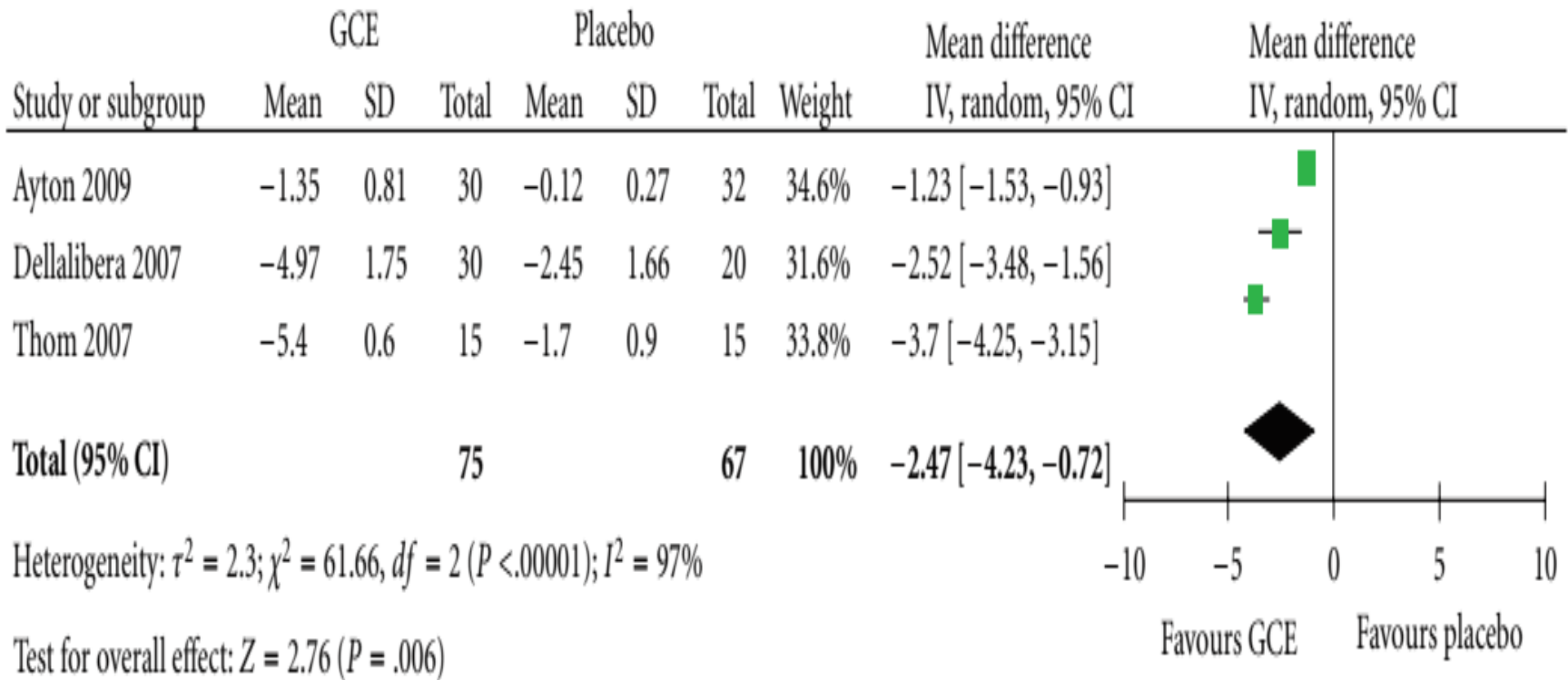
Author Year	GCE specification	No. of participants randomised	Age in yrs; Sex: M/F	Body weight at baseline	Dosage of GCE	Treatment duration	Main results; reported as means with standard deviations	Adverse events	Control for lifestyle factors
Ayton Res. 2009 (unpublished)	CGA enriched green coffee	62	Not reported	76.65 ± 7.25 kg (GCE) 77.44 ± 12.93 kg (PLA)	180 mg daily	4 weeks	Weight loss was 1.35 ± 0.81 kg and 0.12 ± 0.27 kg for GCE and PLA respectively	Not reported	Normal lifestyle
Thom 2007	CGA enriched green coffee	30	Not reported 12/18	85.2 ± 4.5 kg (GCE) 84.3 ± 4.3 kg (PLA)	200 mg daily	12 weeks	Mean weight loss was 5.4 ± 0.6 kg (GCE) and 1.7 ± 0.9 kg (PLA). Mean fat loss was 3.6 ± 0.3% (GCE) and 0.7 ± 0.4% (PLA)	No adverse events	Regular diet, normal level of exercise
Dellalibera 2007	Green coffee extract	50	Range: 19–75	Not reported	200 mg daily	12 weeks	² Mean weight loss was 4.97 ± 0.32 kg and 2.45 ± 0.37 kg for GCE and PLA, respectively	Not reported	Not reported

Abbreviation: PLA: placebo

¹ Unless otherwise specified, values are reported as means with standard deviations.

² Values reported as means with standard errors.

Green Coffee effect on weight loss



Conclusion

- ▶ A meta-analysis reported a statistically significant weight loss of almost 2.5 kg after supplementation with green coffee extract in doses ranging from 180 to 200 mg/day over a treatment period of 4 to 12 weeks

- ▶ **Adverse effects:** Not reported

Chromium



Chromium

- ▶ Chromium is thought to play a role in carbohydrate and lipid metabolism, potentially influencing weight and body composition.

Chromium

- ▶ Most weight-loss supplements use chromium picolinate in daily dosages of 200 to 400 mcg.
- ▶ The results of three RCTs that studied the role of chromium in obesity did not show any differences in weight loss between the treatment and placebo groups

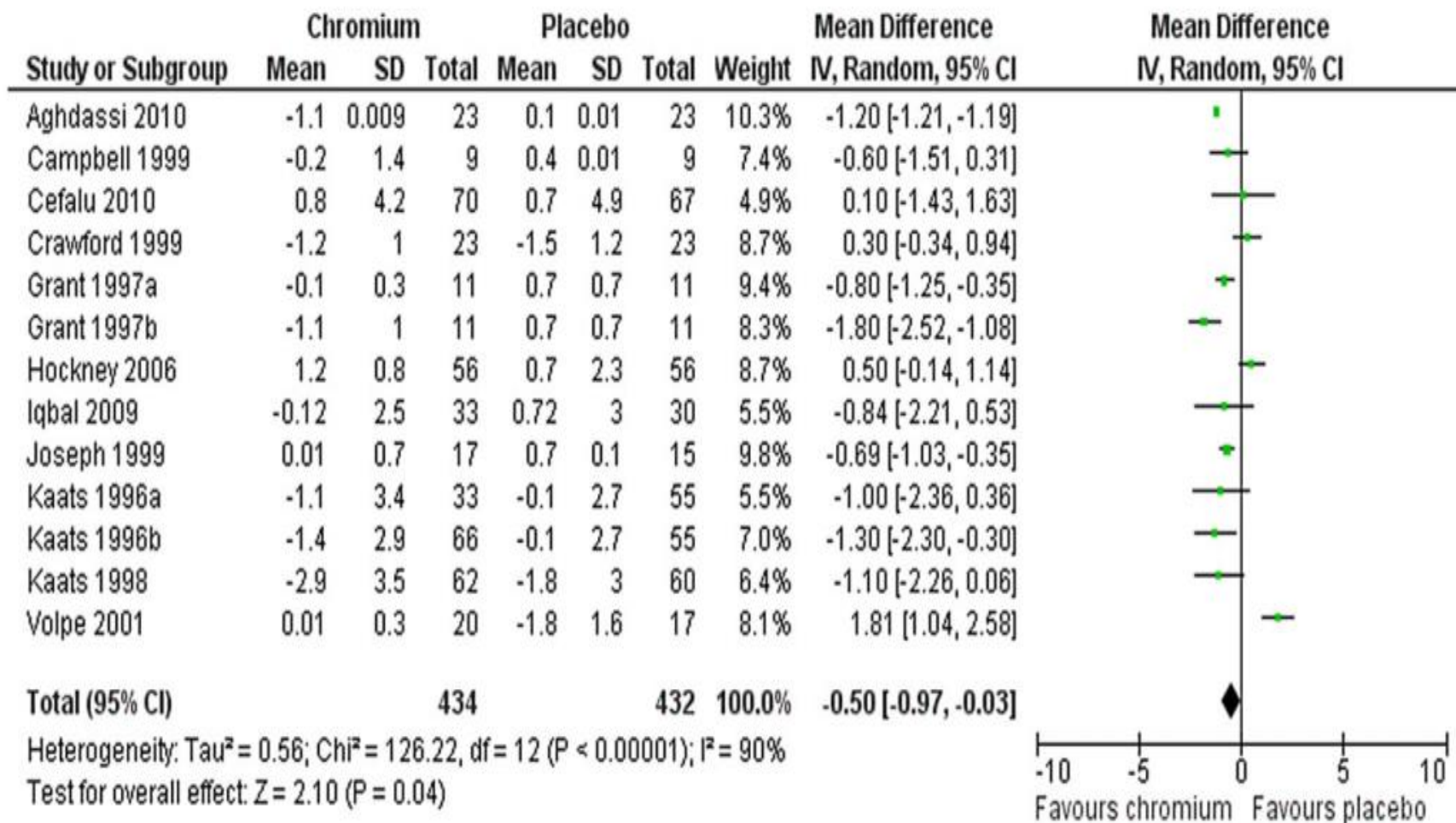


Figure 2 Effect of chromium supplementation on body weight (kg).

Conclusion

- ▶ A meta-analysis of 11 studies showed a statistically significant difference in weight loss favouring chromium over placebo
- ▶ The evidence from available RCTs shows that Chromium supplementation causes **statistically significant reductions in body weight and percentage body fat.**
- ▶ **The magnitude of these effects is small and the clinical relevance is uncertain**

Adverse events

- ▶ watery stools
- ▶ Vertigo
- ▶ Weakness
- ▶ Nausea
- ▶ Vomiting
- ▶ dizziness and headaches

Flaxseeds

- ▶ Flaxseeds are loaded with mucilage gums (soluble fiber) and lignin and cellulose (insoluble fiber)
- ▶ The soluble fiber forms a gel-like substance when it comes in contact with the digestive juices and water, which slows down the food absorption in your colon.
- ▶ This, in turn, makes you feel full for a longer time.

Results from meta-analysis

- ▶ Mohammadi et al. in a meta-analysis (2017) that evaluated 45 RCT found That supplementation of whole flaxseed for more than 12 weeks in individuals with a BMI higher than 27 may reduce body weight, BMI and WC.

مکمل لاغری ترمواسلیم چیست؟

مکمل ترموژنیک ترمواسلیم
ترمواسلیم از عصاره ۸ نوع گیاه تشکیل شده است که حاوی :

- ❖ گارسینیا کامبوجیا
- ❖ کاری
- ❖ کورکومین
- ❖ مورینگا (گزروغنی)
- ❖ کپسیکوم آنوم
- ❖ پیپرین
- ❖ کافئین آنهیدروس
- ❖ نیاسین

مکانیسم اثر ترمواسلیم در کاهش وزن :

- ❖ مهار تجمع چربی در سلول های چربی (Lipogenesis)
- ❖ تجزیه چربی در سلول های چربی (Lipolysis)
- ❖ افزایش متابولیسم بدن

THERMO SLIM



HEALTHY IS BEAUTIFUL

مکانیسم اثر ترمواسلیم در کاهش وزن :

مکانیسم اثر ترمواسلیم در کاهش وزن :

❖ مهار تجمع چربی در سلول های چربی (Lipogenesis)

❖ تجزیه چربی در سلول های چربی (Lipolysis)

❖ افزایش متابولیسم بدن



نحوه مصرف ترمواسلیم

ترمواسلیم لاغری و چربی سوزی



❖ **طریقه مصرف ورزشکاران**

دو عدد کپسول یک ساعت قبل از ورزش هوازی می باشد

❖ **طریقه مصرف غیر ورزشکاران (رژیم درمانی)**

- این مکمل دو بار در روز و هر بار یک-دو کپسول نیم ساعت قبل از صرف غذا می باشد.
- افرادی که معده حساسی دارند کپسول را با یک لیوان آب عسل رقیق میل کنند.
- جهت اثر بخشی بهتر بایستی ۳ دوره (ماه) محصول را استفاده نمایید.