

# OPTIMAL FAT LOSS

Mention the word “fat” and the thought usually goes to a person’s physique and the amount they possess on their body. In modern society’s parlance, it makes sense given the connotation of fat with one’s appearance or health status. However, it is critical to understand the obsession with “fat” relative to 1) its different types, 2) its benefits for optimal health, 3) making healthy dietary choices and amounts consumed, and 4) how to remove it from the body if one seeks healthy weight loss.

## Types of Fat

- Dietary fat.

- The “fat” you eat is one of the three macronutrients the body requires to survive and function properly (along with carbohydrates and protein). It has a caloric content of ~9 calories/gram (vs. carbs and protein at ~4/gram) when used as an energy source.
- Dietary fat can be classified as saturated, unsaturated, or trans. Note that specific foods may contain a combination of the three types, so they may not be 100% one or the other:
  - \* Saturated – The purported “healthy” fat, solid at room temperature, and found in animal products.
  - \* Unsaturated – The purported “unhealthy” fat, liquid at room temperature, and found mainly in plant products. Two types:
    - Monounsaturated – Oils, nuts, and seeds.
    - Polyunsaturated – Fish/seafood, vegetables, and seeds, with fish/seafood containing Omega-3 fat has proven health benefits.
  - \* Trans-fat – The worst type of fat manufactured by heating vegetable oils in the process of hydrogenation.

- Adipose fat.

- The fat one stores within the body:
  - \* Subcutaneous (beneath the skin). The “pinchable” fat.
  - \* Intramuscular (in muscle tissue). A more accessible form of energy when needed.
  - \* Visceral (around organs). High levels are not healthy.

- Types:

- \* White adipose tissue (WAT). WAT has fewer mitochondria (hence, less blood supply making it look whiter) and is used more for energy.
- \* Brown adipose tissue (BAT). BAT has more mitochondria (hence, more blood supply, giving it a darker color) and is stored in the neck and upper back areas. BAT can be used as energy immediately, without needing to go through the energy-producing process called beta-oxidation. Infants have a lot of BAT because they cannot shiver, and shivering can result in burning fat in adults.
- \* Beige adipose tissue. Beige adipose tissue is a combination of WAT and BAT, as it possesses some mitochondria. Note that cold temperature exposure can convert beige adipose tissue to BAT.

## Why We Need Fat

Believe it or not, the human body only requires two macronutrients to survive: fat and protein. Carbohydrates (CHO) – although they mainly supply glucose for energy - are not an absolute need because the body can manufacture glucose and ketones from the catabolism of fat and protein in their place.

- Brain Function Some fats like omega-3 fatty acids (FAs) are needed for optimal brain development and function to support cognition and memory.
- Bone Health – It plays a role in calcium absorption to promote strong and healthy bones.
- Cell Membrane Structure – Required to build components of cell membranes to maintain their integrity and facilitate the transport of nutrients.
- Energy Source - Provides energy at nearly two times the amount of CHO and protein.
- Essential Fatty Acids - The body cannot produce specific essential FAs (aforementioned omega-3 and omega-6), so they must be obtained through one's diet. Those FAs are required to support heart health, immune function, and overall well-being.
- Hormone Production – A building block for some hormones, including the appetite and body weight regulator leptin.
- Immune Function - Involved in immune cell function and inflammation regulation.
- Insulation and Body Protection - Insulates the body by regulating temperature and protects (cushions) internal organs from injury.

- Nutrient Absorption - Helps the body absorb fat-soluble vitamins A, D, E, and K from the diet.

## Why We Get Fat

- The truth is, anything eaten and digested must go somewhere. If it is not used by the body to perform an important function or used as energy, it will be stored for future energy as adipose fat. And because adipose fat sites do not have a "we are full, stop eating" connection to the brain, fat storage is unlimited.
- In today's society, we are inundated with food 24-7-365: media advertisements, the Internet, fast food stores, grocery store aisle temptations, and non-food department stores checkout aisles, convenience food marts, vending machines, quick food delivery services, and so many affordable, low-nutrition-value options everywhere. As a result, we over-consume and move less.
- A surplus of calories, independent of the type of macronutrient consumed, can lead to their conversion to stored fat. Therefore, calories in versus calories out are still necessary even though much focus recently has been on only how each macronutrient is processed relative to its potential calorie storage.
- Processed Foods The increased number of processed foods has altered how they are metabolized, leading to greater fat accumulation.
- Sugar addiction. Eating sweets increases the hormone dopamine response, increasing the craving for more. Also, we have neurons in the gut that signal the brain to keep eating even though the gut is satiated. The result is calorie hoarding.
- Food manufacturers know that the sugar/dopamine relationship leads to addiction; therefore, they leverage it to make a profit. Their addictive, low-nutrient food gets consumed more often and allows them to live in mansions and drive high-end cars.

## The Best Way to Burn Body Fat

- Note that any food consumed is "not in the body" until it is digested and absorbed. That is the basis for some with eating disorders to binge eat, followed by purging. No calories enter = zero chance of adding body fat. However, that is unhealthy due to the lack of good nutrients not being consumed.

- Fat burning is a 2-point issue: Mobilization and oxidation.
  - 1. Mobilization involves moving fat (stored as triglycerides [TGs]) out of fat cells via the process of lipolysis. The nervous system also plays a role in mobilization by releasing epinephrine from neurons connected to fat cells. The TGs are broken down into three FAs and one glycerol molecule. The three FA molecules are then available to be oxidized (burned).
  - 2. Oxidation involves a lengthy process that produces ATP energy via  $\beta$ -oxidation, the Krebs cycle, and the electron transport chain (ETC). That process provides a significant amount of energy compared to the catabolism of CHO.
- Creating a calorie deficit is still relevant: Consuming fewer calories than burned will force the body to tap into fat stores, all other factors being equal.
  - A calorie deficit can be created by simply eating fewer total calories and/or creating a demand for more energy via moving more/exercising regularly.
  - How many calories should one consume? There are plenty of online calculators to use, and most are based on one's height, weight, and estimated daily activity levels. Other factors to consider are one's current body fat-to-muscle mass ratio, sex, and age. Are they accurate? Likely not, but they do offer a starting point if you're counting total calories.
  - It is best to experiment with a calorie deficit and go from there. If that results in fat loss, stay with it. If not, keep decreasing the calories. Exercise regularly, eat well, and stay hydrated. and ignore the food cravings that occur when it's NOT time to eat.
- Exercise:
  - There is a difference between fat burning vs. fat loss, so it's important to note that fat burning during exercise doesn't always equate to overall fat loss. Exercise/moving is still an essential component of rational fat loss because 1) it adds to the calorie demand, and 2) It offers overall health benefits.
  - Do not think you can out-exercise a poor diet because most exercise does not burn many calories during its performance. However, exercise does help, and specific exercise modes can leverage greater fat usage, especially during post-exercise recovery.
  - The key to using exercise for fat loss is prioritizing fat burning by decreasing muscle glycogen stores. Doing so prompts the body to burn stored fat to fuel all body functions while replenishing depleted glycogen.

- The most prudent means to deplete glycogen during exercise to facilitate fat loss post-exercise is a high-effort, short-term activity. Scheduling low-effort, lengthy exercise like conventional "cardio" (e.g., an hour plodding away on an electronic device) is better than doing nothing. Still, most people do not have enough free time to commit to it.
  - \* High-intensity strength training (HIST) and high-intensity interval training (HIIT) are more time-efficient options for fat loss. Moderate intensity continuous training (MICT) can be used, but it is less time-efficient.
  - \* HIST: Use six to 30 reps in multiple bouts with long rests. This is ideal for depleting muscle glycogen and some liver glycogen.
  - \* HIIT: Perform at 80-100% Vo2 Max in multiple 1:00 to 3:00 bouts with moderate recovery time between each. Faster and shorter sprint-type workouts can also be performed using all-out sprints at 100% Vo2 Max for :08 to :30 with a 4:1 work-rest ratio (e.g., sprint for :15, rest for 1:00 to :15).
  - \* MICT: Perform in a steady state manner at 40-60% Vo2 Max or 55-75% maximum heart rate (MHR) from 40:00 to 60:00. That, of course, is more time-consuming, but it can be effective if you have time.
- Considerations:
  - \* Exercising with :08 to 1:00 high-effort bouts and short rest periods (4:1) up to 60:00 will result in greater fat burning near the end of the session. Doing the same type of sessions with more extended rest periods between bouts will allow an earlier switchover from CHO to burn fat in the 60:00 period.
  - \* In a lengthier 90:00 MICT session with food intake one to three hours pre-workout, less fat will be burned compared to CHO. If fasted one to three hours pre-workout, more fat will be burned near the end of the 90:00 compared to CHO.
  - \* Bottom line: the harder you work, the deeper the hole you dig for recovery. That deep hole must then be "filled in" (glycogen replacement, repair of compromised tissues, ATP energy restored). That requires proper food intake, so if your diet is sound, that is, healthy food and calorie deficit, your body will use stored fat to keep it running until all that recovery is completed, which may take a few days. Hard work also cannot be performed for extended periods; therefore, exercise sessions of that nature must be brief. Brief exercise then means more time for other essential matters. It is schedule-friendly, especially for those who are

constantly on the go.

- Non-exercise activity thermogenesis (NEAT):
  - Incorporating subtle movements throughout the day can increase calorie burn. Examples are fidgeting, knee bouncing, arm movements, head bobbing, pacing, and several bouts of standing up/sitting down throughout the day. Anything helps, and a day replete with non-scheduled NEAT is an inexpensive addition.
- Cold therapy:
  - Activating the shivering response through cold exposure to burn BAT and convert beige adipose tissue to BAT has been proven effective. Shivering releases succinate to make that conversion of beige to BAT adipose fat.
  - Creating a thermogenic environment for shivering can be done in several ways:
    - \* Use an uncomfortable water temperature between 50 to 70° Fahrenheit.
    - \* Submerging the body up to the neck is best, 2nd is a cold shower, and 3rd best is being outside in cold temperatures.
    - \* Get in the cold for 1:00 – 2:00, then out without drying for 2:00 – 3:00.
    - \* Accumulate 11:00/week between one and five sessions.
    - \* A contrasting method can be used with sauna heat for 15:00 alternating with the 1:00 – 2:00 cold bouts.
    - \* Shivering is the key because of the succinate release benefits.
- Fasting/Time-restricted eating (TRE):
  - What and when you eat sets the conditions for the body to function, both good and bad. For example, eating too often and too much alters proper hormone function and can facilitate fat storage.
  - Research has shown that fasting/TRE can better regulate hormone function and lead to better fat burning and other health benefits.
  - Several TRE plans can be used, provided the fasting periods are long enough to allow for their benefits. One example is consuming your first meal one hour after waking and then using an 8-10-hour eating window:
    - \* Wake at 7:00 AM.

- \* First meal at 8:00 AM.
- \* Healthy eating between 8:00 AM and 5:00 PM. That would allow fasting benefits to occur in a 15-hour window, including sleep, where many other health benefits take place.
- Prioritize sleep:
  - Improved sleep helps regulate metabolism, reduce hunger, improve insulin sensitivity, and enhance calorie burning.
  - Sleep deprivation creates numerous body dysfunctions and can hinder fat loss efforts.
- Other diet and supplement tips for optimal fat loss:
  - Essential Fatty Acids (EFAs): Consume 1,000 mg of EFAs per day.
  - Glutamine/L-Glutamine: Supplement with 500 mg to 3 grams per day.
  - Selenium: Ensure adequate selenium intake (55-400 mcg/day) for proper thyroid function.
  - Improve gut health: Improve your gut microbiome with fermented foods (sauerkraut, kimchi, kefir, yogurt), fruits, and vegetables.
  - Consider: caffeine (100 to 400 mg pre-workout) and Yerba Mate to potentially increase epinephrine and augment fat mobilization.
  - Consider: Guayusa tea to lower blood sugar and its antioxidant benefits.
  - Acetyl L-Carnitine may increase mitochondrial fat burning.
  - Limit processed and added sugar foods: they alter metabolism, encourage over-eating, and provide minimal nutrient value. By suppressing sugar cravings and retraining the gut to crave healthy fat (EFAs) and protein (amino acids/AAs), fewer daily feedings (fasting), and greater satiety (EFAs and AAs take longer to digest), and fewer total empty calories (less added sugar) will facilitate sensible fat loss.