CAPSILEAN™

Fire up Fat Loss

Fat isn't just uncomfortable—it's unhealthy. With the growing obesity epidemic, weight loss is a major focal point in the health care industry. Estimated medical expenses this year alone are nearly $210 **billion** dollars.

Obesity is deadly.

Failing to lose weight can lead to more serious health issues-and while you're struggling with weight loss, being overweight can cause *low self-esteem*, *depression* and a **reduced quality of life**.

Because of that, many overweight people are ***desperate for a solution.*** When it comes to weight loss, the source of stubborn fat can be **more than one**. When diet and exercise aren't working, it's an indicator that other problems are to blame.

Organic deficiencies, hormones, aging and gut bacteria can all be part of the problem.

But most solutions out there only address one problem. Until now.

CAPSILEAN™: A Comprehensive Approach to Weight Loss

- Triggers thermogenesis to increase the number of calories you burn every day.
- Reduces carb absorption and blood glucose after eating.
- Increases carb and glucose metabolism to reduce the impact of carbs and sugar on body.
- Reduces fat accumulation and weight.
- Breaks down and burns fat.
- Decreases appetite.
- Improves cholesterol.
- Improves insulin sensitivity.
- Reduces waist hip ratio.
- Prevents muscle breakdown.

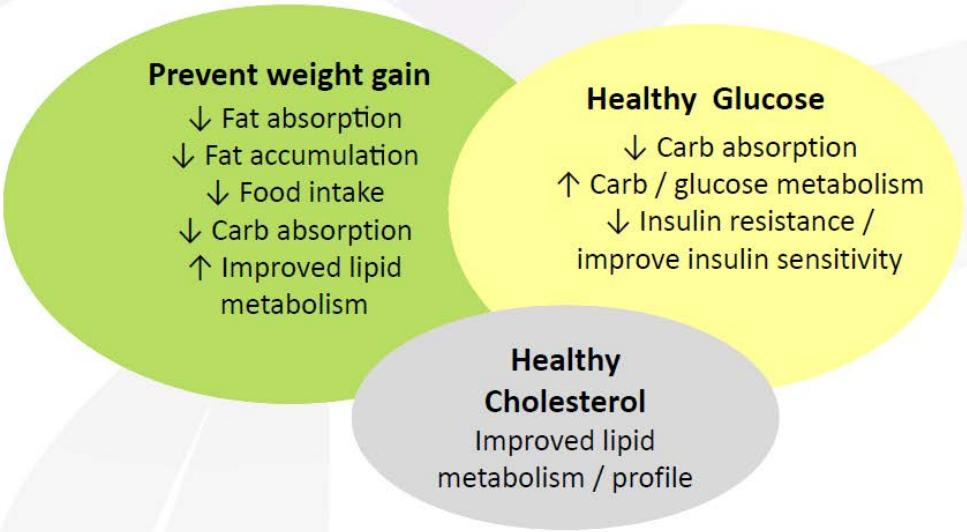
- Aids in digestion.
- Improves nutrient absorption.
- Improves overall body composition.

CAPSILEAN™ FORMULA

CAPSILEAN™ attacks weight loss from multiple angles with synergistically paired and scientifically supported ingredients.

OMNILEAN™ Reduces Carb and Fat Absorption

Weight gain starts with what you eat. The way your body absorbs carbohydrates and sugars can have a critical bearing on weight. Omnilean™ is Salacia Chinensis Extract from the root of a plant that is used in weight management and in the prevention of diabetes in ancient Indian medicine.



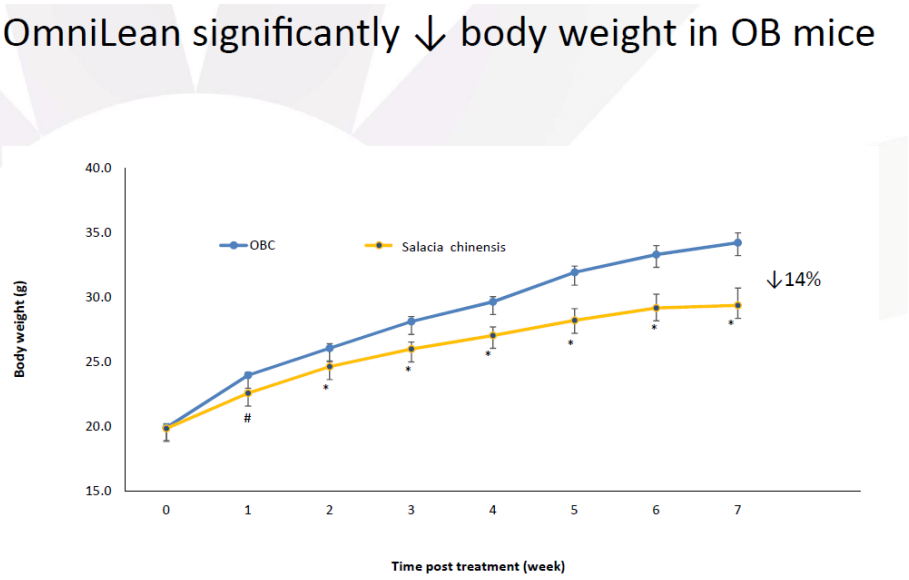
Omnilean™

- Inhibits Alpha glucosidase which slows down glucose absorption.
- Reduces the impact of carbs and blood sugar on the body.
- Reduces blood glucose levels after eating.
- Reduces carb absorption after eating.
- Increases carb metabolism.
- Increases glucose metabolism.
- Decreases insulin resistance.
- Improves uptake of glucose.
- Reduces fat accumulation.
- Reduces weight.

Omnilean™ acts as an alpha-glucosidase inhibitor. Alpha-glucose inhibition slows down glucose absorption which reduces the effect of carbohydrates on the body.

Sugar and simple carbs, like breads and sweets, are broken down very quickly by the body and converted into glucose. Glucose is released into the blood stream and what is not used for energy is stored as fat for future energy use. Slowing down the absorption of carbohydrates reduces glucose and fat storage. Additionally, Omnilean™ hydrolyzes, or breaks down fat so your body can't store it. So while it's reducing carb absorption, it also takes bad fats and breaks them down so the body doesn't store it on common places like your hips, thighs and gut.

In studies the test subject, obese mice, lost **14 percent of their body weight in seven weeks when taking SCE**.

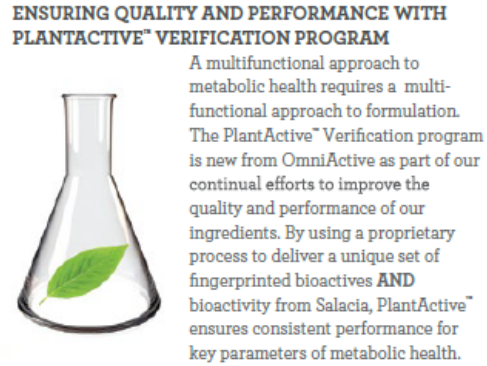


Studies showed Omnilean™ reduced fat absorption, glucose, insulin resistance and slowed carb absorption which resulted in weight loss.

Adiponectin	Insulin	Leptin
15.8	-21.0	-20.4
↓fat absorption **↓glucose** ↓ **↓ insulin resistance** **↓ body weight**	↑ carbohydrate ↓ ↓ glucose ↓ ↓ body weight	↓hunger ↓ ↓ energy intake ↓ ↓ body weight

Studies also show Omnilean™ reduced the urge to snack and increased feelings of being satisfied longer by suppressing hunger hormone activity.

What makes it different? OmniActive™ has an internal verification program called "PlantActive" to ensure that every batch of OmniLean ™ provides both beneficial levels of active compounds and biologic activity to support healthy carbohydrate and lipid metabolism for weight management.



The Science Behind Salacia Extract

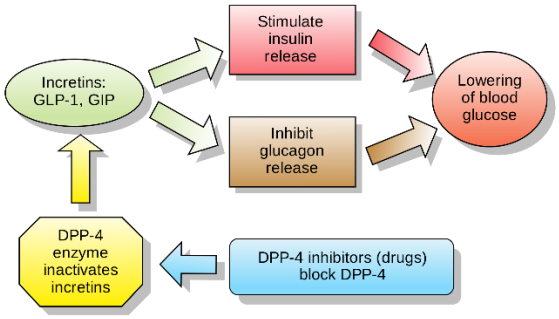
The various active principles of Salacia include:

- Diterpenes
- Friedelanes
- Mangiferin
- Megastigmane glycosides
- Oleananes,
- Polyols
- Quinonemethides
- Thiocyclitol
- Triterpenes

Salacia has been known to control weight and obesity issues. Its effect on obese patients has been extensively studied. In most pertinent part, its role as an alpha-glucosidase inhibitor.

Omnilean™ SCE stem and roots contain a-glucosidase inhibitors salacinol and kotalanol. Alpha-glucosidase is an intestinal enzyme. It breaks down sucrose into both glucose and fructose. Alpha-glucosidase inhibitors, also called starch blockers, slow or prevent the absorption of certain carbohydrates in the gastrointestinal tract.

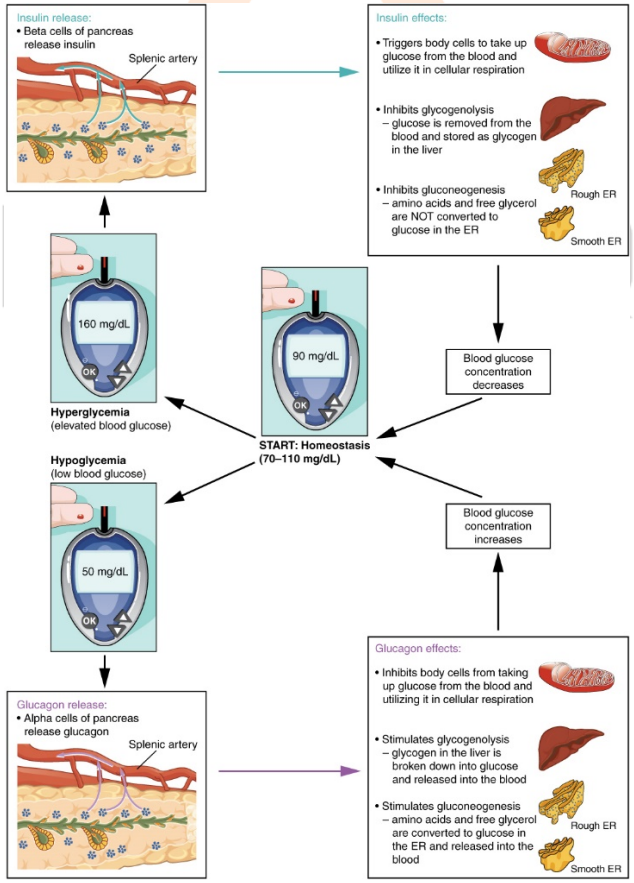
The result delays and reduces the amount of glucose available for absorption by interfering with the breakdown of the long-chain carbohydrates. This allows the pancreas more time to secrete insulin to properly utilize sugar.



Insulin is a hormone made by the pancreas that allows your body to use glucose from carbohydrates in the food that you eat for energy or to store glucose for future use. It regulates blood sugar level so it doesn't get too high or low.

After you eat food and your blood sugar level rises, beta cells in your pancreas release insulin into your blood. Insulin responds and triggers cells to absorb sugar from the blood. Insulin allows sugar to be used by cells for energy.

If you have a surplus of sugar, insulin pilots the storage of sugar in your liver and releases it when your blood sugar is low or increased energy usage demands it.



Insulin response. Public Domain.

In other words, Alpha-glucose inhibition slows down the absorption of glucose which reduces the effect of carbohydrates on the body. Because inhibition of alpha-glucosidase, less glucose is absorbed because the carbs are not broken down into glucose molecules.

Less glucose molecules means less glucose to store and convert into fat.

Because alpha-glucosidase inhibitors prevent the breakdown and digestion of carbohydrates into glucose, the carbs remain in the intestine. Bacteria then consumes and digests them causing some gastrointestinal side effects such as gas.

Studies:

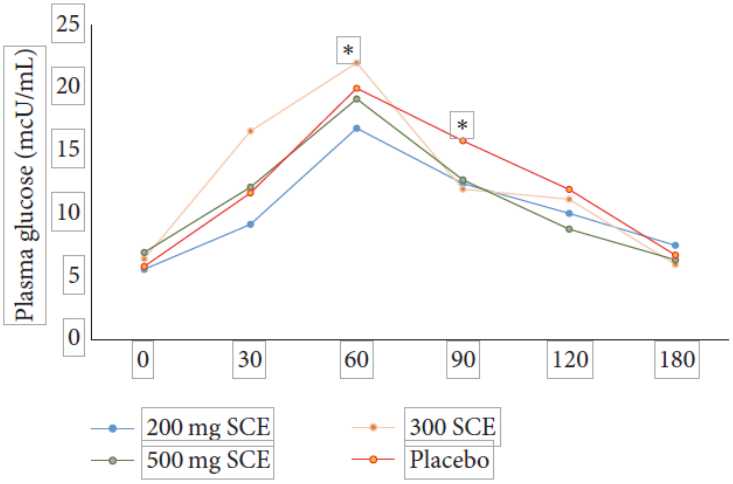
In Omnilean, the salacia composition includes at least 12% of polyphenols, 2% of Mangiferin, and 1% of 25, 26-oxidofriedelane-1,3-dione by weight of the composition in the form of extract.

Studies were conducted with sucrose loading, rather than starch, as recommended by FDA for alpha-glucosidase inhibitor products and sucrose is the most suitable carbohydrate load.

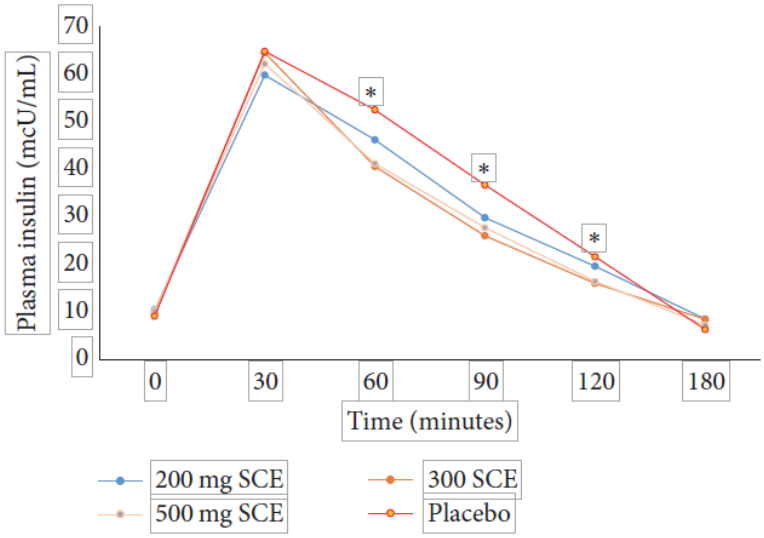
Sucrose loading in testing is more accurate than testing with a meal because it produces a reproducible change in blood glucose concentration. Additionally, as a dissacharide, it cannot be absorbed until it is broken down to glucose and fructose α-glucosidase.

Reduced Postprandial Blood Glucose

After a dose of SCE, the decrease in absorption of glucose produced from sucrose reflects the activity of α-glucosidase, successfully reflecting the efficacy of SCE. As such, sucrose loading provides a better baseline measure of α-glucosidase activity.



Sucrose loading increased blood glucose concentrations at 30 minutes after administration. Subjects treated with SCE have reduced blood glucose and insulin.



Elevation of insulin levels following sucrose loading was also significantly inhibited by SCE compared with placebo; the inhibition was significant at 30 and 60 minutes after administration of 300 and 500 mg SCE.

During a sucrose load, SCE reduced insulin in a dose-dependent fashion and glucose was also reduced. These results indicate that SCE reduces carbohydrate absorption.

Insulin levels were reduced not only via a decreased glycemic stimulus but also by interference with other insulin releasing mechanisms.

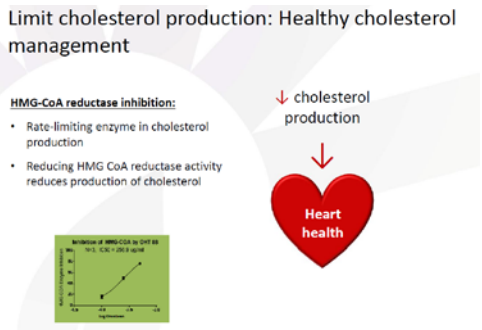
The results in summary: SCE does not directly decrease glucose in the blood stream but was shown to inhibit intestinal absorption.

Reduction in Body Composition, Weight, and Risk of Cardiovascular Events

In the Study to Prevent NIDDM trial, the group randomly assigned to acarbose, an alpha-glucosidase inhibitor, had a reduction in:

- Blood triacylglycerols
- BMI
- Body weight
- Systolic and diastolic blood pressure
- Two Hour postprandial glucose
- Waist and hip circumferences

During a three year following of subjects, they also experienced a significantly reduced incidence of cardiovascular events and hypertension.



Reduction in Myocardial Infarction

Seven long-term studies showed that α-glucosidase inhibitors significantly reduce the risk of myocardial infarction or any cardiovascular event

In a randomized double-blind, placebo controlled, crossover study, thirty healthy human participants were given a placebo or 1000 mg of an SCE. The extract decreased postprandial blood glucose levels after a carbohydrate-rich meal by about 13 percent at 90 min, while the plasma glucose area under the curve was decreased by about 34 percent.

SCE markedly decreased digestion and absorption of sucrose by its inhibitory action on sucrose. It reduced increases in blood glucose and insulin. Long-term studies showed significant reduction in risk for cardiovascular events including myocardial infarction.

The number of calories you burn in a day can impact weight gain. If you burn fewer calories than a slimmer person, you'll store more of what you eat as fat. Increasing the number of calories you burn can be achieved through exercise, but also through **thermogenesis.**

Capsaicin, which is responsible for the burn you feel from chili peppers, stimulates thermogenesis by increasing expended energy which burns more calories.

CAPSIMAX®

The compounds that give capsicum in red hot peppers its intense pungent heat are collectively called capsaicinoids which include the most common: capsaicin, dihydrocapsaicin and nordihydrocapsaicin.

Capsaicin alters the metabolism via activation of transient receptor potential vanilloid 1 (TRPV1.)

Capsaicinoids act a as agonists of TRPV1 and imitate the effects of acute cold exposure in the body which activates brown fat and decreases body fat as a result [27].

TRPV1 activation induces calcium inflow and in certain tissues increases expression of key proteins—and in this case, an uncoupling protein called thermogenin.

The calcium inflow produced by TRPV1 activation mimics stress which triggers the expression of endothelial nitric oxide synthase (eNOS) and other antioxidant enzymes. It also reduces pro-inflammatory proteins, exports cholesterol and increases vasodilation.

Capsaicin also stimulates TRPV1-expressing neurons in the GI tract activating sympathetically facilitated stimulation of brown fat which increases the metabolic rate.

Kinase-mediated phosphorylation of TRPV1 precedes increased sensitivity to both chemical and thermal stimuli. When consumed, capsaicinoids trigger the release of epinephrine and norepinephrine from the adrenal glands. This activates brown adipose tissue (brown fat) which results in thermogenesis.

Brown fat can be activated by acute cold exposure and promotes cold-induced increase in whole-body energy expenditure (shivering) which increases energy expenditure resulting in decreased body fat.

Over 90 studies support that capsaicin is extremely effective in weight management. Clinical studies show capsaicin:

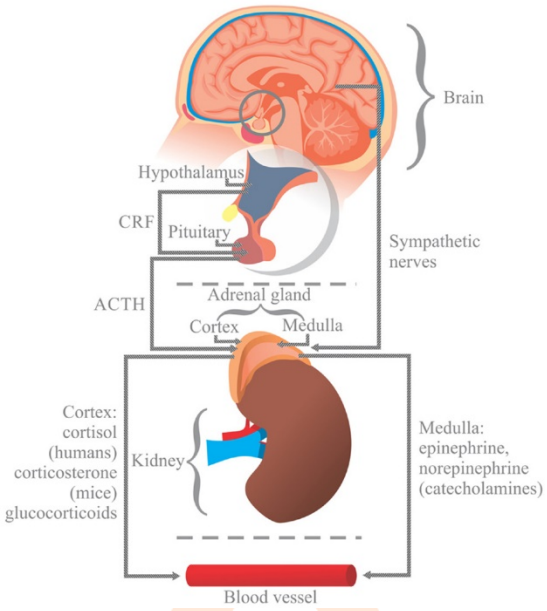
- Burns up to 135 calories more per day.
- Reduces caloric intake of up to 74 calories per meal.
- Reduces liver fat.
- Improves glucose tolerance.
- Decreases inflammation.
- Increases insulin sensitivity.
- Reduces visceral fat.
- Thermogenesis burns more calories daily.
- Breaks down fat.
- Increases metabolism.
- Decreases appetite.
- Increases satiety.

Capsaicinoids and Hormone Response

Approximately three milligrams of capsaicinoids are contained in one gram of dried red pepper.

When consumed, capsaicinoids initiate the sympathetic nervous system, triggering the release of epinephrine and norepinephrine from the adrenal glands.

This effect elicits responses from pathways that result in appetite control, lipolysis and thermogenesis.

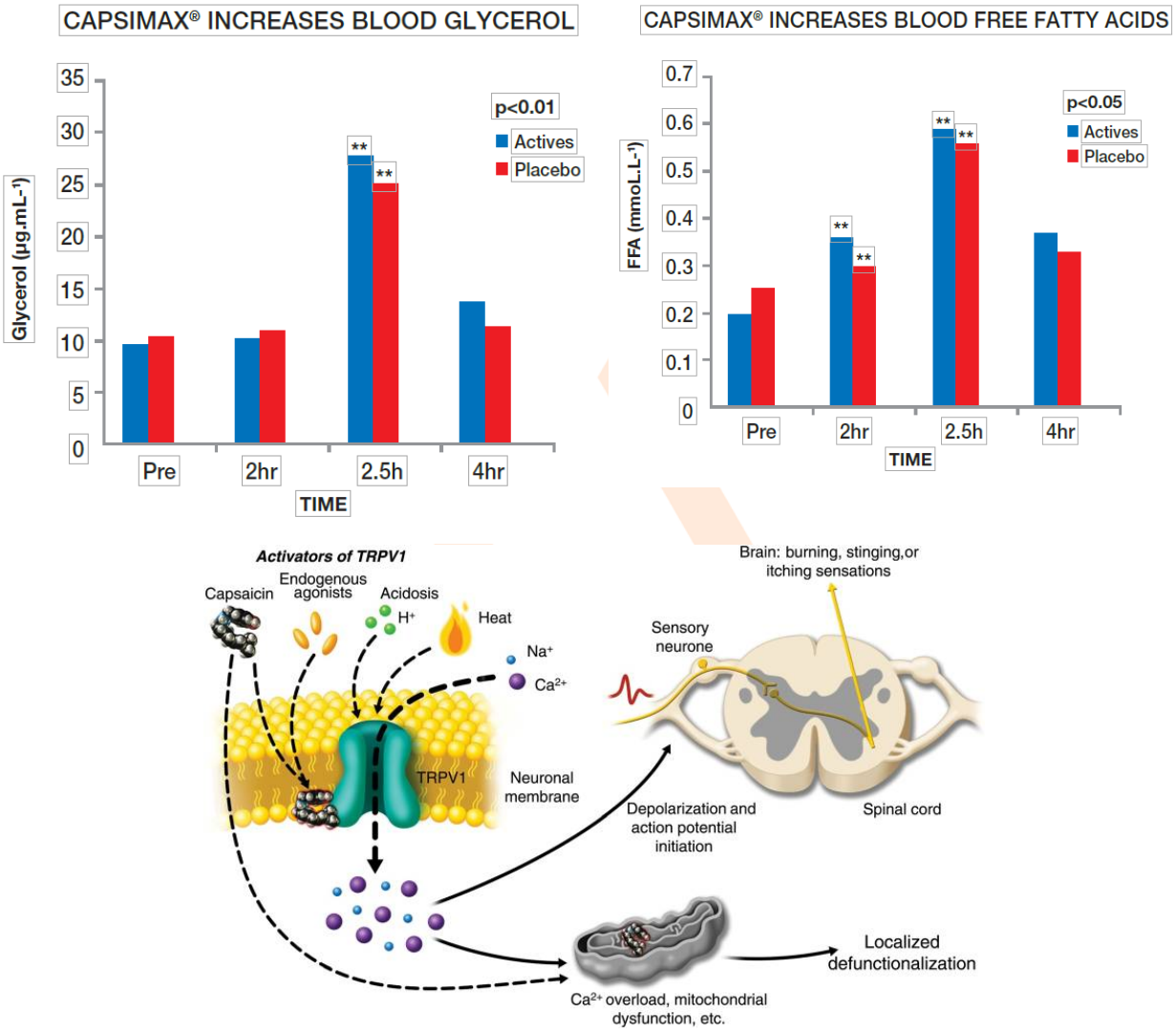


Capsaicinoids and Appetite

Appetite control is achieved by effecting the complex system comprised of hormones, the nervous system, fat tissue and digestive tract.

Capsaicinoids activate TRPV1 which increases satiety and suppresses hunger.

In one study when capsaicinoids were consumed prior to or with a meal, caloric intake was reduced by around 74 calories [59].



Capsaicin and Fat Breakdown

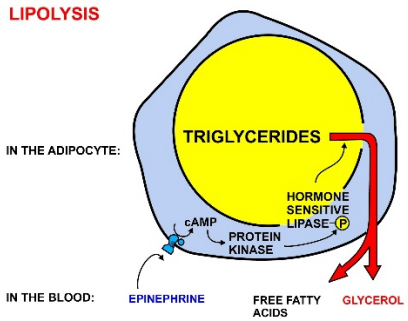
Lipolysis is a highly controlled biochemical pathway that powers the breakdown of stored lipids. Epinephrine and norepinephrine act on lipase, perilipin and adipose triglyceride lipase all which all play a role in activating fat and breaking down triglycerides into free fatty acids and glycerol.

Fat oxidation increases due to the epinephrine and norepinephrine response that supports fat oxidation and increases in energy expenditure. Both of which have been observed between capsaicinoid treatment, illustrating a shift towards fat utilization at rest.

Studies also showed significant increase in plasma free fatty acids and glycerol compared to placebo following a low dose administration of Capsimax® in conjunction with exercise.[11]

Many studies have confirmed an increase in lipolysis following capsaicinoid intake, including a superior decrease in abdominal adiposity with capsaicinoid intake (6mg per day) compared to placebo when subjects were randomly assigned to either for a period of 12 weeks.

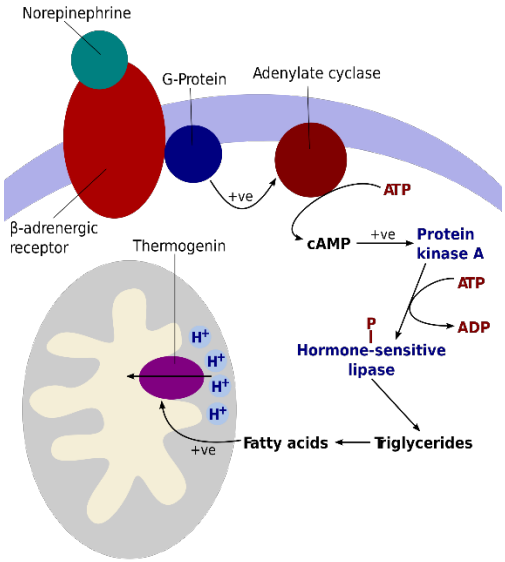
The quantification of lipolysis in human subjects includes a measure of the respiratory exchange ratio (VCO2/VO2) and/or measurement of blood free fatty acids and glycerol concentrations. Taking in the latter may provide additional confirmation and substantiation for fat mobilization post-capsaicinoid consumption.



Capsimax® promotes lipolysis and sustains the mobilization of fats for energy production[2].

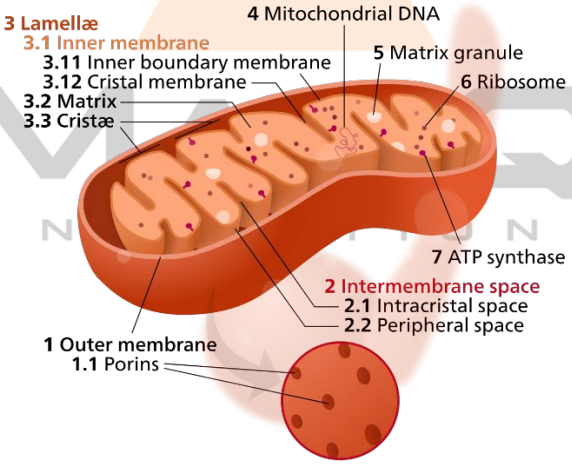
Capsaicinoids and Thermogenesis

Capsaicinoids also increase thermogenesis. Thermogenesis is the production of heat energy that occurs in all tissues. Thermogenesis is a process by which utilizable cellular energy generally used to convert adenosine triphosphate (ADP) to adenosine triphosphate (ATP) is dispersed as heat, and as such, considered ‘wasted’.



It is activated by amplified cellular levels of free fatty acids, which occurs during capsaicinoid consumption, shivering and exercise.[14]

This progression utilizes brown fat and is known as uncoupling. It is regulated by uncoupling protein-1 (UCP1), which is sometimes called thermogenin. It is an uncoupling protein found in the mitochondria of brown fat. It is used to generate heat by non-shivering thermogenesis.



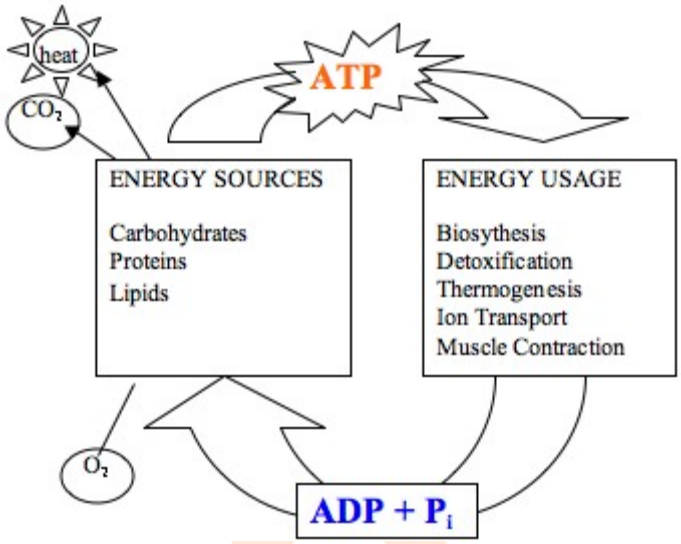
UCP1 is activated in the brown fat cell by fatty acids. Fatty acids are released by thermogenesis. Fatty acids then cause the following signaling cascade: Sympathetic nervous system terminals release norepinephrine onto a Beta-3 adrenergic receptor on the plasma membrane.

This stimulates adenylyl cyclase, which triggers the conversion of ATP to cyclic AMP (cAMP).

cAMP initiates protein kinase A, causing its active C sub-units to be unbound from its regulatory R subunits [33].

Active protein kinase A, activates triacylglycerol lipase by phosphorylating it.

The lipase converts triacylglycerols into free fatty acids, which activate UCP1, overriding the inhibition caused by purine nucleotides (GDP and ADP).



At the conclusion of thermogenesis, the mitochondria oxidize the residual fatty acids until absent, UCP1 inactivates and the cell resumes its normal energy-conserving mode.

Capsaicinoids, in particular, stimulate thermogenesis by activating the sarcoplasmic reticulum Ca+-ATP-ase (SERCA).

Hydrolysis of ATP occurs via SERCA, and in the presence of capsaicinoids, SERCA becomes uncoupled leading to greater energy production, thus activating the thermogenesis process as described above.

Capsaicinoid treatment may also stimulate vasodilation which may add to thermogenesis, as loss of heat imposes a requirement for increased metabolism.

In studies, capsaicin-rich diets have shown advantageous effects on atherosclerosis, cardiac hypertension, hypertrophy, diabetes, metabolic syndrome, non-alcoholic fatty liver, obesity and stroke risk.

STUDIES

Thermogenesis has been shown to raise resting energy expenditure by approximately 50-135 kcal/day and augment metabolic rate in conjunction with exercise and calorie-restricted dieting and exercise.[15,16,17,28]

In one study when capsaicinoids were consumed prior to or with a meal, caloric intake was reduced by around 74 calories [59].

Studies have shown capsaicinoids increase fat oxidation which reduces visceral adipose tissue, increases free fatty acids and glycerol to power beta-oxidation and gluconeogenesis.[8,12]

Numerous studies have confirmed an increase in lipolysis following capsaicinoid intake, including a superior decrease in abdominal adiposity with capsaicinoid intake (6mg per day) compared to placebo when subjects were randomly assigned to either for a period of 12 weeks.

For both resting energy expenditure and fat oxidation, some studies show an increase following ingestion of capsaicinoids.[16,19]

Reductions in body fat have been observed with dosages of capsaicinoids between 2-10 mg/day.[7,18]

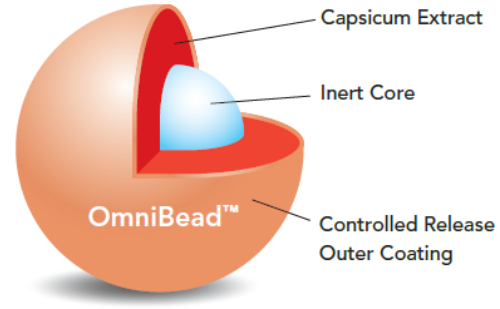
Another study (Bloomer et al.) confirmed amplified circulating free fatty acids and glycerol in healthy men and women with normal weight during a four hour period after ingesting Capsimax® alone compared to a placebo. Doses were 100mg, of which 2mg were pure capsaicinoids.

Studies noted increased energy expenditure and thus increased caloric burn when 30mg daily capsaicinoids was provided along with a standardized high fat and high carbohydrate meals. Greater benefits were shown with high-fat meals [19 Yoshioka].

Capsimax® Has a Patented Omnibead Proven to Relieve Gastric Distress

Gastric distress when consuming capsaicinoids is well documented in studies. Because of the burn, many people may not be able to tolerate capsaicin at the doses required to achieve weight and health benefits. Capsimax® provides a patented solution with studies to support its efficacy.

Capsimax is coated with an OmniBead™ Beadlet Technology. It encapsulates the beneficial heat of concentrated highly-active, natural capsaicin in a controlled release coating, delivering effective levels of capsaicinoids without the oral and gastric burning sensation of unprotected red hot peppers.



For representative purposes only

In all studies, Capsimax® was well tolerated with no issues of oral or gastric upset.[11]

LEANGBB™

Gamma-Butyrobetaine (GBB) is the precursor to L-carnitine production in the body. As such, it increases body's production of L-Carnitine when ingested.

The major sites of L -Carnitine biosynthesis are the liver and kidneys. Biosynthesis necessitates two essential amino acids, protein bound lysine and methionine, plus vitamin C, Vitamin B6, iron and niacin along with a sequence of catalyzed reactions [14].

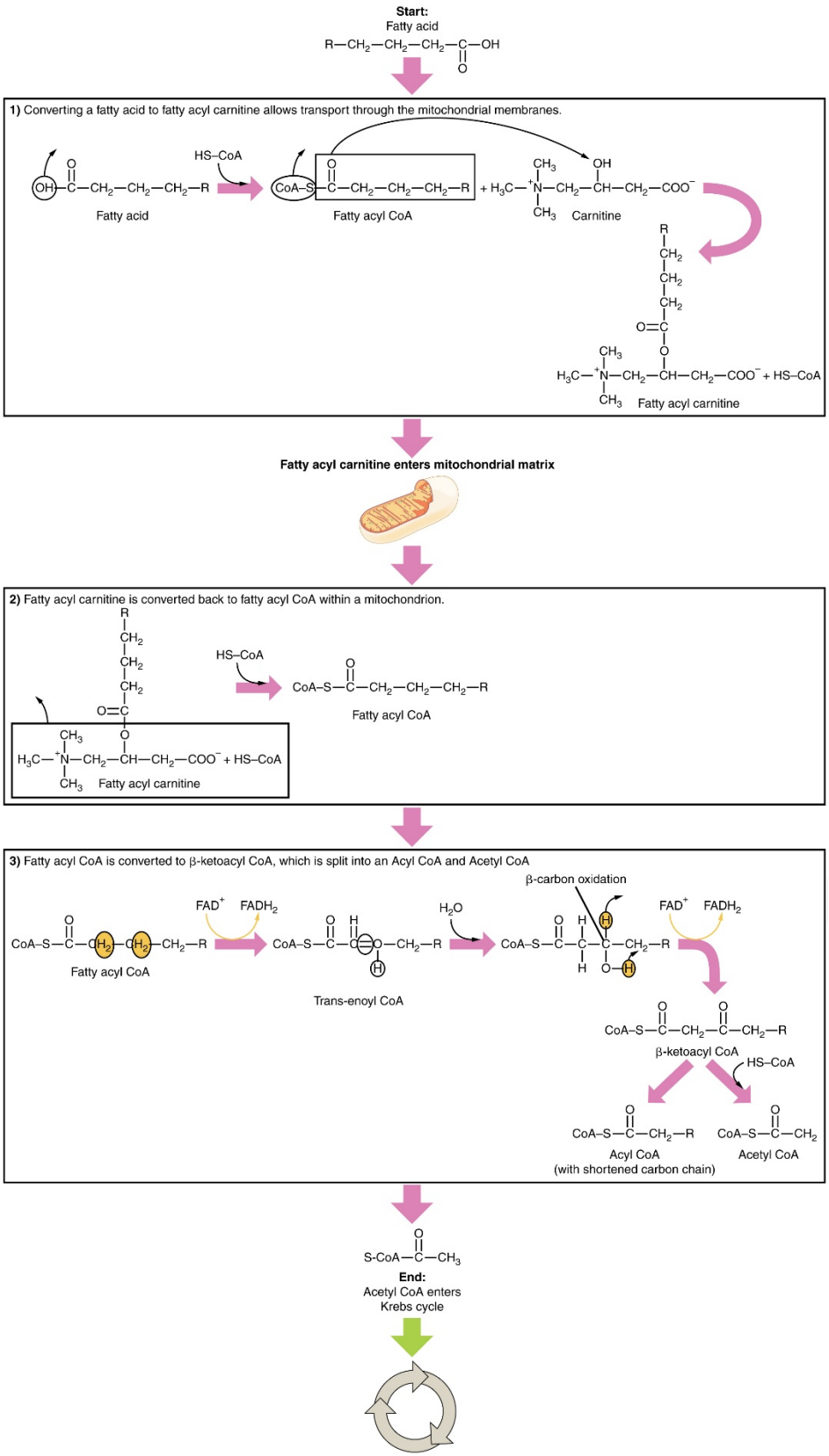
In part, γ-Butyrobetaine hydroxylase (BBOX) acts as the catalyst to convert GBB into l-carnitine, which is implicated in the creation of metabolic energy from long-chain fatty acids.

L-Carnitine is shown to:

- Increase lipolysis.
- Reduce cholesterol.
- Increase energy.

Carnitine is mainly responsible for converting fatty acids into energy.

When the body needs energy, fatty acids are released from very low density lipoprotein (VLDL) and chylomicrons which are transported to cells through the assistance of L-Carnitine. Once they reach the cells, fatty acids require a vehicle to enter mitochondria were b-oxidation takes place. L-Carnitine acts as that vehicle to carry fatty acids across the mitochondrial membranes where they are oxidized for energy [14].

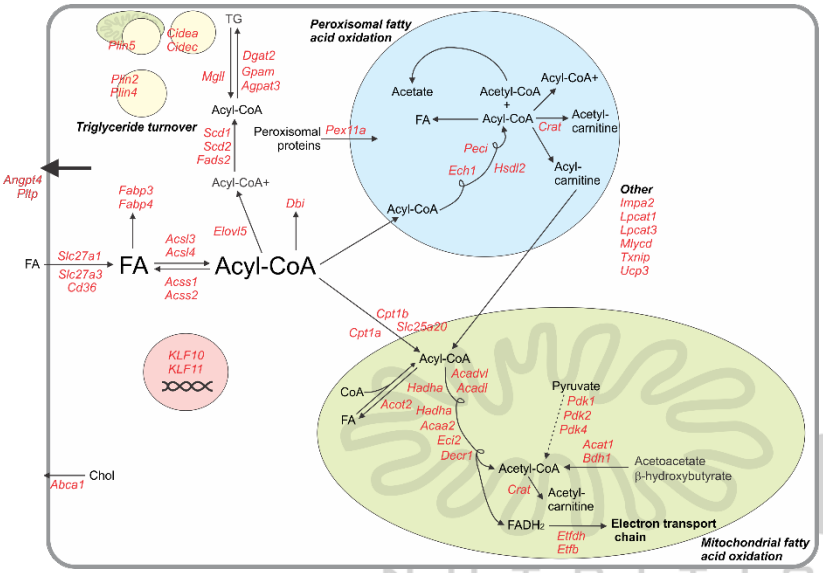

Start:
Fatty acid
1) Converting a fatty acid to fatty acyl carnitine allows transport through the mitochondrial membranes.
HS–CoA
Fatty acid
Fatty acyl CoA
Carnitine
Fatty acyl carnitine
Fatty acyl carnitine enters mitochondrial matrix
2) Fatty acyl carnitine is converted back to fatty acyl CoA within a mitochondrion.
HS–CoA
Fatty acyl CoA
Fatty acyl carnitine
3) Fatty acyl CoA is converted to β-ketoacyl CoA, which is split into an Acyl CoA and Acetyl CoA
β-carbon oxidation
FAD+
FADH2
H2O
Fatty acyl CoA
Trans-enoyl CoA
β-ketoacyl CoA
HS–CoA
Acyl CoA
(with shortened carbon chain)
Acetyl CoA
End:
Acetyl CoA enters
Krebs cycle

<u>Carnitine + acyl – CoA Acyclcarnitine + coA → ← Carnitine + acyl – CoA acylcarninte + CoA</u>

Through this reaction carnitine propels and necessitates mitochondrial fatty acid oxidation [13].

The inner mitochondrial membrane is impermeable to long-chain fatty acyl-CoAs and as such, fatty acids can't gain access to the intramitochondrial site of β-oxidation [13].

As a result of carnintine's reaction, long-chain acylcarnitines produced from the acyl-CoAs are able to cross the mitochondrial membrane, recreating the acyl-CoAs in the mitochondrial matrix, and then are available as substrates for oxidation [13].



Carnitine is concentrated in skeletal and cardiac muscle tissues that utilize fatty acids as fuel.

Carnitine transports long-chain fatty acids into the mitochondria so they can be oxidized. The result is energy. It also transports the toxic compounds generated from the cycle out of the cell to prevent accretion [4].

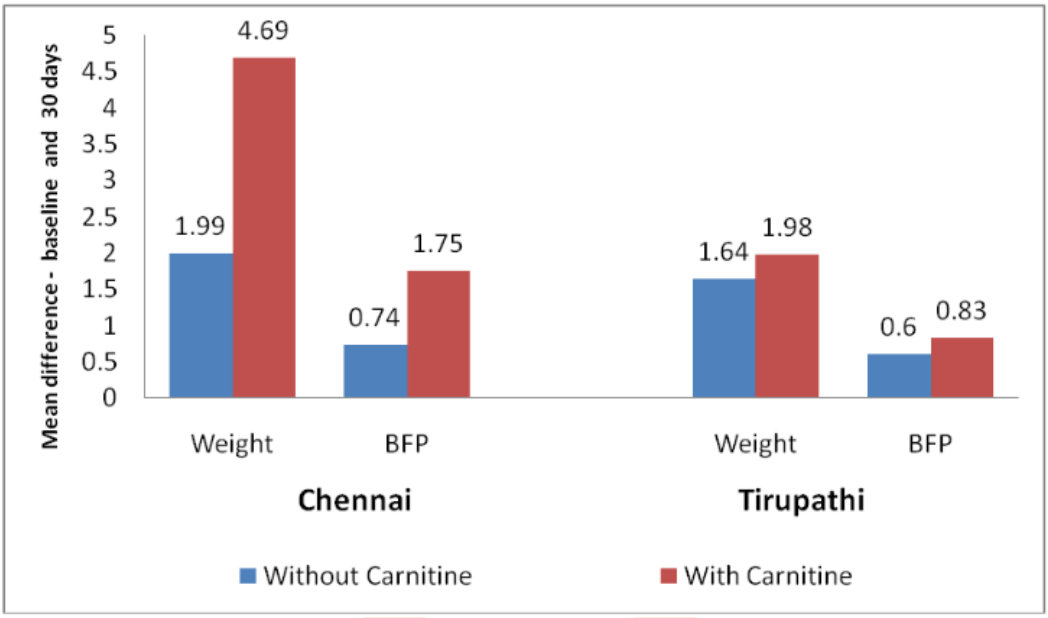
Studies

A meta-analysis review by Pub-Med qualified nine studies to determine the efficacy of carnitine. Trials with mean difference (MD) of 95% confidence interval (CI) were assembled using random effect model. Results uncovered that subjects who supplemented with carnitine lost significantly more weight (MD: -1.33 kg; 95% CI: -2.09 to -0.57) and showed a decrease in body mass index (MD: -0.47 kg m(-2) ; 95% CI: -0.88 to -0.05) compared with the control group. Pub-Med established carnitine resulted in weight loss.[1]

In another study, significant reductions in weight and body fat percentages were lost over 30 days when compared to a placebo group [14].

COMPARISON OF WEIGHT AND BFP WITH RESPECT TO PLACEBO AND EXPERIMENTAL GROUP:

FIGURE 1: DISTRIBUTION OF WEIGHT AND BFP BEFORE AND AFTER L-CARNITINE SUPPLEMENTATION



Dosage

Taking 100 mg of LeanGBB™ is equal to consuming 3,000 mg of carnitine. Studies show it increases carnitine concentrations in the body by up to **300 percent.** [6]

WHITE KIDNEY BEAN EXTRACT

White kidney bean extract acts as an alpha-amylase inhibitor which inhibits digestion of starches. In doing so, calories from starches are not absorbed. This effectively reduces body weight and fat levels as if on a restricted diet.

- Inhibits digestion of starches.
- Reduces fat levels.

- Reduces weight.
- Promotes healthy cholesterol and blood glucose levels.
- Reduces BMI
- Reduces adipose tissue thickness.
- Reduces waist, hip and thigh circumference.
- Maintains lean body mass.

White kidney beans are also shown to prevent or stave off weight gain during binge eating to effectively reduce or prevent weight gain, increased bad cholesterol and blood glucose.

The white kidney bean, phaseolus vulgaris, produces an alpha-amylase inhibitor. Studies show weight loss occurs with doses between 500 mg and 3000 mg per day[1].

Carbohydrates must be broken down into monosaccharides before being absorbed by the body. Amylase and glucosidase are two major enzymes responsible for breaking down carbs[1].

When carbs are consumed, amylase is secreted by salivary glands in the mouth and then by the pancreas in the small intestine. Amylase breaks down the carbs into oligosaccharides. Then glucosidase finalizes the breakdown into monosaccharides. Once carbs are broken down into monosaccharides, the body absorbs them.

Glucose and monosaccharides are transported to the liver, and what is not used for energy is stored as glycogen in the liver for energy or as fat.

White kidney beans prevent starch digestion by fully blocking access to the active site of the alpha-amylase enzyme.

White kidney bean extract works synergistically with **Omnilean**™ because as the white kidney bean extract blocks amylase enzyme, **Omnilean**™ blocks glucosidase ensuring carbs are wholly blocked from absorption.

Studies

A study on 60 slightly overweight subjects over 30 days dosed with 445 mg of white kidney bean extract taken once per day. Subjects were carbohydrate rich diets of 2,000-2,200 calories per day.

After 30 days, subjects had significantly greater reduction of adipose tissue thickness, body weight, BMI, fat mass, and waist/hip/ thigh circumferences. They also maintained lean body mass compared to placebo.

Table 4

Effect of Phaseolus vulgaris-containing extract *vs.* control dietary supplement on the body composition of overweight subjects

Measured Parameter	Test (n=30)	Control (n=29)	p-value
Body weight (kg)	-2.93 ± 1.16	-0.35 ± 0.38	<0.001
Fat mass (kg)	-2.4 ± 0.67	-0.16 ± 0.33	<0.001
Lean body mass (kg)	-0.53 ±0.45	-0.19 ± 0.17	<0.05
Waist circumference (cm)	-2.93 ± 2.13	-0.47 ± 0.39	<0.001
Hip circumference (cm)	-1.48 ± 0.66	-0.10 ± 0.47	<0.001
Thigh (right) circumference (cm)	-0.95 ± 0.80	-0.26 ± 0.46	<0.001
Adipose tissue thickness (*via* skin echogram) (mm)	-4.2 ± 6.51	-0.66 ± 2.81	<0.001

(Source)

The group lost on average, 6.6 pounds in body weight, 6 pounds of fat mass, 1.25 inches from the waist, and 1 inch from the hips.

In another study, white kidney bean extract was shown to decrease digestion of dietary starch.

In another study, it completely inhibited amylase activity [2].

An additional study showed subjects ingested 50 g rice starch and on the next day they ingested starch with 5 g or 10 g white bean extract. The white bean extract significantly reduced amylase activity by more than 95 percent. Acting within fifteen minutes and lasting up to two hours it also:

- Increased delivery of carbs to small bowel by 22-24 percent.
- Increased hydrogen concentration in breath from 30-90 minutes post-meal (indicator of carb malabsorption).
- Reduced post-meal blood sugar by 85 percent.
- Decreased post-meal blood insulin levels. [2].

In a longer-term study over three weeks, subjects were given white kidney bean extract reducing blood sugar levels more than thirty percent with a dose of four to six grams per meal. [2]

In some studies, diarrhea and gastrointestinal symptoms occurred the first day of administration but resolved after taking over the course of a few days.

HMB

β-Hydroxy β-Methylbutyrate (HMB) is a metabolite of the amino acid leucine and preserves muscle mass.

During weight loss, muscle mass is also lost. HMB lowers muscle proteolysis following resistance training, and increases gains in lean body mass and strength.[1]

Proteolysis is the breakdown of proteins into smaller polypeptides or amino acids.

Studies show during weight loss muscle protein break down increases and loss of muscle mass results.

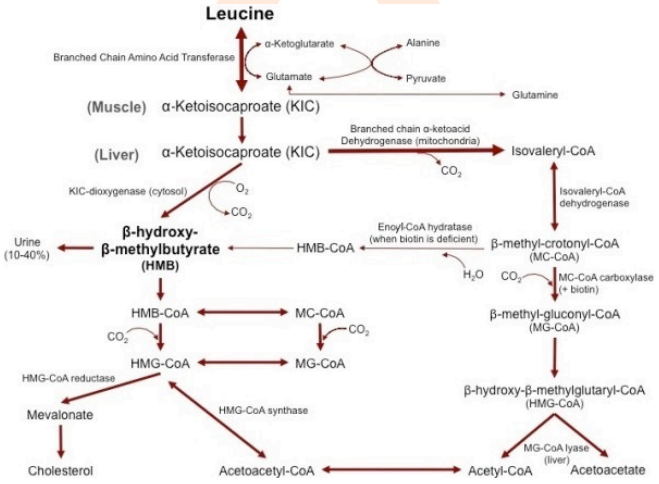
As such the benefits of weight loss can come with the detriments of muscle loss.

Leucine plays a key role in protein metabolism, glucose homeostasis, insulin response and training recovery [1].

Leucine's anti-catabolic properties are well documented [8].

When consumed, leucine is transaminated into alpha-ketoisocaproic acid (KIC) [9]. Transamination is a chemical reaction that transfers an amino group to a ketoacid to form new amino acids. KIC reduces muscle breakdown [10].

After leucine is transaminated into KIC, KIC is then converted to isovaleryl-CoA by the enzyme a-ketoacid dehydrogenase in the mitochondria, or into HMB in the cytosol, by the enzyme a-ketoisocaproate dioxygenase [9].

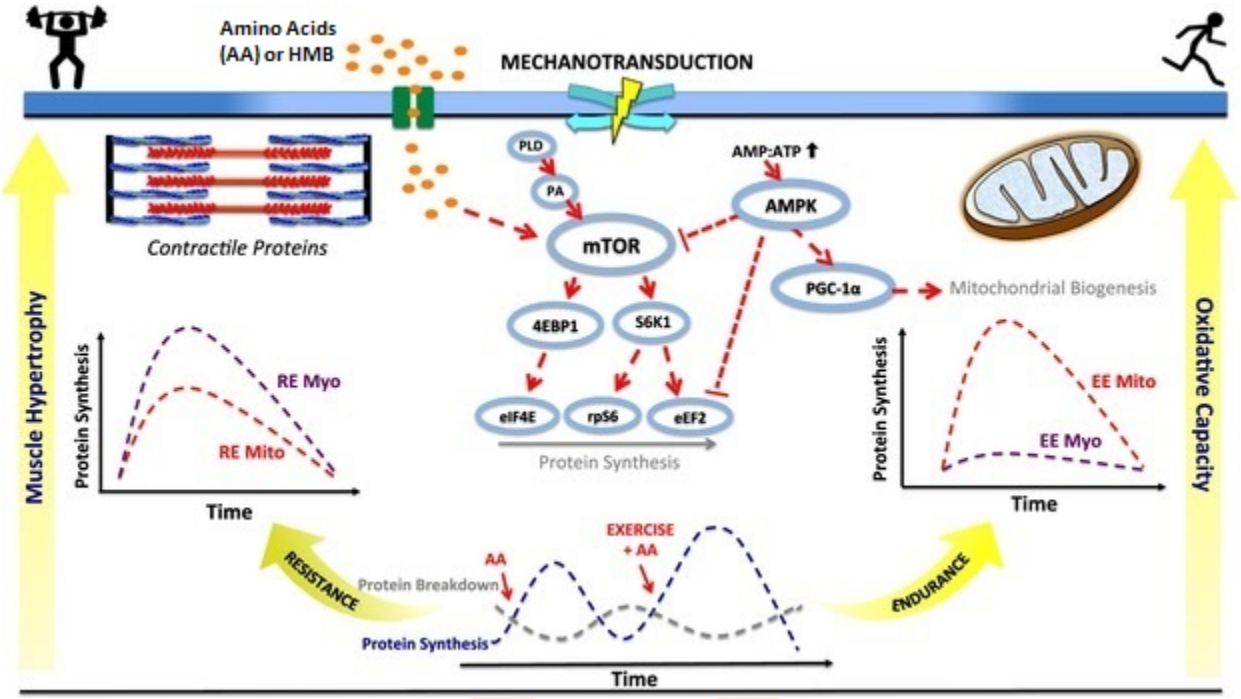


Approximately five percent of leucine is metabolized into HMB [9]. As such, to reap the benefits of HMB, 60 grams of leucine would be needed to harvest the studied and recommended dosage of 3 grams of HMB from the metabolic process.

HMB:

- Increases lean body mass.
- Is anti-catabolic.
- Is anabolic.
- Increases lipolysis.
- Increases nitrogen retention.
- Decreases bad cholesterol.

- Increases aerobic capacity of muscles.
- Enhances immune response. [18-24]



Studies

In a study on muscle metabolism and performance, subjects took 0, 1.5 grams or 3 grams of HMB daily. Subjects strength trained 3 times per week. Results showed reduced muscle damage, protein degradation and increases in lean body mass with most marked results at 3 gram doses. [37]

In another study over 7 weeks, lean body mass was significantly increased and strength markedly increased with a tolerated 15 pound increase in weights on bench press.[37]

HMB decreases body fat by more than twice the rate of non supplemented subjects (-1.1% *vs.* -.5%) and increased lean body mass (1.4 vs. .9 kg) in studies with a 55 percent increase in bench press performance. [39]

Strength was increased more than triple-fold in one study showing leg extension power increased from 4.8 percent to 14.7 percent after 9 weeks of strength training. [40]

In a meta-analysis study for supplements claiming to increase lean body mass and strength, studies between 1967 and 2001 were reviewed. 250 supplements were reviewed, only 6 met the qualifying criteria and only creatine and HMB had adequate evidence to support increases in lean body mass and strength. [42]

Dosage

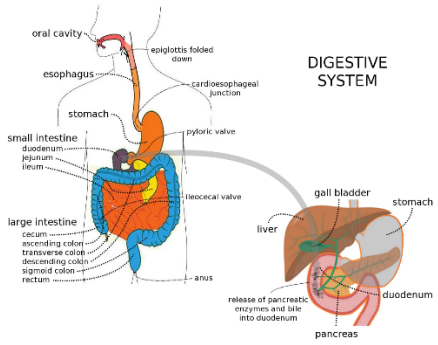
Most studies advise taking 3 grams of HMB daily. [32,37,42,44]

DIGESEB™

DigeSEB™ is an advanced blend of food grade digestive enzymes from non-animal sources. As a digestive enzyme, it is formulated to aid in the digestion of fats, carbohydrates and proteins. The comprehensive combination of **Amylase** (carb break down), **Cellulase** (fiber break down), **Lactase** (dairy breakdown), **Lipase** (fat breakdown), **Protease** (protein breakdown) helps the body break down foods in the gastrointestinal tract to combat indigestion, bloating, abdominal discomfort and gas.

Amylase, Cellulase and Lactase digest complex sugars, starches and non-starch polysaccharides [1].

DigeSEB formula contains an acid stable Lipase derived from plant sources that is significantly more effective than pancreatin in digestion of lipids[1]. Its protease hydrolyzes proteins into smaller peptides and free amino acids.



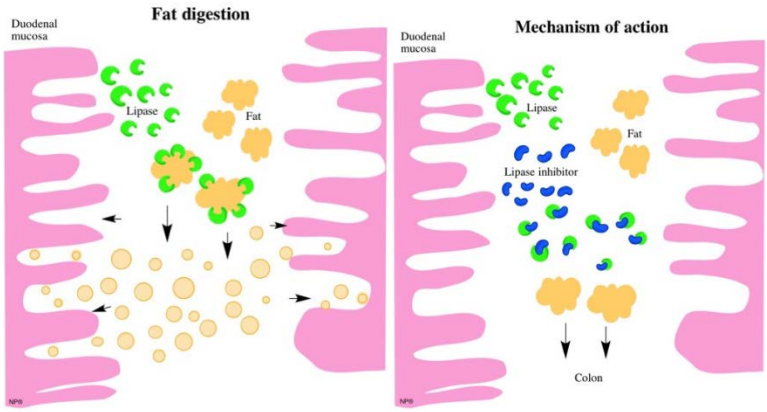
DigeSEB :

- Aids in digestion of carbs, fiber, dairy, fat and protein.
- Relives digestive discomfort through aiding in digestion.
- Has broad specificity for legumes, milk, soy, cereal grains, meat and other foods.
- Is effective in a pH range of 3 to 9, which allows it to work throughout the wide variations in pH in the digestive tract.

Lipase Breaks down Fat

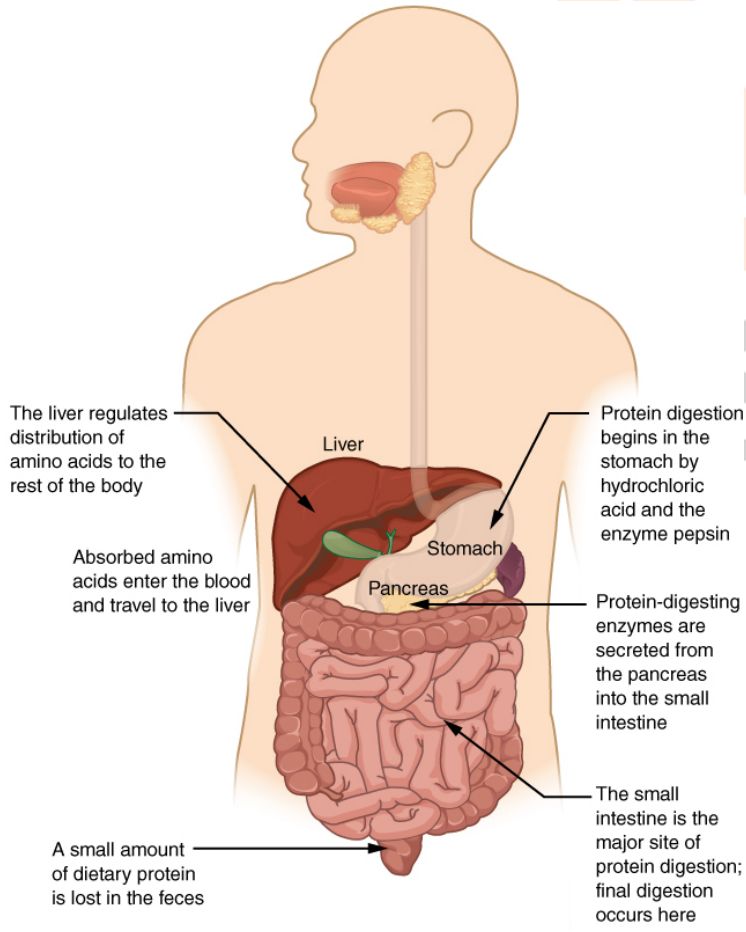
Lipase carries out an essential role in the digestion, transport and processing of fats..

Lipase catalyzes the hydrolysis of fats by converting trigluceride substrates in oils into monoglycerides and fatty acids.



Protease Breaks Down Protein

Protease carries out proteolysis which is the breaking down of protein through by hydrolysis of peptide bonds.



Lactase Breaks Down Dairy

Lactase is necessary to the digestion of whole milk. It breaks down lactose, the sugar responsible for giving milk its sweet taste.

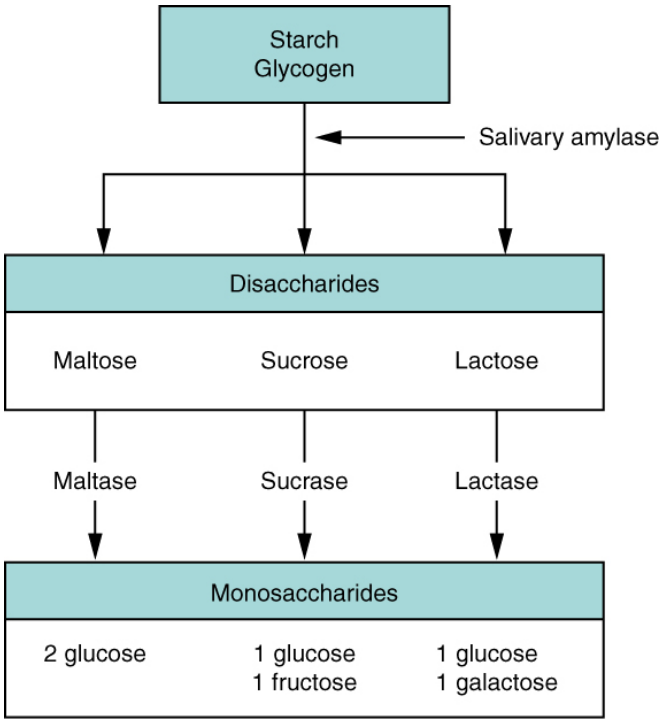
Lactase hydrolyzes disaccharide lactose into galactose and glucose molecules.

Cellulase Breaks Down Fiber

Cellulase breaks down the fiber into monosaccharides. Fiber is often difficult to digest and its consumption results in digestive issues like bloating and gas.

Amylase Breaks Down Carbohydrates

Amylase is produced in the pancreas and salivary glands to break down starch into disaccharides and trisaccharides.



DigesSEB is a Synergistic Ingredient of Capsilean

DigeSEB is a synergistic ingredient in Capsilean's formula. With Omnilean and white kidney bean extract having some digestive side effects like bloating and gas, due to undigested carbohydrates, DigeSEB reduces the effects with enzymatic resolve.

Studies

In a double-blind trial a timed-release form of enzymes were given to subjects to consume before and after a meal. Three capsules were taken by each subject totaling 30,000 USP units of lipase,

112,500 USP units of protease, and 99,600 USP units of amylase. The results showed significantly reduced bloating, gas and fullness after consuming a high-fat meal.

Studies also show that in people who are healthy or afflicted by gastrointestinal disease, supplementation with digestive enzymes increases digestion and improves bioavailability of carbs and proteins.

BIOPERINE™

BioPerine® is a patented extract obtained from black pepper fruits and is used as a bioavailability enhancer to improve nutrient absorption by at least 30%[0].

BioPerine® is a patented extract obtained from black pepper fruits (*Piper nigrum*) standardized minimum to 95% Piperine.

Increasing absorption of a drug or nutrient can increase its therapeutic benefits and reduce the overall dose necessary to deliver those benefits.

Poorly bioavailable drugs aren't effective because a large portion of a dose will not reach the blood to release benefits without very large doses. These larger doses pose side effects that can be serious.
The discovery of piperine in 1979 as a bioavailability enhancer changed the perception of absorption and efficacy.

Piperine interacts with enzymes that partake in metabolism of supplements and drugs. Because each drug varies in the way the body metabolizes it, piperine works differently for each drug. In part, it interacts with oxidative phosphorylation processes and metabolic pathways to slow down the metabolism and biodegradation of drugs. It stimulates absorption by exciting gut amino acid transporters, hinders the cell pump in control of drug elimination from cells and impedes intestinal production of glucuronic acid. As a result, higher levels of the drug make it to the blood and more bioavailable [66].

Studies

Piperine was found to increase bioavailability of various drugs ranging from 30 percent to 200 percent[66].

Research has shown that piperine increases curcumin bioavailability by nearly ten-fold [66].

A study evaluated the effect of 20 mg piperine on carbamazepine in doses of 300 mg and 500 mg. Results showed that piperine significantly increased the mean plasma concentrations of carbamazepine in both groups of doses [38].

Results of one study in rats showed piperine increases the oral exposure of fexofenadine by 180 percent to 190 percent and bioavailability by ~200 percent.

In another study on piperine and curcumin bioavailability, subjects were given a dose 20 mg/kg and 20 mg showing an increase in bioavailability of 2000 percent[41].

In a crossover, placebo-controlled study subjects were given piperine 20mg or placebo each morning for 6 days, and on day 7, nevirapine 200mg plus piperine 20mg or nevirapine plus placebo. Results showed values of nevirapine were increased by 120 percent to 170 percent [42].

In a study on metronidazole and piperine, increases of 57 percent and 88.53 percent in peak plasma levels and AUC respectively of metronidazole were shown.

Another study reviewed piperine's impact on resveratrol of 100 mg/kg in mice. Results showed resveratrol was enhanced to 229 percent and the maximum serum concentration increased to 1544 percent[51].

Dose

Studies show bioenhancement activity at 15 -20 mg total piperine per day[61].

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