

10 FOODS THAT FIGHT VISCERAL BELLY FAT



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In 1947, French professor and physician Jean Vague first reported in a French medical journal clinical observations that patients with a host of health issues (e.g., hypertension, gout, diabetes) were not necessarily more obese than his patients without such complications.¹ Despite not having access to sophisticated tools, Vague identified two different body shapes representing two distinct ends of the obesity spectrum:

- *Android obesity*, which refers to excess fat stored preferentially in the trunk/ upper body area. It's this pattern of fat storage that Vague identified being closely associated with diabetes and heart disease.
- *Gynoid obesity*, which refers to preferential fat storage in the hips and thighs. This is frequently described as female obesity, and it is less associated with the complications of android obesity.

Android and gynoid obesities have also been commonly referred to as “apple and pear shape” obesities, respectively, in the lay press and media. About 10 years later, Vague went on to summarize his work in paper published in English in the prestigious journal *The American Journal of Clinical Nutrition*.² Vague's work was met with intense skepticism by the medical community. Fast forward decades later, Vague's seminal contribution is now finally being recognized, and hundreds of studies now support the notion that body fat storage patterns (i.e., body fat topography) is a critical indicator of cardiometabolic health.

The mid-1980s are considered a “renaissance” period during which time body fat distribution truly became the focus of interest of obesity researchers. For instance, a group of researchers from Sweden reported that body fat topography and body shape were key factors related to metabolic complications. They also reported, for the first time, that the ratio of abdominal waist over hip circumferences (i.e., waist-to-hip ratio, WHR) was a simple index of body fat distribution. Along those lines, they reported that

an increased WHR (i.e., android obesity) was predictive of coronary heart disease, and they also went on to report that men with a high proportion of body fat were at a significantly greater risk for the development of diabetes.³⁻⁶

During this time, Ahmed Kissebah and his team from the University of Wisconsin in Milwaukee published several papers that were fully in line with the observations of the Swedish researchers showing that the proportion of abdominal belly fat, estimated using the WHF, was predictive of metabolic abnormalities increasing the risk of both type 2 diabetes and cardiovascular disease. These two research groups led the field of obesity research providing early evidence that body fat storage patterns (assessed by simple methods such as WHR) were a key predictor of metabolic abnormalities and health risks.⁷

Despite an explosion in obesity research and tremendous advances in technology, the problem has only gotten worse. In a study jointly conducted in 2010, the International Association for the Study of Obesity (IASO) and the International Obesity Task Force (IOTF) estimated that approximately 1.5 BILLION people across the globe are overweight, with over 475 million obese adults.⁸

According to the World Health Organization (WHO), the prevalence of overweight and obesity has further increased since the IASO/IOTF report was published just a few short years ago. In fact, the WHO reports that, in 2014, over 1.9 BILLION folks across the world are overweight, with over 600 million of those folks being classified as obese.⁹ That's over a 25% increase in obesity in less than 5 years.

According to data from the National Health and Nutrition Examination Survey, 2 out of every 3 adults in the United States are overweight or obese, and over one-third of the adult population is obese.¹⁰

In general, obesity is a substantial, independent risk factor for cardiovascular disease, and it's associated with diabetes, high blood pressure, sleep apnea, and a host of metabolic issues.¹¹ Research has shown that storing excess visceral belly fat, referred to as abdominal obesity, is associated with a constellation of metabolic alterations and health conditions including ^{7,12,13}:

- Insulin resistance and type 2 diabetes

- High triglycerides (e.g., high VLDL₁ and VLDL₂)
- Low levels of large HDL₂ particles (the so-called “good” cholesterol)
- High levels of small, dense LDL particles (small, dense particles are considered more detrimental than large, fluffy particles¹⁵)
- High levels of apolipoprotein B (which is considered a better predictor of cardiovascular risk than the more commonly used LDL¹⁴)
- Cardiovascular disease
- Hypertension
- Certain cancers
- Sleep apnea
- Metabolic syndrome
- Unhealthy levels of inflammation
- Leptin resistance

The Skinny on Skinny Fat

There’s a common misconception that body weight is a reliable and accurate depiction of health. However, the number on a scale says very little about one’s level of fitness, body fatness, fat storage patterns, and levels of lean body mass.

Typically, an “ideal” or “normal” weight is calculated as a ratio of body weight to height. The most commonly used tool is called the Body Mass Index (BMI), which is a person’s weight (in kilograms) divided by his/her height (in meters) squared (i.e., kg/m²). Using this ratio, the BMI separates folks into the following categories:

- Underweight (BMI < 18.5)
- Normal weight (BMI 18.5 – 24.9)
- Overweight (BMI 25 – 29.9)
- Obese (BMI > 30)

Hence, the notion of “normal” weight is born, but as mentioned above, there are many limitations associated with the BMI and using this avenue to assess health and fitness. Along those lines, recent research suggests that *where* folks store body fat—even if they fit into the “normal weight” category—may drastically increase their risk of disease and death.

In a study published in the journal *Annals of Internal Medicine*, a group of researchers led by Dr. Francisco Lopez-Jimenez, director of preventive cardiology at the Mayo Clinic, examined 14 years worth of data including over 15,000 study participants to determine the potential connection between “normal-weight obesity” and the risk of cardiovascular disease and death. They found that folks who are “normal weight” but store an excessive amount of fat in their mid-sections were more than twice as likely to die from cardiovascular disease compared to “obese” people whose body fat was more equally distributed throughout their bodies.¹⁶

To put the increased risk of disease and death into perspective, Dr. Lopez-Jimenez said, “Being normal weight with mid-section obesity is comparable to smoking a half to a full pack of cigarettes daily.”

A number of important lessons and practical applications can be gleaned from this research and information. For one, it’s possible to be “normal weight” *and* “metabolically obese,” which Dr. Lopez-Jimenez and colleagues¹³ have defined as having:

- **Normal** BMI
- **High** visceral fat
- **High** body fat percentage
- **Low** muscle mass
- **Reduced** insulin sensitivity
- **High** blood sugar
- **High** triglycerides
- **Reduced** HDL cholesterol

Conversely, it’s possible to be “obese” yet “metabolically healthy,” which involves increased levels of body fat, low levels of visceral fat, a normal metabolic profile, and high insulin sensitivity. Some refer to this as “fit but fat.”

Secondly, using a ratio of body weight to height (i.e., BMI) can be a relatively poor indicator of health and fitness. With that in mind, it’s important to use other measurements to determine health risk. While body composition testing (i.e., ratio of fat to lean mass) is arguably the most accurate means to discern health status, using waist circumference and waist-hip ratios may be alternative options.^{17–19}

In general, women who have a waist circumference greater than 35 inches and men whose waist measurement is 40 inches or more are considered to have “central obesity” and be at “substantially increased” risk for cardiovascular disease and metabolic complications. With that said, according to the World Health Organization (WHO), women with a waist circumference greater than 31.5 inches and men with a waist circumference greater than 37 inches are at an “increased” risk for metabolic complications.²⁰

Some research suggests that waist-hip ratio may be an even better predictor of health risk than waist circumference. According to the WHO and other professional health organizations, abdominal obesity is defined as a waist–hip ratio of 0.85 for females and 0.9 or more for men, and folks that fit into these categories are considered to be at “substantially increased” health risk because of their fat distribution.^{20,21}

There appears to be a number of factors that contribute to excessive storage of belly fat, including some that may be out of your control, including⁷:

- Age
- Gender (e.g., men are more likely to accumulate fat in the android pattern)
- Sex hormones (e.g., low testosterone in males is associated with increased visceral belly fat) [Note that sex hormones may be modified by lifestyle and behavioral factors.]
- Genetics
- Ethnicity (e.g., African-American and Hispanic populations seem to be at a higher risk)
- Central and peripheral nervous systems (e.g., endocannabinoid system)

Having said that, there are several modifiable lifestyle and behavioral factors, well within your control, that can be addressed to prevent the accumulation of and/or reduce the amount of existing visceral fat.

Exercise

A sedentary lifestyle, an overall lack of physical activity, and low levels of fitness are associated with abdominal obesity. As mentioned above, it should be noted that “normal-weight obesity” is typically associated with lower levels of muscle mass. This is

often described as being “skinny fat.”

Fortunately, a number of studies have examined the impact of exercise on visceral fat, and while the exact amount (i.e., volume) and intensity is still being investigated, a substantial body of evidence suggests that a combination of resistance training and aerobic conditioning (including moderate and intense cardiovascular activity) may be optimal to reduce/attenuate abdominal obesity.^{22–25} The additional advantage to including resistance training is that it is the primary means by which to increase muscle mass, and it is also very effective at improving carbohydrate tolerance and insulin sensitivity.^{26,27}

According to the American College of Sports Medicine (ACSM), a combination of moderate- to high-intensity exercise performed for a total of at least 250 minutes per week (i.e., 5 – 6 days of 45 – 60 minutes of exercise) is associated with significant weight loss.²⁸

Stress Management

Excessive stress or the inability to cope with stress may also be a contributing factor to central obesity. From a body composition standpoint, stress has been associated with weight gain, which it may drive through multiple pathways^{29,30}:

1. Through eating behaviors and diet quality
2. Through biological processes

With regard to the latter, excess stress or the inability to cope with stress may contribute to storing excess belly fat (i.e., visceral fat). You may be familiar with the “stress hormone” cortisol, which appears to have a direct connection to fat accumulation, and in particular, abdominal fat.

Studies have shown that folks with high waist-hip ratios tend to have poor coping skills and secrete more cortisol when faced with a stressful situation. This suggests a relationship between cortisol and abdominal fat accumulation, and additional studies have identified a similar association between cortisol concentrations, coping skills, chronic stress, and excess belly fat.^{31,32}

There are a number of potential explanations for the stress-cortisol-belly fat connection.

For instance, the enzyme (i.e., HSD) that “activates” cortisol from its inactive form (i.e., cortisone) is more prevalent in visceral fat than subcutaneous fat tissue.³³ What’s more, visceral fat tissue has greater blood flow and four times as many cortisol receptors (compared to subcutaneous).³² Even more, research shows that cortisol increases lipogenesis, which is the process of fat synthesis and storage.³⁴

It’s important to note that the hormone cortisol is not inherently “bad.” In fact, it serves very important physiological function. In the short-term, along with the catecholamines, cortisol is essential for adaptation, homeostasis, and survival.³⁵ For instance, cortisol (which belongs to the glucocorticoid family of hormones) has a profound effect on blood sugar regulation, as its role is to liberate glucose when blood sugar levels are low. Obviously, that would be very important during acute periods of stress when energy is needed (e.g., fasting, exercise).

However, issues arise when stress is long-lasting, which can have damaging effects on the body and health. In excess, cortisol can negatively impact cardiovascular health, body weight, energy levels, and wellbeing.

The impact of stress on eating behaviors and diet quality is a profound one, and stress has been associated with higher caloric intake, increased saturated fat and sugar consumption, and poor diet quality.³⁰

“Emotional eating” is defined as eating to relieve negative emotions (e.g., unhappiness, anxiety, or anger), and stress has been well documented as a key negative emotion involved in emotional eating.³⁶ Emotional eaters typically consume more calories, they eat more frequently, and they indulge in greater amounts of highly palatable, high-calorie, sweet, high-fat foods in response to emotional stress.^{37–40}

It’s no secret that stress can be a “trigger” for overeating. In fact, research shows that around 70% of individuals increase their food intake during periods of stress.^{41,42} Females, overweight individuals, and folks who think about food or body weight obsessively are more likely to eat when stressed.⁴³

As one might expect, research also shows that stress-induced eating typically involves a predisposition for high-sugar and high-fat foods, which are “comfort foods” known to

provide strong rewarding effects and reinforce snacking.⁴⁴

Studies have shown that emotional eaters may try to regulate the negative emotions caused by everyday life through eating behavior, and while their chosen “foods” may provide short-term “comfort” from stress, they also drive appetite for these unhealthy foods at the same time, which ups the risk of weight gain. The benefits on mood may be fleeting, but for most people, the short-lived feelings of wellbeing may be sufficient to promote repeated attempts to boost mood through stress eating patterns.⁴⁵

This pattern of stress-induced, emotional eating creates a negative, vicious, perpetuating cycle of overeating and weight gain, followed by restriction, which again leads to overeating and weight gain.^{43,46,47}

It’s worth noting that there are a number of factors that can contribute to the stress equation—and subsequently, influence the release of cortisol—including psychosocial stressors, food intake, sleep quality and quantity, exercise, and more. Thus, it’s a good idea to examine your overall “stress web” to identify how various domains (e.g., physical, mental, emotional, environmental, financial, spiritual) may contribute to your overall stress levels (i.e., allostatic load).

Stress management can be tricky, but there are a number of things that you can start practicing daily that can all contribute to healthy stress levels:

1. Yoga has been shown to exert powerful “anti-stress” effects and cortisol-reducing capabilities.^{48,49}
2. Mindfulness meditation, which is a form of meditation where you focus your awareness on your breathing and body in the present moment, has been shown to lower both stress and cortisol levels.⁵⁰
3. Regular physical activity, managing finances, and healthy relationships can all contribute to healthy stress levels.
4. *Shinrin-yoku*, which is also known as “forest bathing,” typically involves taking a leisurely walk in nature. Forest bathing is commonly practiced for the purpose of relaxation and stress management, and studies show that it can reduce sympathetic nervous system activity (i.e., fight or flight), increase parasympathetic nervous system activity (i.e., rest and digest), and lower cortisol levels.^{51,52}

In addition, there may be certain dietary supplements that can help reduce cortisol and lower stress. While herbalists have known this for centuries, more and more research suggests that certain herbs (i.e., adaptogens) may be helpful in combating cortisol and improving stress levels. For instance, [Rhodiola rosea](#) has been shown to decrease cortisol levels, exert an anti-fatigue effect, increase the ability to concentrate, and lower stress.⁵³ Another adaptogenic herb, [Ashwagandha](#) has been shown to have a dramatic cortisol lowering effect.⁵⁴

Brings whole new meaning to the phrase, “Take a chill pill,” doesn’t it?

Nutrition

Not surprisingly, nutrition behaviors and food intake appear to have a direct impact on central obesity, and what’s more, studies that combine regular physical activity with diet interventions (i.e., resistance and/or aerobic exercise PLUS a reduced-calorie diet) result in even more significant reductions in visceral fat than either individually.^{22,55} As cited above, poor insulin sensitivity and carbohydrate tolerance coincide with excessive abdominal obesity, and there’s evidence to suggest that diets rich in refined carbohydrates (e.g., sugar-sweetened beverages) may selectively promote the storage of belly fat.^{56,57}

In addition, excessive consumption of saturated fats also appears to be linked to visceral fat storage.⁵⁸ Conversely, researchers have shown that replacing saturated fats with more monounsaturated fats (i.e., Mediterranean diet) prevents visceral belly fat gain despite consuming an equal number of calories. Additionally, adherence to the Mediterranean diet has been shown to be associated with lower waist circumference values independent of body weight in both men and women.^{59,60}

Perhaps overtly obvious, long-term energy excess (i.e., overconsumption of calories) also leads to increases in overall body fatness and increases in abdominal obesity, and along those lines, research suggests that reduced-calorie diets (regardless of macronutrient composition) are effective at decreasing abdominal obesity.^{61,62} With that said, there is evidence that higher-protein (i.e., > 0.5 grams of protein per pound of body weight per day), “controlled carbohydrate” (i.e., <40% of calories from carbohydrate) reduced-calorie diets may be more effective at reducing visceral fat.^{63–66}

While overall nutritional factors like those outlined above seem to play a role, it's a bit less clear as to whether body fat distribution patterns can be influenced by specific foods/nutrients. Having said that, the following lists of foods can be a solid foundation to be used along with an overall healthy diet, regular physical activity, and routine stress management strategies to help fight visceral belly fat.

1. Cold-Water Fatty Fish

Cold-water, fatty fish (e.g., salmon, mackerel, herring, anchovies, sardines) are rich in omega-3 fatty acids, which boost mood and ease anxiety and stress.

In one study, researchers from France evaluated the effects of supplementation with omega-3 fatty acids on the stimulation of the sympathetic nervous system and stress hormones. They found that three weeks of omega-3 supplementation significantly blunted cortisol and sympathetic nervous system activity when participants were challenged with a mental task.⁶⁷



In a randomized controlled trial published in the *Journal of the International Society of Sports Nutrition*, researchers from Gettysburg College assessed the effects of supplementation with omega-3 fatty acids on cortisol levels. After 6 weeks of supplementation, they found that participants' levels of cortisol were reduced. Not only that, participants who supplemented with fish oil also significantly reduced body fat and increased calorie-burning lean mass.⁶⁸

As previously noted, chronically elevated levels of cortisol may specifically contribute to abdominal obesity. What's more, elevated cortisol levels have been shown to be positively associated with abdominal sagittal (waist) diameter and waist-to-hip ratio, two indicators of visceral fat and abdominal obesity.⁶⁹

According to a review study published in the journal *Nutrients*, South Australian researchers concluded that there is "considerable" evidence from animal studies indicating that supplementation with omega-3 fats (i.e., EPA, DHA) can reduce body fat, in particular visceral belly fat.⁷⁰ The researchers cited several studies where omega-3 fats had a protective effect against fat accumulation. In other words, in studies

where animals overfed high-fat, high-calorie diets supplemented with omega-3s, they experienced significantly less belly fat accumulation compared to without.

That's great, but what about humans like you and I? Good news. There is indeed evidence—and it's growing to boot—indicating that increasing the intake of omega-3 fatty acids (by 0.3 – 3.0 grams per day) can reduce body fat, particularly abdominal fat, in overweight and obese folks.

For instance, in a study published in *The American Journal of Clinical Nutrition*, researchers from Spain found that abdominal obesity was inversely related to the omega-3 (particularly DHA) intake.⁷¹ In a follow-up study, the researchers found that omega-3 intake was inversely related to the size of fat cells in overweight and obese adults.⁷² Taken together, these findings suggest that a higher omega-3 intake is associated with reduced visceral belly fat as a result of a decrease in the size of fat cells.

In a randomized controlled trial published in the journal *International Journal of Obesity*, researchers from Iceland investigated the effects of including seafood and fish oil as part of a reduced-calorie diet on weight loss in young overweight adults. The researchers found that the addition of fatty fish (5.3 ounces of salmon 3 times per week) or fish oil (1.5g of EPA and DHA per day) for 8 weeks resulted in significantly greater weight loss and reductions in waist circumference (i.e., visceral fat) compared to diet alone (without the addition of omega-3 fats).⁷³

Even more compelling, a recent meta-analysis of randomized controlled trials published in the journal *PLoS One* provides additional evidence that omega-3 fats may reduce visceral belly fat.⁷⁴ For instance, 8 studies (including 624 participants) investigated the effects of fish oil supplementation on waist circumference combined with a weight-loss program (e.g., diet, exercise). The results demonstrated that fish oil had a significant additional effect in reducing waist circumference, a measure of abdominal obesity, in combination with a weight-loss program.

In other words, fish oil plus diet and/or exercise had a greater effect than diet and/or exercise alone. What's more, this comprehensive review also found that fish oil supplementation had a significant effect on waist-to-hip ratio, another important metric of visceral fat and overall health. The results of 17 different studies (with over 1,000

participants) showed that supplementation with omega-3 fats significantly reduces waist-to-hip ratio both as standalone treatment and when combined with a weight-loss program.

Taken together, the researchers concluded that folks “may benefit from reducing abdominal fat with fish oil supplementation especially when combined with life modification intervention” (e.g., diet and exercise).⁷⁴

2. Pasture-Raised Meat & Eggs

When it comes to fat loss, there’s arguably not a generally more effective nutrition strategy than optimizing protein intake. Research illustrates quite clearly and convincingly that increasing dietary protein intake to at least TWICE the RDA (i.e., $\geq 1.6\text{g}/\text{kg}$ or $0.72\text{g}/\text{lb}$) may be “metabolically advantageous,” particularly for individuals looking to improve body composition as well as physically active folks.⁷⁵



Higher protein diets have been shown to:

- Accelerate fat loss *and* spare lean body mass while following a reduced-calorie diet.^{76,77}
- Attenuate weight regain and contribute to long-term weight maintenance.⁷⁸
- Optimize 24-hour muscle protein synthesis and facilitate the maintenance or building of muscle mass, which is critical for preserving metabolic rate and preventing weight regain.^{79,80}
- Boost metabolic rate.^{81,82}
- Preserve metabolic rate after weight loss.⁸³
- Increase satiety and improve appetite control.^{84,85}
- Improve carbohydrate metabolism and glycemic regulation.^{86–89}

In addition, there’s evidence that protein intake may be particularly effective against belly fat. For instance, in a study published in *The American Journal of Clinical Nutrition*, researchers from Denmark assessed the diet and macronutrient intake on waist circumference among a large group (over 40,000) of people over the course of 5 years.

They found that, besides fruit and vegetable intake, only protein intake (specifically, animal protein) was inversely associated with belly fat.⁹⁰

In addition, a recent study published in the journal *Nutrition & Metabolism* demonstrated that the amount of quality protein consumed was inversely related to abdominal fat. In other words, people who ate more high-quality protein had less belly fat.⁹¹ And when it comes to quality protein (e.g., amino acid profile, digestibility), animal proteins (such as meat and eggs) are at the top of the list.

When buying meat and eggs, it's best to purchase products from pasture-raised animals whenever possible. In a recent systematic review and meta-analysis published in the *British Journal of Nutrition*, a group of researchers critically analyzed data from 67 different studies comparing the composition of organic (i.e., grass-fed, pasture-raised) and non-organic (i.e., conventional) meat products. They found that meat from pasture-raised animals contained 47% more omega-3 fatty acids than conventional meat products.⁹²

Further, several studies have examined the nutritional content of eggs from pasture-raised hens compared to eggs from commercial caged chickens. In a study conducted by researchers in Penn State's College of Agricultural Sciences, eggs from pasture-raised hens were shown to have 2 ½ times more omega-3 fats and less than half the ratio of omega-6 to omega-3 fats.⁹³

3. Pasture-Raised Dairy

Like meat and eggs, dairy (e.g., yogurt) is high-quality source of protein. Numerous studies have shown an inverse association between dairy intake and abdominal obesity. Even more interesting—and perhaps counterintuitive—is that recent research has shown that a high intake of dairy fat (e.g., full-fat milk and yogurt) is associated less belly fat.⁹⁴



Also like meat and eggs, it's best to choose products from organic, pasture-raised animals when possible. A recent systematic review found that organic milk was significantly higher than conventional milk in omega-3 fats, by an estimated 56%.⁹⁵ Even

more, organic milk contained an estimated 41% more conjugated linoleic acid (CLA).

CLA has been shown to improve body composition (i.e., reduce body fat, increase lean body mass), enhance immunity, and promote a healthy inflammatory response.⁹⁶ Even more, there is also some evidence that CLA may reduce visceral belly fat.^{97,98}

4. Whey Protein

When it comes to protein quality, whey (which is one of two major components of dairy protein) is often crowned king. Protein quality refers to the balance of amino acids, the digestibility of the protein to release amino acids for absorption, and the availability of the absorbed amino acids for protein synthesis.⁹⁹ Protein quality is also often defined as a protein's capacity to provide essential/indispensable amino acids, arguably the most important of which is leucine.¹⁰⁰



Traditionally, there have been several measures to assess protein quality, including Protein Efficiency Ratio, Biological Value, Protein Digestibility Corrected Amino Acid Score (PDCAAS), and most recently, the Digestible Indispensable Amino Acid Score, or DIAAS, which has been suggested to be “ostensibly superior” to the previously more commonly used PDCAAS.¹⁰¹

Regardless of which scale is used, animal-based proteins, such as milk (e.g., whey), eggs, and beef) rank at the top with the highest scores. For instance, DIAAS scores for whey, eggs, and beef are all above 100% whereas plant-based proteins typically fall below 80%. Whey is an ideal source of protein because it is rapidly-digesting, and it contains the highest concentration of leucine (13.6%).^{102,103}

Considering that whey protein is such a high-quality protein (remember, intake of quality protein has been shown to be inversely related to belly fat) and comes from dairy (remember, dairy intake seems to be inversely related to abdominal fat as well), it shouldn't come as much of surprise that whey may help ward off belly fat.

In a recent randomized, double-blind, placebo-controlled study published in the *Journal of the International Society of Sports Nutrition*, researchers from Finland assessed

the effects of whey protein supplementation on adaptations to resistance training over the course of 12 weeks in healthy men. The men consumed a whey protein shake (or placebo) immediately after exercise, which they performed 2 – 3 times per week. While both groups gained muscle size and strength, the group supplementing with whey protein lost significantly more total fat and belly fat at the end of the study.

In addition, whey has been shown to provide numerous other health benefits:

- Supporting muscle strength, size, and recovery
- Promoting appetite control
- Aiding in fat loss and weight management
- Promoting healthy aging
- Providing immune support
- Promoting glycemic control and carbohydrate management
- Supporting cardiovascular health

5. Coconut Oil

While once shunned because of its saturated fat content (more on that below), coconut oil is now lauded as a “miracle” food; some may even go so far as to call it a “cure” for [insert health concern here]. While it may not be the “magic bullet” that some would lead you to believe, there may be something to the “coconut craze.”¹⁰⁴ Combined with an overall healthy diet, there are a number of health benefits that may be conferred by regularly consuming virgin coconut oil.



Coconut oil is principally made up of saturated fat (about 92%), with as much as 70% of that being a special type of fat called medium chain fatty acids (MCFAs), or medium chain triglycerides (MCTs), making coconut oil unique among dietary fats. You see, unlike long chain fatty acids (LCFAs), which are the more common fats found in foods, MCTs are easily burned for energy and are far less likely to be stored as fat.¹⁰⁵

Furthermore, in the scientific community, MCTs are viewed as “functional” fats that provide a host of health benefits, as they have been shown to lower body weight, improve markers of metabolic health, reduce belly fat (i.e., visceral fat), and improve insulin sensitivity.¹⁰⁶ In other words, all fats are not created equally, and coconut oil is a very rich source of this unique, health-promoting saturated fat.

Research suggests that the MCTs found in coconut oil have a significant metabolism-boosting effect. In one study, researchers found that consuming MCTs increased metabolism more than eating LCFAs from other foods. As a matter of fact, the participants who consumed MCTs lost significantly more weight and burned more fat than the group consuming LCTs.¹⁰⁷

Researchers have also found that consuming just 1 – 2 tablespoons daily of MCTs can elevate the metabolism by as much as 5%, which may mean burning an additional 150 calories or more per day.¹⁰⁸ In addition to short-term feeding studies showing an acute rise in calorie burning with MCTs, research has shown that this elevation in metabolism continues even over prolonged periods of time.¹⁰⁹ What’s particularly interesting is that this increase in energy expenditure appears to be met by a subsequent increase in fat burning.

The MCTs in coconut oil may also suppress appetite, which may be related to their conversion in the liver to ketone bodies (more on that in a moment). In one crossover trial, researchers assessed whether increasing the amount of MCTs in the diet influenced food intake under free living conditions. They found that when men at the most MCTs, they consumed, on average, over 250 fewer calories per day.¹¹⁰

In a crossover trial published in *The American Journal of Clinical Nutrition*, researchers from France found that when they added MCTs to a standardized breakfast, men ate significantly fewer calories at lunch compared to when they ate the same breakfast with LCFAs.¹¹¹ Numerous other studies have shown that the addition of MCTs promotes satiety, resulting in an involuntary reduction in food intake.^{112,113}

With potential beneficial impacts on both aspects of the energy balance equation (i.e., more calories burned, fewer calories consumed), it may be little surprise that there’s evidence that coconut oil may promote weight loss.

In a randomized, double-blind, placebo-controlled clinical trial published in the journal *Lipids*, a group of Brazilian researchers found that women who consumed two tablespoons of coconut oil per day for 12 weeks while following a reduced-calorie diet and including daily exercise lost significantly more belly fat compared to the placebo group (i.e., diet and exercise alone).¹¹⁴ In another study, researchers from Malaysia found that men who added 2 tablespoons of coconut oil to their normal diets for 4 weeks significantly reduced belly fat.¹¹⁵

Furthermore, numerous randomized controlled trials have shown that supplementing the diet with MCTs (like those found in coconut oil) leads to greater weight loss and reductions in belly fat than other fats (e.g., LCFAs, including olive oil, soybean oil, canola oil, and corn oil), effects likely due to MCTs' ability to increase metabolic rate (i.e., calorie expenditure) and fat burning and suppress appetite.^{112,113,116–118}

6. Apple Cider Vinegar

According to a recent paper published in the *Journal of the Academy of Nutrition and Dietetics*, vinegar has been purported to be a weight-loss aid since the early 1800s. Research has shown that vinegar may promote weight loss by suppressing appetite, delaying gastric emptying, or exerting a “carb blocking” effect by inhibiting certain carbohydrate-digesting enzymes.¹¹⁹



Perhaps the most noteworthy benefits of apple cider vinegar relate to its effects on carbohydrate management. Recent research even suggests that an individual's glycemic response may be a key variable in determining the best diet for that person.¹²⁰ Even more, emerging evidence suggests that the better one's carb tolerance, the more carbs that s/he can eat while still losing fat.^{121–123} Research has also shown that poor insulin sensitivity, carbohydrate intolerance, and poor glycemic control can lead to weight gain, reduce energy levels, increase appetite, increase cravings, and more.^{124–126}

Vinegar has been shown to possess numerous benefits for insulin function and glycemic control. In one study, researchers from Arizona State University found that participants'

insulin sensitivity improved by as much as 34% when they consumed apple cider vinegar (about four teaspoons) before a carbohydrate-containing meal compared to when they ate the same meal without apple cider vinegar.¹²⁷

In a randomized crossover trial published in the *European Journal of Clinical Nutrition*, researchers found that consuming apple cider vinegar before eating white bread (providing 50 grams of carbohydrate) reduced participants' glycemic response by 31% compared to when the white bread was eaten without vinegar.¹²⁸

Numerous additional studies have fortified the ability of apple cider vinegar (as little as two teaspoons) to significantly improve insulin sensitivity and reduce the glycemic response when taken before a carbohydrate-containing meal.^{129–131}

In addition to its effects on carbohydrate management, apple cider vinegar has also been shown to reduce hunger, increase satiety, and ultimately, lead to reduced calorie intake at subsequent meals. In a randomized, crossover trial, researchers found that consuming apple cider vinegar before a carbohydrate-containing meal led to not only a substantial improvement in acute glycemic control, it also led to participants eating 250 fewer calories over the rest of the day.¹³²

In a separate study published in the *European Journal of Clinical Nutrition*, Swedish researchers found that consuming vinegar prior to a carbohydrate-containing meal led to significant increases in satiety (or feelings of fullness and satisfaction). The level of satiety was proportionate to the amount of vinegar consumed.¹³³

Naturally, with beneficial acute effects on carbohydrate management and satiety, apple cider vinegar has the potential to be a useful tool to promote weight management. In one randomized, double-blind, placebo-controlled trial, Japanese researchers found that participants who ingested apple cider vinegar daily for 12 weeks lost significantly more body weight, belly fat, and inches from their waistlines compared to the placebo group. Interestingly, folks who consumed two tablespoons of apple cider vinegar today showed greater improvements in these areas than those who took one tablespoon.¹³⁴

7. Green Tea

According to researchers, *Camellia sinensis*, which is the plant species whose leaves and buds are used in the production of tea, exerts several “anti-obesity effects.”¹³⁵ Although various types of teas (e.g., green, black) come from the *Camellia sinensis* plant, green tea leaves are processed (i.e., fermented) differently, which leaves them with a high concentration of beneficial polyphenols called catechins. It’s these compounds, which also have noteworthy anti-inflammatory and antioxidant properties, that seem to have quite a potent effect on the metabolism and fat burning; what’s more, they may also suppress appetite and decrease the absorption of calories.^{136,137}



Studies consistently show that green tea extract (standardized for the catechin epigallocatechin gallate, EGCG) increases the body’s use of fat for fuel, and these effects are independent of its caffeine content, which also stimulates metabolism and fat burning. EGCG does so by inhibiting enzymes that can shut down important fat-burning hormones (i.e., norepinephrine), thereby stoking the body’s fat-burning furnace.¹³⁸

In one study measuring 24-hour calorie expenditure and fat burning, healthy men supplementing with a green tea extract providing 90mg EGCG three times daily experienced a 4% increase in metabolic rate and 3.4% decrease in respiratory exchange ratio (RER), which signifies that they were burning more fat to meet the increased demand in calories.¹³⁹ The participants taking the green tea extract were even burning more fat during sleep, with over 41% of their daily calories burned came from fat—31% more fat burned than the placebo group.

In another study, participants taking a green tea extract (standardized for 400mg EGCG) daily for 4 weeks showed a 25% increase in fat burning, and what’s more, they lost over 1.5% body fat during the one-month trial.¹⁴⁰ In a 12-week study, participants taking a green tea extract (providing 270mg of EGCG daily) experienced a 3.3% increase in metabolic rate, a 4.6% decrease in body weight, and a 4.5% reduction in waist circumference.¹⁴¹

In yet another study, participants taking a green tea extract standardized for EGCG combined with a modest reduced-calorie diet lost over twice as much weight as the placebo group after just 8 weeks. The participants taking the green tea extract also experienced a 2-fold greater increase in metabolic rate compared to the placebo group.¹⁴² In other words, green tea can help make a good fat loss program even more effective.

In a randomized controlled trial published in *The American Journal of Clinical Nutrition*, Japanese researchers assessed the effects of green tea catechins (EGCG) on visceral fat. Healthy Japanese men consuming one bottle of EGCG-enriched tea daily for 12 weeks lost more weight, body fat, and subcutaneous fat than a control group. Even more, the men drinking the green tea extract lost over 4 times more visceral belly fat.¹⁴³

In addition to increasing metabolism, calorie expenditure, and fat burning, researchers also suggest that green tea extract can help control energy balance by suppressing appetite. In rats, researchers from the University of Chicago found that injections of EGCG significantly reduced food intake and body weight.¹⁴⁴ In a human study published in the *International Journal of Obesity*, participants consumed 8% fewer calories at a meal 4 hours after taking a standardized green tea extract when compared to the placebo group.¹⁴⁵ Not only did the folks taking the green tea extract eat less, they also experienced a significant increase in metabolic rate, an effect that was maintained over the course of the 8-week trial and was accompanied by a significant reduction in body fat.

Researchers suggest consumption of 2 – 4 cups (i.e., 500mL – 1L) of green tea per day to reap these fat-burning and health promoting benefits.¹⁴⁶

8. Bananas & Potatoes

Bananas and potatoes? Certainly this has to be a typo, right? After all, these are “white” foods that are “loaded” with carbs...they have belly fat written all over them. Au contraire, mon frère; not so fast.

Bananas (particularly green, unripe bananas) and potatoes (that have been cooked then cooled) are good sources of resistant starch, which is so-named



because it is a non-digestible carbohydrate (i.e., fiber). Resistant starch has been shown to increase satiety (feelings of fullness and satisfaction) and reduce food intake both acutely and in the long-term.^{147,148} Research has also shown that consumption of resistant starch increases fat burning, decreases fat storage, and improves insulin sensitivity.^{149,150}

That's not all; researchers speculate that resistant starch may also increase the thermic effect of feeding (i.e., increases calorie expenditure), and it may also promote weight loss and preserve calorie-burning muscle.¹⁵¹ Not surprisingly, the resistant starch has been hyped by the popular press as a “weight loss wonder food.”

Additionally, in a review study published in the journal *Critical Reviews in Food Science and Nutrition*, University of Colorado professor Dr. Janine Higgins critically analyzed the body of scientific evidence surrounding resistant starch and its effects on body weight and body composition. Dr. Higgins found that resistance starch can significantly reduce visceral belly fat stores. In fact, Dr. Higgins stated that “there is strong evidence demonstrating that RS [resistant starch] lowers whole body and visceral adiposity. The magnitude of these changes in adiposity are very large...”¹⁵¹

While resistant starch is not digestible by us, it is considered a “prebiotic” fiber that serves as “food” for our beneficial gut bacteria (e.g., probiotics). In other words, gut bacteria feed off resistant starch through the process of fermentation, which results in the production of key chemicals (i.e., short-chain fatty acids) that fuel our immune cells and stimulate the release of key hunger-suppressing hormones.

Several other health benefits have been associated with resistant starch in the GI tract, including enhanced laxation, increased uptake of minerals such as calcium, and reduced symptoms of diarrhea. As a prebiotic, resistant starch has been shown to positively influence the gut bacterial ecosystem, increasing levels of beneficial *Bifidobacteria* and reducing levels of pathogenic bacteria.

When resistant starches are fermented by healthy gut bacteria, a by-product is the production of short-chain fatty acids (SFCA), which may help suppress appetite. Specifically, SFCA stimulate the release of two key satiety hormones, GLP-1 and PYY.^{152,153}

As alluded to above, the content of resistant starch in food is highly influenced by

preparation and processing techniques. Generally speaking, the following are good sources of resistant starch:

- Green, unripe bananas
- Uncooked, rolled oats
- Potatoes that have been cooked then cooled
- Rice that has been cooked then cooled
- White beans that been cooked then cooled
- Lentils that have been cooked then cooled

Speaking of beans and lentils...

9. Beans & Lentils

In addition to supplying resistant starch, beans and lentils are among the best dietary sources of soluble fiber, which has been linked to lower levels of belly fat.



In a recent study published in the journal *Obesity*, researchers at Wake Forest University School of Medicine set out to examine what lifestyle factors were associated with changes in abdominal fat over the course of a 5-year study period.¹⁵⁴ The researchers obtained abdominal computed tomography (CT) scans at baseline and at 5 years from over 1,000 participants aged 18 – 81 years old. The researchers tracked physical activity levels and dietary intake throughout the study period.

Of all the factors they analyzed, they found that soluble fiber intake and participation in vigorous activity were inversely associated with visceral belly fat. In fact, for each 10-gram-per-day increase in soluble fiber, the amount of belly fat decreased by a substantial 3.7%. “Our study is valuable because it provides specific information on how dietary fiber, especially soluble fiber, may affect weight accumulation through abdominal fat deposits,” said lead author Kristen Hairston, MD, assistant professor of internal medicine at Wake Forest University School of Medicine.

Interestingly, previous research from this group demonstrated that visceral belly fat steadily increases over time, particularly in younger participants.¹⁵⁵ Results from this

study, however, reveal that increased consumption of soluble fiber led to a decreased rate of belly fat accumulation, suggesting that increased soluble fiber intake may be instrumental in slowing this natural progression. According to Dr. Hairston, a 10-gram daily increase in soluble fiber can be accomplished by eating two small apples, one cup of green peas, and one half-cup of pinto beans.

Legumes, such as beans and lentils, are also a good source of the mineral magnesium, which regulates cortisol and calms the nervous system. Research has shown that supplementation with magnesium can reduce cortisol levels when study participants are faced with a stressful challenge.¹⁵⁶ Supplementation with magnesium also led to reductions in sleeping cortisol levels and significant increases in slow-wave sleep, which contributed to normalize age-related changes in sleep patterns in older study participants.¹⁵⁷

In addition to beans and lentils (and other legumes, such as peas), other good sources of soluble fiber include:

- Oats
- Citrus fruits
- Carrots
- Barley
- Nuts
- Flaxseeds
- Berries
- Apples (with skin)

10. Veggies, Fruits & Nuts

As mentioned previously, research has shown that fruit and vegetable intake is inversely associated with waist circumference and abdominal obesity.⁹⁰ In a recent systematic review of 17 cohort studies (including over 500,000 participants), German researchers found that intake of fruit was inversely associated with waist circumference, and the highest fruit and vegetable intakes were associated with the lowest risk of excess body fat.¹⁵⁸



We know this doesn't really come as much of a surprise considering that veggies and fruits provide dietary fiber, including some soluble fiber, and they are low in energy density and glycemic load. Speaking of which, in a study published in the journal *PLoS One*, researchers from Europe set out to assess the association between dietary factors and visceral belly fat. Not surprisingly, they found that consuming a diet with low glycemic load and energy density may prevent visceral belly fat.¹⁵⁹

In addition to these noteworthy associations, various fruits and vegetables contain phytochemicals that may specifically help fight visceral belly fat.¹⁶⁰ For instance, sulforaphane, which can be found in cruciferous vegetables (most notably, broccoli), has been shown in several studies to have an “anti-obesity” effect. For instance, animal studies have shown that sulforaphane can mitigate fat gain—including accumulation of visceral belly fat—in animals overfed a high-fat diet.^{161,162} Another example is berries, which contain anthocyanins, the phytochemicals that give the fruit their rich, dark colors. Anthocyanins have also been shown to possess anti-obesity effects.¹⁶³

Like legumes, dark green leafy vegetables (e.g., spinach, kale, collard greens, turnip greens, etc.) are rich in magnesium. In addition to helping regulate cortisol levels, research has shown that magnesium deficiency induces anxiety and initiates the body's stress response (e.g., increase in the production of stress hormones); conversely supplementation with magnesium has been shown to reduce anxiety-related behaviors.¹⁶⁴

Likewise, nuts (e.g., cashews, almonds) and seeds (e.g., pumpkin, sesame, sunflower) are good sources of magnesium. In addition, nuts and seeds also tend to be good sources of the mineral zinc. Research has shown that lower zinc intakes appear to be associated with anxiety and depressed mood, and supplementation with zinc leads to significant improvements in anxiety and mood.¹⁶⁵

Another stress-easing property of nuts and seeds is their crunchiness. Interestingly, chewing (i.e., mastication) is an effective behavior for coping with stress. Researchers believe that chewing causes changes in the hypothalamic-pituitary-adrenal axis (HPA axis), which is responsible for initiating the hormonal response to stress. Under stressful circumstances, mastication attenuates stress-induced increases in stress hormones (e.g., cortisol, catecholamines).¹⁶⁶

Despite their energy density, studies have consistently shown that nut consumption is inversely associated with visceral belly fat. For instance, a cross-sectional study of over 7,000 men and women (as part of the PREDIMED study) demonstrated that higher nut consumption was associated with a lower risk of abdominal obesity.¹⁶⁷ In another cross-sectional study (the Adventist Health Study), researchers found that “tree nuts have a strong inverse association with obesity.”¹⁶⁸

More recently, in a study published in the *Nutrition Journal*, researchers analyzed data from over 14,000 participants over the course of five years to determine the association between tree nut (i.e., almonds, Brazil nuts, cashews, hazelnuts, macadamias, pecans, pine nuts, pistachios, and walnuts) consumption and adiposity. They found that tree nut consumption was associated with lower body weight and waist circumference, a marker of visceral belly fat.¹⁶⁹

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