

ALL NEW!

Fat-Loss Supplements... Under the Microscope

15 Expert Reviews
& Ratings on
Today's Most Popular
Fat/Weight-Loss
Supplements

by Stephen Adelé & James O'Byrne
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"SPECIAL REPORT"

CONSUMER'S GUIDE TO SUPPLEMENTS

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FAT-LOSS SUPPLEMENTS... Under the Microscope

Confused about which fat-loss supplement to use, if they're safe, or if any of them *really* even work? Finally, renowned authorities on physique development and supplement science have rated the leading "fat-fighting" supplements...

[Stephen Adele](#) and [James O'Byrne](#)

Ever wonder which supplements are "best" for burning off that dreaded, unwanted bodyfat? Call them thermogenics, fat-loss catalysts, metabolic enhancers, fat burners, or any other name... these supplements all focus on one thing: **fat loss**!

Whether you're trying to shed 30 lbs of fat, competing in a physique-transformation competition, striving to get ripped for your next vacation, or somewhere in between... here you'll find a clear-cut path. You see, we've done the work for you and thoroughly reviewed and rated the top 15 "fat-fighting" supplements to take the guesswork out of figuring out which ones work, which ones are totally worthless, and which ones are downright scams for one reason. *So you don't have to.*

This fact-filled report arms you with the type of detailed information on the latest fat-fighting aids you need to make intelligent, informed choices. You'll discover which supplements are proven and can really make a difference, which remain speculative, which remain unproven, and equally important, which ones are safe and void of potential harmful side effects.

Each supplement review will include:

- Brief overview: what is it?
- General review: how does it work?
- Expert evaluation: what does the science say about it?
- Safety: are there issues and potential side effects?
- Typical usage: how do you take it?
- Ratings: how safe and effective is it?

The way we look at it, if we can save you time from sorting through all the supplements out there, if we can save you from wasting money on supplements that just don't work, if we can guide you to the "best" supplements that will help you reach your physique-development goals—well then, we've done our job.

Our Ratings

To make it easy for you to understand each supplement, we've ranked not only the effectiveness of each supplement (which is important!), including our take on the science that supports it, but also its overall safety (which is just as important). Four stars is the highest possible ranking, and one is the worst.

Rating Scale		
Effectiveness:	★	= literally worthless
	★★	= somewhat effective
	★★★	= proven effective
	★★★★	= extremely effective
Safety:	★	= not safe
	★★	= somewhat safe
	★★★	= concluded safe
	★★★★	= proven very safe

* We've even added a special notation (next to the supplement name, in the title banner) to indicate if the supplement is not stimulating.

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NOTICE: Information provided herein is for informational purposes only and is not meant to substitute for the advice provided by a qualified physician or other medical professional. Information and statements contained herein, regarding dietary and food supplements, have not been evaluated by the Food and Drug Administration and are not intended to diagnose, treat, cure, or prevent any disease. You should not use the information contained herein for diagnosing or treating a health problem or disease. Always seek the advice of a qualified health-care practitioner prior to use of supplements if you have any pre-existing medical conditions, including high blood pressure, heart or thyroid problems, nervous disorders, diabetes, or are taking any prescription drug. Do not use supplements if pregnant or lactating. 33

CHITOSAN (chitin) *non-stimulant

What is it?

At first glance, chitosan may appear as the most appealing, miracle-cure supplement for fat loss of the century. In fact, chitosan has quickly become extremely popular among those seeking a quick fix for weight loss simply because of the bold (and outrageous) marketing claims targeted at those seeking to eat a "carefree" diet without the worry of gaining bodyfat... Claims like "block your favorite foods (like beer, pizza, donuts) from turning into fat," "eat more of the foods you crave, without putting on fat!" are just a few of the many outrageous claims made by marketers of chitosan, leading the FTC to take action against such companies. Touted as a miracle weight-loss agent, chitosan theoretically acts like a "fat sponge," absorbing fats before they can be stored. (You don't want to know what your body does with the fat then!)

How it works

Chitosan is derived from the shells of marine animals, such as crab and shrimp, and forms a fiber-like compound. When chitosan enters the stomach, it turns into a gelatin-like substance that attracts fat to it like a strong magnet: chitosan is positively charged, and fats are negatively charged, so they have a strong attraction to each other. Theoretically, because fat is bound so tightly to chitosan, the fat will remain with the chitosan as it travels through the digestive system and is eliminated from the body with the insoluble chitosan. Allegedly, chitosan attracts three to six times its weight in fats as it passes through the digestive tract, thereby helping us avoid the accumulation of bodyfat.

What does the science say?

You may be thinking this stuff sounds too good to be true, and you may be right about that. While chitosan has been shown in studies to attach to fat and lower levels of blood fats (i.e., triglycerides), it doesn't appear to really help that much, if at all, when it comes to fat loss—at least according to the human research. In addition, it's been shown to leach important nutrients, like the fat-soluble vitamins and essential fatty acids, from the body. And what's more, many past users have reported that they need to do more laundry—um, well, because chitosan may cause (how do we put this?) "anal discharge."

How to take it

Studies suggest 3 to 6 grams per day, taken 15 minutes before meals, are most effective.

Chitosan Ratings

Effectiveness: ★
Safety: ★★

If you would like more information on **chitosan** or to view our picks for the top commercially available products that contain chitosan, please follow this link: [Chitosan](#).

CARNITINE (L-carnitine) *non-stimulant

What is it?

Carnitine is classified as a nonessential amino acid because our bodies naturally make it. It is, however, required for our heart to function efficiently, especially during exercise. Carnitine's been touted as a "fat transporter," needed to transfer fatty acids across cell membranes into the mitochondria (the power factories of our cells) to be released and used as an energy source. Because the need for carnitine can exceed our bodies' production, carnitine is considered a "conditionally essential" nutrient.

How it works

At least theoretically, carnitine is responsible for transferring fatty acids across cell membranes to the mitochondria, which in turn uses the fat as a primary source of energy. For that reason, it's been concluded that supplementing with carnitine may help ensure the fatty acids are burned (oxidized) as fuel. However, some experts have suggested that carnitine does not increase the rate of weight loss but rather could increase the ratio of fat to muscle loss, thus preserving muscle mass while increasing the rate fat is burned. Again, this remains purely speculative at this time. But if carnitine levels are not optimal in our bodies, the level of fats in our bloodstream may be high, which may actually interfere with our ability to lose bodyfat.

What does the science say?

Despite the mounds of claims promoting its ability to burn fats for energy production, these bold claims have yet to be backed by conclusive research. However, research has shown that a carnitine deficiency may result in lower ATP (muscle energy) levels. Given that carnitine turnover is accelerated during exercise, shortages could limit the amount of energy available to muscles. The result is a rapid onset of fatigue and subsequent compromised recovery. As a result, recent research has revealed that individuals who supplement with carnitine while engaging in intense exercise programs are less likely to experience muscle soreness and fatigue than those who do not.

How to take it

For fat loss and increased energy during exercise, positive results have been reported with use of 2,000 to 4,000 mg, usually divided in two dosages throughout the day.

Important Tip: Carnitine should be supplemented about 30 minutes to one hour before exercise. Because other amino acids contained in proteins may hinder or compete for absorption, carnitine shouldn't be used with protein foods or supplements.

Carnitine Ratings

Effectiveness: ★
Safety: ★★★★★

If you would like more information on **carnitine** or to view our picks for the top commercially available products that contain carnitine, please follow this link: [Carnitine](#).

PYRUVATE (calcium pyruvate) *non-stimulant

What is it?

Although pyruvate's "15 minutes of fame" seems to have passed, based on new research, it may resurface again as a promising weight-loss aid. Pyruvate is the "end" product when carbohydrates and proteins are metabolized in the body. Even though we do ingest small amounts of pyruvate from food, research is suggesting that supplementation may be beneficial for individuals wishing to lose weight. A number of active people are interested in pyruvate for its potential to help boost both resting metabolic rate and improve our bodies' use of fuel—both ATP and blood sugar. But the research continues regarding how much is enough for those beneficial effects—ranging from as little as six grams a day to an unrealistic 30 grams a day.

How it works

Pyruvate's benefits appear to be the result of its potential to increase resting metabolic rate. More loosely stated, there is an increase in the use of fat as an energy source, thus raising our metabolic rate, and the higher our resting metabolism, the more calories we burn throughout the day—even when we're lying on the couch or sitting at the computer (as in now). The subject of much controversy—research suggests that while pyruvate may be effective for weight loss, the amount required is too high to be safe for daily consumption. That is until a recent study concluded its effectiveness at much lower amounts. This is simply a case "where the experts can't agree."

What does the science say?

In a recent double-blind, placebo-controlled study, over the course of a six-week trial, pyruvate significantly decreased not only bodyweight but bodyfat as well. Results were significant compared to the control and placebo groups, as the pyruvate group lost an average of 12% bodyfat (4.8 lbs of fat), while gaining 3.4 lbs of lean mass. This study also indicated resting metabolic rate increased by an average of 2.2% in the pyruvate group.

The reason for this significance is that past studies using pyruvate for weight loss used amounts upwards of 30 grams a day, which normally caused gastrointestinal issues (e.g., upset stomach). Now, in this recent study, the subjects who lost bodyfat used only six grams of pyruvate a day. This is good news for those wishing to use pyruvate for fat loss—and not wishing for stomach discomfort nor wanting to spend a load of money to achieve the desired effects.

How to take it

There are still many questions regarding "optimal" amounts of pyruvate to achieve desired effects, but much of the research for weight loss initially used 30 grams daily. However, recent research suggests as little as six grams per day taken before meals may be beneficial for fat loss. The most effective form is calcium pyruvate.

Pyruvate Ratings

Effectiveness: ★★
Safety: ★★

If you would like more information on **pyruvate** or to view our picks for the top commercially available products that contain pyruvate, please follow this link: [Pyruvate](#).

5-HTP (5-hydroxy tryptophan) *non-stimulant

What is it?

Not typically thought of as a fat-loss supplement per se, 5-HTP is naturally derived from the seed pods of a West African plant known as *Griffonia simplicifolia*. In the body, the amino acid tryptophan is converted to 5-HTP, which is converted to serotonin. 5-HTP is a precursor to serotonin, the neurotransmitter that signals our brains to feel happy and content. 5-HTP is normally used then to induce quality sleep and fight depression. But more recently, it's been marketed to help curb cravings for sweets and other carbohydrates, which is why it's quickly showing up on the labels of a number of fat-loss formulas and could be very helpful for those trying to lose weight.

How it works

It is theorized that many people are overweight because their bodies have a decreased conversion of the essential amino acid tryptophan to 5-HTP and, as a result, have lower levels of serotonin. By providing 5-HTP, this chemical reaction may be bypassed, so more serotonin is manufactured to help "turn off" feelings of hunger.

5-HTP is also believed to cause a feeling of early satiation. In other words, you may get full faster, causing you to eat less. Thus, 5-HTP is believed to be especially helpful for people who have a difficult time controlling how much they eat, specifically high-sugar and/or carbohydrate foods.

What does the science say?

There is no question that low serotonin levels can illicit cravings for high-sugar foods, but whether 5-HTP can or should be considered as a key part of a weight-loss strategy is still up for debate. One study demonstrated that 5-HTP was able to lower calorie intake and encourage weight loss, even in women who made no conscious effort to lose weight. The average amount of weight lost during this five-week study was over three pounds. Another notable study showed that 5-HTP helped people stick with their nutrition plans over a 12-week period. Those on the placebo lost only 2.28 lbs, while those supplementing with 5-HTP lost 10.34 lbs.

One caveat, though, scientists have found traces of the chemical Peak X—a compound similar to that found in the tryptophan contaminated in 1989 (that was linked to 38 deaths)—in some batches of 5-HTP. Supplement makers have since taken precautions to ensure their 5-HTP doesn't contain Peak X, and the FDA has confirmed that no other cases have been reported. Still, while 5-HTP's been cleared of any wrongdoings for quite some time, many past and potential users remain a bit skeptical about using it because of these unfortunate events.

How to take it

Reported beneficial dosages range from 50 to 300 mg per day, one to three times daily before meals. Fifty milligrams three times a day is the common dosage and the recommended place to start. After 2 weeks, increase the dose to 100 mg 3 times per day. Daily ranges used in weight-loss studies were as much as 700 to 900 mg.

5-HTP Ratings

Effectiveness: ★★
Safety: ★★

If you would like more information on **5-HTP** or to view our picks for the top commercially available products that contain 5-HTP, please follow this link: [5-HTP](#).

GUGGUL LIPID (guggalsterone) *non-stimulant

What is it?

Guggul lipid comes from the yellowish sap gathered from the bark of the small *Commiphora mukul* tree, which is a relative of myrrh. Gugguls are currently being marketed as the next fat-loss miracle, and while we've kept a close eye on it to see if it does ever match up to the hype, there hasn't been much evidence so far... at least in the way of *human* research. Until there are good, quality human studies, we're leaving this one on the shelf. That doesn't mean it should be completely forgotten, however. If heart health concerns you, this one may be worth checking out, as it's been shown to reduce "bad" (LDL) cholesterol.

How it works

Research with laboratory animals suggests guggul may work by helping enhance thyroid functioning. This is significant because the thyroid gland produces hormones that are needed to regulate metabolism. Studies show guggul may change thyroid hormone metabolism, increasing levels of circulating T3, or triiodothyroxine, a thyroxine metabolite known to raise overall metabolism. Theoretically at least, this should help the body burn significantly more fat. If this benefit is shown in humans as well, guggul will likely gain popularity for helping fight the accumulation of fat. But for now, it's only been shown to be true in little furry creatures.

What does the science say?

While there is some evidence to suggest guggul may help lower bodyfat accumulation, unfortunately, the data simply just isn't all in. However, other studies have confirmed the benefits of guggul on the cardiovascular system. In one 16-week study, 40 patients with heart disease were given twice daily divided doses of 4.5 grams of guggul lipid. The results were a 21.75% decrease in blood fats, including LDL, VLDL, and triglycerides, and a 35% increase in HDL. In this study, guggul lipid also reduced platelet stickiness, a factor in blood clotting, poor circulation, and stroke risk.

How to take it

Doses vary depending on the desired benefit: for weight loss—30 to 60 mg three times per day with meals; to lower high cholesterol—25 mg three times daily of guggul lipid.

Important Tip: Look for products that have been standardized to 25 mg guggulsterones (also spelled gugulsterones and guggalsterones) per dose. Avoid the crude gum—it's not well tolerated by the human body and can cause gastrointestinal distress.

Guggul Lipid Ratings

Effectiveness: ★★
Safety: ★★★★★

If you would like more information on **guggul lipid** or to view our picks for the top commercially available products that contain guggul lipid, please follow this link: [Guggul Lipid](#).

What is it?

HCA is found throughout Southeast Asia in a fruit called *Garcinia cambogia*, which has been used for centuries by Ayurvedic healers as a natural appetite suppressant and digestive aid. Later, it was used as a food preservative and flavoring agent in India. But, it's only recently become known for its potential ability to slow fat storage in the human body. For that reason, it's widely become available in most of today's leading fat-loss formulas. But that doesn't mean it's a miracle worker. In fact, claims for how (and even if) it works are still hotly debated.

How it works

The proposed benefits of HCA are based on its action as an inhibitor or blocker of the enzyme ATP citrate lyase, which is required for the synthesis of fatty acids. Simply put, it's supposed to "block fat storage." Theoretically, it does this by suppressing fatty acid mobilization and blocking the conversion of carbohydrates to fat, resulting in less fat storage. What's interesting is that it's only really active when carbohydrates are over-consumed. In other words, it supposedly only "kicks in" if you are partial to large plates of pasta or potatoes.

What does the science say?

Claims for how (and even if) it works are still hotly debated. Critics profess that further studies need to be conducted on humans, while proponents of this "fat-loss" aid stand by their animal research. Recently, two studies have indicated that HCA may not be as effective as claimed. A study by Mattes and Bormann from Purdue University took 89 mildly overweight females and prescribed 5,020-kilojoule (approximately 1,200-calorie) diets for 12 weeks. Forty-two of them took up to 2.4 grams of *Garcinia cambogia* (equivalent to 1.2 grams of HCA) spread evenly over the day prior to meals, while 47 of them ingested placebos. While both groups lost bodyweight, with the HCA group losing slightly more, there was no indication that HCA had any effects on helping the subjects stick to their diets or reduce their appetites. The overall result was that this study did not support the appetite-reducing claims of HCA.

How to take it

Suggested amounts range from 1,500 to 3,000 mg per day, divided in three doses. Studies typically use 1,500 mg (as hydroxycitric acid or HCA), divided in three doses throughout the day. However, the most recent study which showed HCA was effective used 8.4 grams of HCA, which is significantly more than most manufacturers are willing to recommend.

Important Tip: To check the actual milligrams of hydroxycitric acid (HCA) on the label if you're using a standardized extract form of *Garcinia cambogia*, it should contain at least 50% extract (i.e., a 50% extract of 500 mg *Garcinia cambogia* would yield approximately 250 mg of HCA).

HCA Ratings

Effectiveness: ★★
Safety: ★★★★★

If you would like more information on **HCA** or to view our picks for the top commercially available products that contain HCA, please follow this link: [HCA](#).

COLEUS FORSKOHLII (coleus)

What is it?

Coleus forskohlii is an ancient Ayurvedic plant and member of the mint and lavender family, which grows in the mountains of Asia. Recent research has shown that the active ingredient in coleus is forskolin, which plays a major role in a variety of important cellular functions, including inhibiting histamine release, relaxing muscles, increasing thyroid function, and increasing fat-burning activity. Though scientists are only just confirming the many benefits of coleus, there's a definite "buzz" circulating about its potential for aiding in fat loss.

How it works

The main argument for using it to drop fat is that the active chemical forskolin initiates a cascade of chemical reactions that cause fat cells to basically release their energy and melt away. In more technical terms, what happens is forskolin increases an enzyme called adenylate cyclase, which increases levels of another enzyme called cAMP (cyclic AMP), which is found in fat. cAMP then stimulates another enzyme, hormone sensitive lipase, to burn fat. Additionally, by a similar mechanism using cAMP, coleus increases thyroid hormone production and release, thereby increasing the body's metabolism, to burn *more* calories.

Basically, forskolin initiates a similar cascade of chemical reactions as ephedrine. Where coleus differs from ephedrine is ephedrine stimulates adrenergic receptors (which is the primary mechanism for ephedrine, even though this process is not totally accountable for its fat-burning effects) before it reaches cAMP. Unfortunately, many negative side effects can be experienced when some of these adrenergic receptors are stimulated, such as increased blood pressure, anxiety, etc. (This is basically why users of ephedrine-based supplements oftentimes experience unwanted and sometimes dangerous side effects.)

To the coleus user's advantage, however, coleus bypasses the adrenergic receptors and goes straight into the cAMP cycle, which is the next step in the ephedrine fat-burning process and subsequently also bypasses all of the potential unwanted, adverse effects associated with ephedrine. Simply stated, this is like having the option of two journeys driving to work: both will get you to the identical spot, and both will take the same amount of time, but one route (coleus) is a calm country drive with no traffic, whereas the other route (ephedrine) is a busy high-speed motorway with perils and hazards with every lane change... we know which route we prefer!

What does the science say?

Scientists have, in fact, studied the effects of coleus for over 15 years and have found an abundance of benefits, including bodyfat reduction and lean body mass enhancement. However, scientists are only now beginning to show *how* these effects occur in the real world. While more research is indeed needed (as is the case for many supplements), these theories and initial clinical studies adequately support its claimed benefits. Still, there is apparently some even more exciting research on the horizon.

Speaking of exciting research...

One of the most respected individuals in the field of sports nutrition research, Dr. Richard Kreider, gave an interesting presentation called "Ephedra Alternatives" at Nutracon, held in March 2002 in Anaheim. Here he touched on a range of speculative but promising nutrients, one of them being coleus. Dr. Kreider stated that initial pilot studies suggest *Coleus forskohlii* may promote weight and fat loss and/or mitigate (or moderate) weight gain in overweight subjects.

He also recently presented data at the 2002 Experimental Biology meeting of his own recently conducted study on coleus. In a double-blind, randomized study, 23 overweight females supplemented their diets with ForsLean (a patented form of coleus) extracted for 25 mg of forskolin two times per day for 12 weeks. The participants' body composition and bodyweight were examined every four weeks for the 12-week study period, and any side effects were recorded on a weekly basis. The study results found that although no significant differences were observed in caloric or macronutrient intake, ForsLean helped mitigate gains in body mass—that is, subjects taking ForsLean observed a slight decrease in bodyweight while subjects taking the placebo continued to gain weight. Additionally, the study showed users felt less fatigue, so they had more energy. And their appetites were reduced, so they felt fuller for longer. Also on the upside, there were no reported negative side effects.

How to take it

A common dosage range is 50 to 100 mg, two or three times a day.

Fluid extracts of two to four milliliters taken three times per day are used as well.

Important Tip: An extract standardized to at least 10% to 20% forskolin is preferred.

Coleus Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **coleus** or to view our picks for the top commercially available products that contain coleus, please follow this link: [Coleus](#).

GREEN TEA (Camellia sinensis)

What is it?

Green, black, and oolong teas are all derived from the same plant—*amellia sinensis*. This powerful tea was originally discovered by an emperor some 4,000 years ago. Since that time, green tea has notably become the "supplement of choice" for many seeking greater health and control over their weight. For good reason: not only does it have an interesting, appealing flavor when prepared as tea, science defends some astounding benefits when it's used as a supplement for immune enhancement and fat mobilization. New research has shown green tea may help our bodies burn more calories, faster, which is why it's showing up in more and more fat-loss formulas.

How it works

Green tea or, more accurately, the polyphenols in green tea, appear to activate our bodies' "thermogenic activity," promoting the use of calories as energy and thus may assist our "fat-fighting" efforts. These all-important polyphenols in green tea also appear to help produce "natural viral killer" immune cells, which scavenge and fight off bacteria and flush out toxins, which basically means it may protect our bodies from the free radicals that damage cells and weaken our immune systems. Of course, this is important for active people as well because intense exercise has actually been shown to increase free radicals in our bodies, and if free radicals are running amuck, it's more difficult to recover.

What does the science say?

A recent study in Geneva showed that green tea is naturally packed with caffeine and compounds called "catechin polyphenols." This is of significant interest to those of us trying to reduce our weight because both of these substances have been documented to increase resting metabolic rate—or more simply stated, rev up our bodies' calorie-burning potential. You see, the caffeine found in green tea allows our bodies to use bodyfat for energy (that is, it's "lipolytic"). When stored calories are used for short-term energy, our bodies burn more fat. In fact, this study, performed on healthy men, showed green tea alone produced a four percent increase in energy burned over a placebo. The researchers concluded that green tea may be useful for speeding up fat burning and promoting our bodies' ability to burn more calories over an extended time.

How to take it

Most research suggests taking 300 to 600 mg per day of green tea with meals, which should contain up to 97% polyphenol concentrate. (This would be equal to drinking four cups of tea per day.)

Important Tip: When choosing a green tea, it is best to look for the measurement of polyphenols, which are believed to be responsible for green tea's benefits. Three cups of tea per day should provide around 240 to 300 mg of the polyphenols.

Green Tea Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **green tea** or to view our picks for the top commercially available products that contain green tea, please follow this link: [Green Tea](#).

CHROMIUM *non-stimulant

What is it?

Chromium is an essential trace mineral that plays an important role in our bodies' normal carbohydrate metabolism—a process of converting the foods we eat into sugars. Chromium aids insulin, a natural hormone that's released in response to eating carbohydrates, in properly "shuttling" these sugars into cells to be stored as energy. In the past year, it's been noted that nearly 25 million Americans may be marginally deficient in chromium, which could be a leading contributor to the recent development of the insulin-resistance (diabetes), obesity, and hypoglycemia (low blood sugar) epidemic that's plaguing the U.S. It's for these reasons, chromium has become a popular supplemental aid in helping to maintain and/or improve bodyweight.

How it works

Although it's not clear exactly "how" chromium helps regulate blood sugar, a few theories are worth exploring. One suggests chromium binds both to insulin and the cell to use or attract blood sugar more efficiently. In other words, chromium possibly helps insulin "do its job," sort of as an insulin-potentiator, and helps it properly store these sugars as "reserved energy." Another theory suggests chromium may decrease the rate of extraction of insulin and improve glucose tolerance. Which means it helps allow insulin and glucose to work together more efficiently. It was found in studies that glucose tolerance could be restored in chromium-deficient patients once they were given a diet rich in chromium.

What does the science say?

Chromium (usually found in the form of chromium picolinate) has earned somewhat of an anecdotal reputation to help alter bodyfat, which has left many skeptics *and* aroused some controversy. Yet, two original studies have in fact confirmed chromium's potential to have significant effects on body composition. Using a newly patented form of niacin-bound chromium, called ChromeMate®, it was found to increase fat loss, reduce weight, and spare lean body mass in obese women.

In one placebo-controlled study, researchers at Georgetown University Medical Center showed that overweight women consuming 600 mcg of chromium (ChromeMate) for eight weeks experienced a significant loss of bodyfat while sparing muscle (lean body mass) compared with a prior placebo period of the same duration. In another study, researchers found that young obese women consuming 400 mcg of chromium as chromium nicotinate (ChromeMate) per day *in combination with exercise* experienced significant weight loss over an eight-week study period. In contrast, subjects who consumed chromium picolinate and did not exercise experienced significant weight gain during the study period.

How to take it

Most research suggests daily amounts of chromium range between 400 and 600 mcg, depending on the needs of the user. To obtain the full benefits, chromium should be taken with meals (such as at breakfast and/or dinner), especially with carbohydrate-containing foods.

Important Tip: Look for chromium in the form of ChromeMate® (a patented, niacin-bound chromium), the only form proven to effectively promote fat loss.

Chromium Ratings

Effectiveness: ★★

Safety: ★★★★★

If you would like more information on **chromium** or to view our picks for the top commercially available products that contain chromium, please follow this link: [Chromium](#).

What is it?

Often overlooked as a fat-loss supplement, it's only recently begun to be touted as one of the most underrated supplements on the market. For that reason, CLA might be worth taking a second look at. Over two decades of research have shown CLA may significantly help reduce bodyfat, and there's even recent evidence to support that it increases muscle tissue. Primarily, though, athletes and people who are weight conscious have begun supplementing with CLA because it's been shown in research to significantly shift body composition in favor of fat loss and muscle gain.

How it works

When leading CLA researcher Michael W. Pariza from the University of Wisconsin-Madison was asked, "How does CLA work?" he replied, "In a general sense, what it's doing is keeping little fat cells from getting big... perhaps by blocking certain enzymes that let fat cells swell."

Leading researchers have suggested that CLA's body-composition-altering effects are likely due to its ability to regulate the metabolism of fat through a fairly complex process having to do with our bodies' enzymes (namely, lipoprotein lipase and hormone-sensitive lipase). The long and short of it is that CLA appears to block fat uptake and then increase the speed of fat burning.

What does the science say?

Recently, Ola Gudmundsen of Scandinavian Clinical Research presented a study that suggests CLA could help people lose weight, primarily by reducing overall fat mass. In this groundbreaking study, 60 overweight people who were not allowed to diet were randomly assigned to take either a 9-gram placebo of olive oil or 1.7 grams, 3.4 grams, 5.1 grams, or 6.8 grams of CLA daily for 12 weeks. Their body composition was measured at the start, middle, and end of the study. "We saw that they had a significant reduction in weight in the CLA group," says Gudmundsen, "...about 2.2 lbs in 12 weeks." Even more promising, the researchers found that this loss was overwhelmingly from bodyfat and didn't affect overall weight or body mass index.

Another supportive study, conducted by Thom Erling, Ph.D., measured subjects' bodyfat and bodyweight over a three-month period. In this double-blind, placebo-controlled study, the first group took CLA at breakfast, lunch, and dinner. The second group took a placebo. At the end of three months, the CLA group lost an average of five pounds, which was not considered statistically significant. But, their bodyfat dropped by an impressive 15% to 20% compared to the placebo group who experienced little change.

In a brand new study presented at the Experimental Biology meetings this year, scientists gave mice either CLA or CLA plus the herbal stimulant guarana (which contains caffeine). What was interesting is that although the CLA group dramatically reduced the adipocyte (fat cell) size, the CLA plus the addition of guarana reduced the fat cells by an incredible 50%—**in just 6 weeks**. Can you use just a plain old cup of coffee and CLA for the same effect? The answer unfortunately is no. The caffeine in most drinks only gives a short-lived boost, while guarana gives an extended release, thus benefiting you for many hours.

How to take it

Most researchers agree 3,000 mg (three grams) divided into three dosages per day with meals is necessary for fat reduction. On the bonus side, 3,000 mg to 6,000 mg (three to six grams) divided into three dosages per day with meals has been shown in recent studies to help induce muscle-tissue growth.

CLA Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **CLA** or to view our picks for the top commercially available products that contain CLA, please follow this link: [CLA](#).

GUARANA (Paullinia cupana)

What is it?

Guarana is an herb that grows within the Brazilian Amazon rainforest. It contains significant amounts of guaranine (the active constituent that's virtually identical to caffeine) and has thus been used for centuries by indigenous tribes to help reduce hunger, relieve fatigue, and treat obesity. The surprising truth about guarana is that while it may be a valuable aid for temporarily increasing energy levels (which is usually needed before an intense workout or first thing in the morning as a "pick-me-up"), its ability to "free" fatty acids (i.e., fat cells) into the bloodstream and break down and mobilize these fat cells to use for energy makes it a "natural" choice for effective fat loss.

How it works

Like caffeine, guarana works by stimulating the adrenal glands to release the hormones epinephrine, norepinephrine (a.k.a. adrenaline), and dopamine, which in turn enhance thermogenesis—the body's ability to free fatty acids and use them for energy production (i.e., fat loss) as well as endurance and mental clarity. Contrary to popular (and limiting!) belief, these effects can be obtained seemingly without the often-proclaimed negative side effects. Nevertheless, guarana does have mild diuretic effects, so increasing water intake is very important with use of this herb.

What does the science say?

"Hot off the press": Dr. Torben Andersen undertook a study at Charlottenlund Medical Centre in Denmark with 44 healthy overweight patients using an herbal combination of guarana and another two herbs, yerba mate and Damiana. Dr. Andersen's results were quite positive: those taking the herbal combination for 45 days lost an average of 5 kg (or about 11 lbs). The difference was significant when compared to the placebo group, which lost only an average of 0.45 kg (or about one pound). Also noteworthy, the herbal combination delayed gastric emptying by 20 minutes, which means a longer feeling of fullness after eating a meal.

In a brand new study presented at the Experimental Biology meetings this year, scientists gave mice either CLA or CLA plus the herbal stimulant guarana (which contains caffeine). What was interesting is that although the CLA group dramatically reduced the adipocyte (fat cell) size, the CLA plus the addition of guarana reduced the fat cells by an incredible 50%—**in just 6 weeks**.

How to take it

Reports of use range anywhere from 500 to 1,000 mg, taken up to three times per day for increased thermogenic effects or instant energy.

Important Tip: Guarana should be standardized for a minimum of 15% caffeine—more simply put, to equal 100 mg of caffeine, about 450 mg of guarana would need to be consumed (equal to about a cup of coffee).

Guarana Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **guarana** or to view our picks for the top commercially available products that contain guarana, please follow this link: [Guarana](#).

EPHEDRINE (ephedra, ma huang)

What is it?

Ephedra, or ma huang (its interchangeable herbal names), is an ancient Chinese herbal form of the powerful stimulant ephedrine. Recently, it has grown in popularity—both good and bad—throughout the world, as a most revered weight-loss aid because it has been shown in numerous studies to temporarily suppress appetite, is a natural stimulant, and acts as a thermogenic—burning more calories, *faster*. Yet, because of the media's recent attention on its "higher than normal" rate of Adverse Event reports to the FDA, ephedrine may be best known for its potential negative side effects.

How it works

Imagine you're crossing the street and a speeding car almost hits you. Within seconds, you begin to sweat, your heart pounds, and you feel almost out of breath. This is known as the "fight-or-flight" response. Well, consuming ephedra (or ma huang) appears to produce a similar result—due to increased adrenaline and central nervous system stimulation of beta-1,2 receptors. In essence, it increases blood pressure and heart rate, makes you sweat, and increases blood flow to the heart, brain, and muscles. Only it may last quite a bit longer than your body's immediate response to avoiding a car—more like 20 to 30 minutes. This internal act, in turn, raises the body's core temperature—a process called thermogenesis—and helps break down (burn) fat cells.

What does the science say?

Ephedrine has been shown in numerous studies to be an effective weight-loss aid (as a thermogenic and appetite suppressant). Plus, research indicates it can temporarily enhance energy levels. Until recently, ephedrine was considered the most effective natural thermogenic on the market. However, you should know that since 1994, the FDA has received and investigated over 800 reports of Adverse Events (i.e., reactions) associated with products with ephedra (or ma huang). Reports that range from elevated blood pressure, muscle disturbances, insomnia, dry mouth, heart palpitations, nervousness, strokes, and even death.

Due to these reports, the FDA prompted a considerable study on ephedrine, entitled "Adverse Cardiovascular and Central Nervous System Events Associated with Dietary Supplements Containing Ephedra Alkaloids." The conclusion of the study, which was published in December of 2000, said "...the occurrence of events that caused permanent disability and death, we conclude that dietary supplements that contain ephedra alkaloids pose a serious health risk..." Then in December of 2003, the FDA banned ephedra from the market.

How to take it

For instant "energy" as a performance stimulant or to enhance the body's ability to burn fat, studies support taking from 12.5 to 25 mg of ephedrine two to three times daily. When using the herbal ma huang or ephedra extract (standardized for eight percent ephedrine alkaloids), 150 to 300 mg two to three times per day is reportedly effective.

Important Notice: If you do somehow find this supplement, read all warnings **before** supplementing with ephedrine. It's highly likely you'll find there are more possible (unwanted) side effects listed on the warning label than you bargained for—even more than many pharmaceutical prescription drugs.

Ephedrine Ratings

Effectiveness: ★★★★★

Safety: ★★

**Real SOLUTIONS does not support the sales of ephedrine-based products due to our concerns for consumer safety as well as the legalities of this product.*

CITRUS AURANTIUM (bitter orange, synephrine)

What is it?

Citrus aurantium, commonly referred to as bitter orange, has been used for thousands of years in Traditional Chinese Medicine to improve overall health. That is, until recently, when science discovered compounds (the most well-known being synephrine) from these little orange fruits demonstrated equally powerful thermogenic ("fat-burning") activity. In fact, synephrine has prominently become referred to as ephedra's "calmer chemical cousin" because it increases the body's metabolic rate or ability to burn calories, **without** producing negative side effects on the central nervous system and the cardiovascular system.

How it works

Citrus aurantium appears to work by way of its active compound called synephrine, which is a bit like ephedra (an amphetamine-like chemical found in a lot of weight-loss and performance products). Like ephedra, this chemical also appears to reduce appetite and boost metabolism—the rate our bodies burn calories—thus stimulating fat loss. Unlike ephedra, though, you're likely to experience very little, if any, side effects with *Citrus aurantium*. This is because *Citrus aurantium* contains chemicals called amines (tyramine and octopamine), which are not as lipophilic—meaning they do not cross the blood/brain barrier as easily as ephedra—which reduces central nervous stimulation and cardiovascular effects. In other words, this could mean no nervous energy (i.e., shakes or jitters), increased heart rate, or insomnia.

What does the science say?

According to recent research at McGill University, another reason *Citrus aurantium* gives you a smooth flow of energy without the jitters is because it stimulates certain receptors (called beta-3 adrenergic receptors) that help break down fat—known as lipolysis. Simultaneously, this stimulation causes an increase in the metabolic rate. Therefore, you burn fat without bothering other receptors (namely, beta-1, beta-2, or alpha-1) that over-stimulate your heart rate and blood pressure. In contrast, ephedra stimulates all alpha- and beta-adrenergic receptors, thus causing unwanted side effects. For this reason, synephrine is now being used as a replacement for central nervous stimulants like ephedra in many thermogenic formulas.

How to take it

Most leading research indicates that four to 20 mg of synephrine per day, which usually is provided by supplementing with 200 to 600 mg of a standardized *Citrus aurantium* extract (at three to six percent synephrine), may be most effective.

Citrus aurantium Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

If you would like more information on ***Citrus aurantium*** or to view our picks for the top commercially available products that contain *Citrus aurantium*, please follow this link: [Citrus aurantium](#).

YERBA MATE (maté, *Ilex paraguariensis*)

What is it?

Yerba mate is a member of the holly family, evident by its leathery leaves. It grows wild in the rainforests of Paraguay (where it is cultivated). Just about everyone has felt the jittery side effects of too much caffeine at one time or another. Yerba mate, in contrast, gives your brain a boost without making you nervous. Interestingly, it has been shown to improve mood and concentration, reduce anxiety, prevent mental fatigue, and prolong the effects of thermogenesis (i.e., fat burning)... along with a multitude of other compelling benefits.

How it works

There are 196 chemicals in yerba mate that become active in the body once consumed—including B vitamins; Vitamins A, C, and E; and the minerals calcium, magnesium, iron, potassium, and selenium. And maté has 11 polyphenols, which are powerful antioxidants. But the most important chemical in maté is "mateine." Mateine is a xanthine alkaloid. You might have heard of other xanthines, such as caffeine, theophylline, and theobromine. Strikingly, mateine appears to possess the best combination of xanthine properties. Like other xanthines, it mildly arouses the central nervous system, but unlike other stimulants, it **doesn't** appear to be addicting, nor does it produce unwanted side effects such as insomnia or nervousness. Interestingly, it actually works as a tonic for the central nervous system, calming the body and mind, leaving you feeling alert and sharp without any jitters.

The result of the chemical combination in maté is then responsible for its substantial increase in energy and fat burning. Maté appears to help support long-term energy by maintaining energy production with oxygen for longer periods of time, which burns more calories, improves heart efficiency, and delays buildup of endurance, robbing waste products, such as lactic acid that are created by anaerobic glycolysis (energy production without oxygen). One indicator that it is working to burn more fat is a drop in something called the respiratory quotient (RQ), which indicates a rise in the proportion of fat being oxidized or burned in the body.

What does the science say?

"Hot off the press": Dr. Torben Andersen undertook a study at Charlottenlund Medical Centre in Denmark with 44 healthy overweight patients using an herbal combination of guarana and another two herbs, yerba mate and Damiana. Dr. Andersen's results were quite positive: those taking the herbal combination for 45 days lost an average of 5 kg (or about 11 lbs). This was a significant difference compared to the placebo group, which lost only an average of 0.45 kg (or about one pound). Also noteworthy, the herbal combination delayed gastric emptying by 20 minutes, which means a longer feeling of fullness after eating a meal.

How to take it

Research indicates the intake of yerba mate to be most effective at 500 to 1,500 mg daily, two to three times evenly throughout the day, before meals and/or exercise. Recent theory: Maté may be most effective for promoting fat loss if one serving is taken upon rising, first thing in the morning, especially before cardiovascular exercise.

Yerba Mate Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **yerba mate** or to view our picks for the top commercially available products that contain yerba mate, please follow this link: [Yerba Mate](#).

What is it?

This powerful micronutrient is the product of years of intense research—7-Keto™ is a new breed of supplement—one engineered for specific results. Its ability to promote safe fat loss without the "buzz" of stimulants is a breakthrough in weight-loss supplements and is creating quite a stir in both the scientific arena and in the real world. Recently developed and awarded five patents, 7-Keto was discovered by Dr. Henry Lardy, who spent the last 10 years examining over 150 metabolites in hopes of finding a nutrient that would impart the positive benefits in promoting thermogenesis—increasing the body's metabolism (to burn more calories). What Dr. Lardy has discovered is suggested by many researchers to be the most potent thermogenic enhancer available in aiding safe, effective fat loss... and for good reason.

How it works

Search the shelves at your local health-food store, and you'll find them lined with today's more popular weight-loss products that claim to "boost" metabolic rate. However, look a little closer at the label, and you'll discover the substances contained in these formulas are nothing more than stimulant-based nutrients (i.e., caffeine, *Sida cordifolia*, etc.), which primarily works by suppressing the appetite and causes weight loss through limiting the urge to eat, with only a limited ability to increase the body's metabolic rate (its ability to burn calories).

7-Keto is quite different in its mechanism of action in the body. It works by helping increase the body's metabolic rate by way of the thyroid (T3) gland. A much safer approach to fat loss than stimulants. What most people don't realize is that after the age of about 25, our metabolisms (the rate our bodies burn calories) begin to slow, and often, no matter how hard we resist, our bodies insist on burning less and less calories. The inevitable response is to store the "unburned" calories as fat, and thus, we have a harder time keeping unwanted weight off. This is where 7-Keto can play a vital role in weight reduction and particularly in fat loss by "shifting" the metabolic rate, so the body is able to increase fat metabolism, even while resting.

What does the science say?

A new peer-reviewed clinical trial reveals a significant reduction in both bodyweight and bodyfat in overweight adults by positively impacting thyroid functioning: in a double-blind, placebo-controlled study, 100 mg of 7-Keto taken twice daily for eight weeks was shown to increase levels of the thyroid hormone T3 (or triiodothyronine) by an astounding, yet safe (within the normal range) 17.88%. The placebo group, by comparison, experienced an increase of only 2.75%. This is significant because T3 is not only the most active thyroid hormone but also has the greatest effect on metabolic rate.

These results for fat loss fared positively as well: over the eight weeks, the 7-Keto group lost a significant amount of bodyweight compared to the placebo group. In fact, the 7-Keto group lost three times more fat than the placebo

group (6.34 lbs vs. 2.13 lbs). Plus, bodyfat percentages decreased by 1.8% for the 7-Keto group, and the placebo group experienced only a .57% loss.

How to take it

Interestingly, because of the high cost to produce 7-Keto, most supplement companies suggest taking 25 to 50 mg per day. However, according to the most recent studies, 100 mg of 7-Keto taken twice daily (for 200 mg per day) was found to be most effective for weight loss. And evidence shows that taking from 100 to 200 mg per day can impart positive effects on fat loss.

Important Tip: 7-Keto is a patented supplement, so watch out ... if you come across a product that is supposed to have *real* 7-Keto in it, and it doesn't have the U.S. patent number 5,296,481 (for weight loss) on the label, don't buy it! It's a counterfeit.

7-Keto Ratings

Effectiveness: ★★★★★
Safety: ★★★★★

If you would like more information on **7-Keto** or to view our picks for the top commercially available products that contain 7-Keto, please follow this link: [7-Keto](#).

IN SUMMARY (our overall ratings):

Now you're armed with the detailed information you need to make informed, intelligent decisions on which fat-fighting aid is right for you. You know which are proven and can really make a difference, which remain speculative, which remain unproven, and equally important, which ones are safe and void of potential (harmful) side effects.

So whether you're trying to shed 30 lbs of fat, competing in a physique-transformation competition, striving to get ripped for your next vacation, or somewhere in between... you now have a clear-cut path because we've done the work for you and thoroughly reviewed and rated the top 15 "fat-fighting" supplements. *So you don't have to.*

Here's a quick review of the ratings of each supplement reviewed:

Using Our Rating Scale		
Effectiveness:	★	= literally worthless
	★★	= somewhat effective
	★★★	= proven effective
	★★★★	= extremely effective
Safety:	★	= not safe
	★★	= somewhat safe
	★★★	= concluded safe
	★★★★	= proven very safe

Chitosan Ratings

Effectiveness: ★

Safety: ★★

Carnitine Ratings

Effectiveness: ★

Safety: ★★★★★

Pyruvate Ratings

Effectiveness: ★★

Safety: ★★

5-HTP Ratings

Effectiveness: ★★

Safety: ★★

Guggul Lipid Ratings

Effectiveness: ★★

Safety: ★★★★★

HCA Ratings

Effectiveness: ★★

Safety: ★★★★★

Coleus Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

Green Tea Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

Chromium Ratings

Effectiveness: ★★

Safety: ★★★★★

CLA Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

Guarana Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

Ephedrine Ratings

Effectiveness: ★★★★★

Safety: ★★

***Citrus aurantium* Ratings**

Effectiveness: ★★★★★

Safety: ★★★★★

Yerba Mate Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

7-Keto Ratings

Effectiveness: ★★★★★

Safety: ★★★★★

The way we look at it, if we saved you time from sorting through all the supplements out there, if we saved you from wasting money on supplements that just don't work, if we helped guide you to the "best" supplements that will help you reach your physique-development goals—well then, we've done our job.

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Meet the Authors/Experts from *Real SOLUTIONS*...

who authored *Fat-Loss Supplements Under the Microscope*

[Stephen Adele](#)

Stephen Adele has been helping individuals from all walks of life create measurable results in their physiques and performance over the last 10 years and is rapidly becoming a respected authority. He has published numerous articles for magazines around the world, been quoted in several trade publications, appeared on radio shows, conducted seminars around the globe, and is highly sought after by the most prestigious supplement companies as an industry consultant. Stephen now shares his insights, expertise, and inside connections in two of the fastest growing publications in the industry, *Real SOLUTIONS* email newsletter and *Real SOLUTIONS* magazine, and has recently co-authored the consumer's guide, *7 Never-Before-Told Secrets Everyone Should Know Before Buying Supplements*. Over the years, Stephen's philosophy has remained unchanged: *The greatest gift you can give yourself is the gift of a strong mind, which can yield extraordinary dividends in the form of a stronger, healthier, and more energetic body.*

[James O'Byrne](#)

One of the smartest supplement science experts around, **James O'Byrne** from the UK certainly knows his stuff. He's been around this industry for over 10 years and has worked for the biggest, most prestigious supplement companies in the world, helping develop the GNC (General Nutrition Centres) retail franchises in Europe. And for the last two years, he's assisted Royal Numico (parent company to MET-Rx, Worldwide, and Rexall) in product development in Europe before his departure to become a highly sought-after industry consultant. His ability to decipher and interpret the science behind the supplements is unmatched—helping consumers make sense of otherwise complicated information. His reporting has been published in a number of magazines throughout Europe and within a publication he founded, *Advantage* magazine, circulated in the UK market.

References (Scientific Studies):

Chitosan

Deuchi, K., et al., "Continuous and Massive Intake of Chitosan Affects Mineral and Fat-Soluble Vitamin Status in Rats Fed a High-Fat Diet," *Biosci Biotechnol Biochem* 59.7 (1995) : 1211-6.

Pittler, M.H., et al., "Randomized, Double-Blind Trial of Chitosan for Body Weight Reduction," *Eur J Clin Nutr* 53.5 (1999) : 379-81.

Carnitine

Dragan, I.G., et al., "Studies Concerning Chronic and Acute Effects of L-Carnitine in Elite Athletes," *Physiologie* 26.2 (1989) : 111-29.

Kuratsune, H., et al, "Acylcarnitine Deficiency in Chronic Fatigue Syndrome," *Clin Infect Dis* 18.S1 (1994) : S62-7.

Pyruvate

Kalman, D., et al., "The Effects of Pyruvate Supplementation on Body Composition in Overweight Individuals," *Nutrition* 15.5 (1999) : 337-40.

Stanko, R.T., et al., "Pyruvate Supplementation of a Low-Cholesterol, Low-Fat Diet: Effects on Plasma Lipid Concentrations and Body Composition in Hyperlipidemic Patients," *Am J Clin Nutr* 59.2 (1994) : 423-7.

Sukala, W.R., "Pyruvate: Beyond the Marketing Hype," *Int J Sport Nutr* 8.3 (1998) : 241-9.

5-HTP

Birdsall, T.C., "5-Hydroxytryptophan: A Clinically-Effective Serotonin Precursor," *Altern Med Rev* 3.4 (1998) : 271-80.

Ceci, F., et al., "The Effects of Oral 5-Hydroxytryptophan Administration on Feeding Behavior in Obese Adult Female Subjects," *J Neural Transm* 76.2 (1989) : 109-17.

Guggul lipid

Kuppurajan, K., et al., "Effect of Guggulu (*Commiphora mukul*—Engl.) on Serum Lipids in Obese, Hypercholesterolemic and Hyperlipemic Cases," *J Assoc Physicians India* 26.5 (1978) : 367-73.

Mester, L., et al., "Inhibition of Platelet Aggregation by "Guggulu" Steroids," *Planta Med* 37.4 (1979) : 367-9.

Panda, S., and Kar, A., "Gugulu (*Commiphora mukul*) Induces Triiodothyronine Production: Possible Involvement of Lipid Peroxidation," *Life Sci* 65.12 (1999) : PL137-41.

Tripathi, Y.B., et al., "Thyroid Stimulatory Action of (Z)-Guggulsterone: Mechanism of Action," *Planta Med* 54.4 (1988) : 271-7.

HCA

Conte, A.A., "The Effects of (-)-Hydroxycitrate and Chromium (GTF) on Obesity," *J Am Coll Nutr* 13 (1994) : 535.

Heymsfield, S.B., et al., "*Garcinia cambogia* (Hydroxycitric Acid) as a Potential Antiobesity Agent: A Randomized Controlled Trial," *JAMA* 280.18 (1998) :1596-600.

Mattes, R.D., and Bormann, L., "Effects of (-)-Hydroxycitric Acid on Appetitive Variables," *Physiol Behav* 71.1-2 (2000) : 87-94.

van Loon, L.J., et al., "Effects of Acute (-)-Hydroxycitrate Supplementation on Substrate Metabolism at Rest and During Exercise in Humans," *Am J Clin Nutr* 72.6 (2000) : 1445-50.

Wheeler, T.J., "Hydroxycitrate as a Weight Loss Ingredient," *Healthcare Reality Check*, July 1999 (Review).

Coleus forskohlii

Imbeault, P., et al., "Beta-Adrenoceptor-Stimulated Lipolysis of Subcutaneous Abdominal Adipocytes as a Determinant of Fat Oxidation in Obese Men," *Eur J Clin Invest* 30.4 (2000) : 290-6.

Kreider, R.B., et al., "Effects of *Coleus forskohlii* Supplementation on Body Composition and Markers of Health in Sedentary Overweight Females," *Experimental Biology 2002 Late Breaking Abstracts*. LB305: 2002. Presented April 24, 2002, New Orleans, LA.

Lindner, E., et al., "Positive Inotropic and Blood Pressure Lowering Activity of a Diterpene Derivative Isolated from *Coleus forskohlii*: Forskolin," *Arzneimittelforschung* 28.2 (1978) : 284-9.

De Souza, N.J., et al., "Forskolin: a Labdane Diterpenoid with Antihypertensive, Positive Inotropic, Platelet Aggregation Inhibitory, and Adenylate Cyclase Activating Properties," *Med Res Rev* 3.2 (1983) : 201-19.

Green Tea

Benzie, I.F., et al., "Consumption of Green Tea Causes Rapid Increase in Plasma Antioxidant Power in Humans," *Nutr Cancer* 34.1 (1999) : 83-7.

Dulloo, A.G., et al., "Efficacy of a Green Tea Extract Rich in Catechin Polyphenols and Caffeine in Increasing 24-h Energy Expenditure and Fat Oxidation in Humans," *Amer J Clin Nutr* 70.6 (1999) : 1040-5.

Dulloo, A.G., et al., "Green Tea and Thermogenesis: Interactions Between Catechin-Polyphenols, Caffeine and Sympathetic Activity," *Int J Obes Relat Metab Disord* 24.2 (2000) : 252-8.

Chromium

Hallmark, M.A., et al., "Effects of Chromium and Resistive Training on Muscle Strength and Body Composition," *Med Sci Sports Exerc* 28.1 (1996) : 139-44.

Kaats, G.R., et al., "Effects of Chromium Picolinate Supplementation on Body Composition: A Randomized, Double-Masked, Placebo-Controlled Study," *Curr Ther Res* 57 (1996) : 747-56.

Kaats, G.R., et al., "A Randomized, Double-Masked, Placebo-Controlled Study of the Effects of Chromium Picolinate Supplementation on Body Composition: A Replication and Extension of a Previous Study," *Curr Ther Res* 59 (1998) : 379-88.

Mertz, W., "Interaction of Chromium with Insulin: A Progress Report," *Nutr Rev* 56.6 (1998) : 174-7.

Chromium (ChromeMate®)

Crawford, V., et al., "Effects of Niacin-Bound Chromium Supplementation on Body Composition in Overweight African-American Women," *Diabetes, Obesity, and Metabolism* 1 (1999) : 331-7.

Grant, K.E., et al., "Chromium and Exercise Training: Effect on Obese Women," *Med Sci Sports Exerc* 29 (1997) : 992-8.

CLA

Blankson, H., et al., "Conjugated Linoleic Acid Reduces Body Fat Mass in Overweight and Obese Humans," *J Nutr* 130.12 (2000) : 2943-8.

Ferreira, M., Kreider, R., et al., "Effects of CLA Supplementation During Resistance Training on Body Composition and Strength," *J Strength Cond Res* 11.4 (1998) : 280.

Pariza, M.W., et al., "Mechanism of Body Fat Reduction by Conjugated Linoleic Acid," *FASEB J* 11 (1997) : A139.

West, D., "Reduced Body Fat with Conjugated Linoleic Acid Feeding in the Mouse," *FASEB J* 11 (1997) : A599.

Guarana

Andersen, T., and Fogh, J., "Weight Loss and Delayed Gastric Emptying Following a South American Herbal Preparation in Overweight Patients," *J Hum Nutr Diet* 14.3 (2001) : 243-50.

Bempong, D.K., and Houghton, P.J., "Dissolution and Absorption of Caffeine from Guarana," *J Pharm Pharmacol* 44.9 (1992) : 769-71.

Morton, J.F., "Widespread Tannin Intake Via Stimulants and Masticatories, Especially Guarana, Kola Nut, Betel Vine, and Accessories," *Basic Life Sci* 59 (1992) : 739-65.

Citrus aurantium

Candelore, M.R., et al., "Potent and Selective Human Beta(3)-Adrenergic Receptor Antagonists," *J Pharmacol Exp Ther* 290.2 (1999) : 649-55.

Chen, X., et al., "The Effects of *Citrus aurantium* and its Active Ingredient N-Methyltyramine on the Cardiovascular Receptors," *Yao Xue Xue Bao* 16.4 (1981) : 253-9.

Colker, CM., et al., "Effects of *Citrus aurantium* Extract, Caffeine, and St. John's Wort on Body Fat Loss, Lipid Levels, and Mood States in Overweight Healthy Adults," *Curr Ther Res* 60 (1999) : 145-53.

Fontana, E., et al., "Effects of Octopamine on Lipolysis, Glucose Transport and Amine Oxidation in Mammalian Fat Cells," *Comp Biochem Physiol C Pharmacol Toxicol Endocrinol* 125.1 (2000) : 33-44.

Galitzky, J., et al., "Specific Stimulation of Adipose Tissue Adrenergic Beta 3 Receptors by Octopamine," *C R Acad Sci III* 316.5 (1993) : 519-23.

Ephedrine

Gurley, B.J., et al., "Ephedrine Pharmacokinetics After the Ingestion of Nutritional Supplements Containing *Ephedra sinica* (ma huang)," *Ther Drug Monit* 20.4 (1998) : 439-45.

Haller, C.A., et al. "Adverse Cardiovascular and Central Nervous System Events Associated with Dietary Supplements Containing Ephedra Alkaloids," FDA docket no. 00N-1200. Rockville, Md.: Food and Drug Administration, 2000. (See www.accessdata.fda.gov/scripts/oc/ohrms/index.cfm.)

Robertson, D., "Effects of Caffeine on Plasma Renin Activity, Catecholamines and Blood Pressure," *N Engl J Med* 298 (1978) : 181-6.

Shannon, J.R., et al., "Acute Effect of Ephedrine on 24-h Energy Balance," *Clin Sci (Colch)* 96.5 (1999) : 483-91.

White, L.M., et al., "Pharmacokinetics and Cardiovascular Effects of Ma-Huang (*Ephedra sinica*) in Normotensive Adults," *J Clin Pharmacol* 37.2 (1997) : 116-22.

Yerba Mate

Andersen, T., and Fogh, J., "Weight Loss and Delayed Gastric Emptying Following a South American Herbal Preparation in Overweight Patients," *J Hum Nutr Diet* 14.3 (2001) : 243-50.

Martinet, A., et al., "Thermogenic Effects of Commercially Available Plant Preparations Aimed at Treating Human Obesity," *Phytomedicine* 6.4 (1999) : 231-8.

Pasquale, D., "A Controlled Double-Blind Clinical Trial of Mate for Subjects on a Low-Calorie Diet," *Clinica Dietologica* 18 (1991) : 27-38.

7-Keto™

Colker, C., et al., "Double-Blind, Placebo-Controlled, Randomized Clinical Trail Evaluating the Effects of Exercise Plus 3-Acetyl-7-oxo-dehydroepiandrosterone on Body Composition and the Endocrine System in Overweight Adults," *J Exer Physiol Online* 2.4 (1999).

Davidson, M.H., et al., *Clinical Safety and Endocrine Effects of 7-Keto™ DHEA* (presented at Experimental Biology '98, San Francisco, CA).

Kalman, D.S., et al., "A Randomized, Double-Blind, Placebo Controlled Study of 3-Acetyl-7-Oxo-Dehydroepiandrosterone in Healthy Overweight Adults," *Curr Ther Res* 61.7 (2000) : 435-42.

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