

Energy.

introduction

Your body is always expending energy. It doesn't matter whether you are sleeping, performing a push-up, sitting at your desk, walking the dog or eating popcorn. Somehow your body must muster enough energy, through one process or another, to sustain life and perform the activities of daily living.

Some energy requiring processes are automatic. Your heart must beat. Your eyes must twitch. Your lung muscles must contract and relax. Your liver must process organic compounds. Your kidneys must filter your blood. While you have no direct control over these processes, there are dietary and lifestyle modifications you can make that affect how much energy your body "automatically" burns.

There are also voluntary energy requiring processes. You must fire the muscles in your legs to sit down in your desk chair, to move your fingers to clip the leash on the dog and to contract your gripping muscles to grab a handful of popcorn. Each of these actions requires energy.

All this energy is measured in tiny units called calories. Metabolism is defined as the caloric sum of all these chemical processes, whether automatic or voluntary, that must take place in order for the energy forming process to occur.

Metabolism.

Technically, metabolism is divided into four components: resting metabolic rate (RMR), thermal effect of feeding (TEF), thermal effect of activity (TEA) and adaptive thermogenesis (AT).

Your resting metabolic rate (RMR) accounts for the largest portion of your metabolism, up to 75% of your total daily energy expenditure. RMR includes all the automatic processes your body must sustain in order to live: the action of your digestive, cardiovascular and hormonal systems, the maintenance of proper body temperature, the preservation of sensitive electrical gradients in your cells and the conductance of electrical transmissions through your nervous system.

Without your RMR you would cease to exist. However, in the presence of certain crucial factors outlined in this book, your RMR can be slightly enhanced in a way that not only maintains normal function but pushes the rate just slightly higher!

The TEF is the caloric sum of all the energetic processes required to digest, absorb, transport, metabolize and store your food. Believe it or not this can account for up to 10% of your energy expenditure. Portions of this book explain how the content and chemical structure of the foods you eat can increase or decrease the TEF.

The TEA is the easiest metabolic component to modify and accounts for up to 30% of the total daily energy expenditure depending on your level of physical activity.

If you're physically active you've already taken a step in the right direction toward increasing your TEA.

The 100 tips presented in this book will move you light years forward by supplying you with the knowledge of exactly which activities to perform, for how long and with what intensity to drive your TEA through the roof.

The final component of metabolism, the AT, is your body's "reaction" system. Basically, your metabolism will make sensitive rate alterations in response to changes in the external or internal environment, such as physical or mental stress, hot or cold temperatures and changes in the body's hormone levels. There are certain strategies outlined in this book that throw environmental "curveballs" at the AT, forcing the body to react and maintain a highly sensitive metabolism.

It is also possible to have an energy surplus. The Law of Conservation of Energy says that energy cannot be created or destroyed, it can only change form. Therefore, unused energetic compounds found in food are either extracted as waste products or stored for future use, usually as fat.

To avoid this unwanted energy storage, the metabolic strategy outlined in this book is three-fold:

1. Practice dietary techniques that eliminate the energy surplus.
2. Follow lifestyle guidelines that maximize energy expenditure.
3. Supplement with compounds that have been proven to optimize the body's ability to use energy.

Food.

Energy comes from food. However, complex actions must take place inside your body for turkey, mashed potatoes and cranberries to become the energy needed to talk, stand, sit, walk and breathe. Your body must break the food into small pieces, then absorb and move them through the membrane of a tiny cell to be broken into even smaller pieces. These pieces then enter into a miniscule cellular component called the mitochondria. The mitochondria is the cell's powerhouse. It is here that the electrical power of oxygen is harnessed to finally break that last tiny molecule of food apart and release energy!

There are thousands of crucial steps leading up to this eventual release of energy, most of which require energy themselves. This energy is derived from the calories, nutrients, vitamins and minerals you've previously consumed and are combined with the oxygen you breathe. Any shortage of the necessary components results in a shortage of energy. Therefore, inadequate oxygen or inadequate food intake results in inadequate energy.

Inadequate energy results in a slow metabolism. This book not only tells you how to ensure adequate nutrients from your dietary and supplement intake, but also how to achieve adequate oxygen balance in your internal and external environments.

Barriers.

In the energy creation process, there are certain barriers to overcome. Take free radicals, for example. The more energy you require the more oxygen you must utilize. Occasionally oxygen can mutate and escape from the cell in the form of a “free radical” or oxidant. When these renegade oxygen molecules combine with other molecules in the body they can interrupt the processes associated with their “host” molecule.

Because they can interact with so many different molecules, free radicals can wreak serious havoc by altering DNA, destroying sensitive protective barriers around the cell and changing the fragile biochemical structures of proteins and fats. These disruptions and alterations of sensitive cellular processes can sabotage energy production. Even a small amount of damage to a cell’s outside receptors and membrane can severely alter the movement of compounds in and out of the cell, eventually killing the cell.

Another serious barrier to boosting your metabolism is blood sugar stabilization. After consumption of a carbohydrate-rich meal, your digestive system breaks down the carbs into tiny glucose molecules.

Once these molecules enter the bloodstream they trigger the release of insulin by an organ called the pancreas. Insulin ensures that the glucose is delivered to necessary tissues for energy. When these energy stores are full any excess glucose still in the bloodstream or digestive tract is easily converted to fat.

Unfortunately, most of us are walking around with chronically elevated insulin levels because of excess energy consumption, especially in the form of simple sugars. Constant exposure to high amounts of insulin results in a condition called “Metabolic Syndrome.”

This condition is characterized by high levels of circulating fats in the bloodstream, high cholesterol, high blood pressure, uncontrollable appetite cravings, obesity and increased diabetes risk. Even more critical is the decreased sensitivity to insulin which means that the cells become so accustomed to high blood insulin levels that they grow non-responsive so even more insulin is released!

You’ll find many strategies in this book directly focused on improving your sensitivity to insulin and stabilizing your blood sugar levels, thus avoiding this metabolic roller coaster ride. You’ll also discover how dietary supplements assist in overcoming the blood sugar stabilization barrier. For example, chromium, vanadyl sulfate and manganese are all compounds that assist insulin.

By lowering the need for insulin release and enhancing blood sugar stabilization they decrease the body’s propensity to store carbohydrate as a fat. While it may be difficult to consume these compounds in their raw form, there are dietary supplements that contains a perfect balance of all three! This book is full of such simple dietary tips and supplement recommendations.

The Solution.

You're holding in your hands the key to unlocking your energy levels and making your metabolism burn like a wildfire! If you follow 10 of the tips in this book you'll double your energy levels. If you follow 20 tips you'll see fat literally melt from your waistline. If you follow 50 tips you'll wonder why you avoided this incredible effect for so many years.

But if you read this book cover-to-cover and integrate each of the 100 tips into your daily lifestyle while using a combination of the unique and entirely natural dietary supplements I suggest, you'll find your entire quality of life peaking at levels you never thought imaginable. Enjoy the feeling.

**Train smart, eat smart, live smart,
Ben Greenfield NSCA-CPT, CSCS, MS, C-ISSN**

P.S. I've also scattered several "Metabotips" throughout this book. These tips, tricks and secrets are amazing weight loss tools! Also, to discover more information about many of the exciting dietary supplements featured in this book, contact the person who gave you this book, or visit www.impaxworld.com.

*Individual results of recommended supplements may vary. The author makes no therapeutic claims on any products. Information contained in this book should not be used as a substitute for personal medical attention, diagnosis or hands-on treatment.



The author

Other books by Ben Greenfield, available at pacificfit.net:

Shape21: The 21 Day Lean Body Manual

The E-Health Handbook of Diet & Fitness Secrets

Top 12 Resistance Training Routines for Triathletes

Run With No Pain

Ben Greenfield resides in Spokane, WA, where he is Director of Sports Performance at Champions Sports Medicine and President of Pacific Elite Fitness. He graduated from University of Idaho with bachelor's and master's degrees in sports science and exercise physiology, and is certified as a personal trainer and fitness coach by the National Strength & Conditioning Association, and a sports nutritionist by the International Society of Sports Nutrition. Ben's services are available for diet and nutrition counseling, exercise prescription, corporate fitness programs, and lifestyle wellness programs, via in-person, online, and phone consultations, and he offers a free blog and podcast at www.bengreenfieldfitness.com. His specialties include metabolic influences on weight loss, and science based training of endurance athletes. To learn more, visit www.pacificfit.net or e-mail Ben at elite@pacificfit.net.

To discover more information about many of the exciting dietary supplements featured in this book, contact the person who gave you this book, or visit www.bengreenfield.impaxworld.com.

1

metabotip

Put candies, chocolates, and other sweet or high-calorie snacks in non-transparent containers. Your brain is triggered by what the eyes see, and by “hiding” unhealthy snacks, you’ll grab fewer handfuls. Keep the good stuff, like fruits and vegetables, in a transparent, centrally located bowl.



Choose Cardio Wisely.

Not all cardio machines are created equal. To maximize calories burned during exercise and elevate your post-exercise metabolic rate, you'll want to choose your cardio machines wisely. The key is to rank them in order of their "double-whammy" effect. Determine what machine burns the most calories while you're on it while increasing your metabolic rate for the longest period of time.

I've ranked some for you in order of their effective burn rate:

- 1) Running on a treadmill with slight incline
- 2) Rowing or swimming
- 3) Upright bicycle with hills
- 4) Elliptical with arms and legs
- 5) Elliptical with legs only
- 6) Recumbent bicycle with hills
- 7) Walking on a treadmill.

Although this will vary from person to person depending on weight, it's a rough estimate of how to get the most bang for your buck. So what are you waiting for? Go find yourself a treadmill, a rowing machine or a pool. Just be sure to mix it up enough so that your body doesn't get used to any single mode of exercise.



Power Up.

Did you know that an Olympic power lifter burns as many calories in a typical day of training as an Olympic marathoner? That's because explosive fast-twitch muscle motions burn a lot of energy and use a high amount of carbohydrates. While lifting or performing body-weight exercises at high velocities does have an inherent risk factor, there is a large amount of energy required, a huge post-exercise metabolic rate increase and an anabolic hormone response that vastly improves fat burning capabilities.

If you learn how to properly do exercises like the power clean, lunge jump, push press and jump squat, they can become your most potent calorie-burning and metabolism-boosting weapons. Make certain that the coach or personal trainer who instructs you is properly certified! Although these exercises are complex, with correct power-lifting form, you'll stay free from injury and reap huge waistline benefits.



Crucial Copper.

Minerals initiate, regulate and control vital bodily functions like enzyme activity, digestion, cell electrical impulse and metabolism. The mineral copper reduces free radical damage and enhances recovery from exercise, helps maintain bone and connective tissue health, and preserves normal thyroid gland function. Copper also helps develop the proteins and enzymes essential to iron utilization which directly influences the amount of oxygen available to working tissues. This is important since every molecule of oxygen you utilize burns a significant number of calories!

So what are the top sources of copper? Try crimini mushrooms in your omelet, turnip greens with your spinach salad and blackstrap molasses in your oatmeal. Don't have time for a copper-based meal? Green barley grass, a powerful antioxidant and rich source of chlorophyll, magnesium, protein, and trace minerals like copper can be found in the powerful superfood supplement EnerPrime. Another powerful supplement called ProstElan contains a perfectly balance of zinc and copper citrate.



Twitch.

Studies have found that individuals who are constantly moving burn more calories. This seems obvious but many people don't realize that "constantly moving" includes activities like tapping your feet, drumming your fingers, standing up, sitting down, moving your head in circles, shrugging your shoulders, clenching your butt and even rolling your eyes! These movements may seem to incorporate only small and insignificant muscle contractions but every time a muscle fiber moves it uses energy and increases your body's temperature and metabolism.

It's true that larger muscle fibers burn more calories but when you're attempting to elevate the metabolism, even the tiny boosts from smaller muscle fibers will help. If you're trying to lose or maintain weight or just keep your metabolism elevated, make sure that you're twitching and fidgeting as much as possible. Employing even these small movements while you're riding on the bus, watching television or even eating breakfast will make a big difference in your metabolism.



Never Go Hungry.

Perhaps you've heard that eating small and frequent meals is a very effective way to keep the metabolic fire burning. However, this strategy only works if you never actually become hungry. Hunger pangs which are caused by low blood sugar, tell your digestive system that there's a food shortage and to slow down to conserve energy. This is accomplished by decreasing the rate of your body's normal functions effectively putting the brakes on your metabolism. Sometimes this can even happen before you actually experience hunger pangs.

One low blood sugar level indicator is sudden mood or attitude swings which often occur before experiencing hunger. Here's an interesting note: high performance endurance athletes will sometimes eat as soon as they start having bad feelings about the race. They have found they can't accurately rely on feelings of hunger as a sign of low blood sugar. A quick calorie intake can quickly bring blood sugar levels back up and simultaneously give attitude a positive boost! So don't let yourself get to the grumpy, hungry point in your daily routine.

The best strategy is to always have a meal hidden away in your bag, purse, locker, desk, office refrigerator or glove box. Nuts and berries, fresh raw fruit and low-fat yogurt are great places to start. You can further stabilize your energy levels and limit the hunger associated with a hypoglycemic drop by using the supplement ThermoFactor, a formula that stabilizes appetite and blood sugar.



Test Your RMR.

RMR stands for “Resting Metabolic Rate” or the number of resting calories you burn during a day. Since your RMR accounts for about 75% of your total daily energy expenditure, if you know your RMR you can instantly determine how many calories you need to eat in a day in order to lose or maintain a healthy weight. You can also find out how much of what you burn is carbohydrate versus fat which is important in determining what your daily percentages of these nutrients should be. RMR measurements completely take the guesswork out of establishing how many calories, carbohydrates, fat and protein you should consume a day to maximize your metabolism. The best part is that this particular metabolic test is simple. Just a brief 10-15 minute assessment is done while you sit quietly and breathe into a tube or mask. A RMR test will cost anywhere from \$50 to \$200 depending on the testing location. RMR testing is crucial for an individual who wants to lose fat or gain muscle, any athlete who is attempting to achieve a higher power/weight ratio or someone who is curious as to whether they have a “high or low” metabolism.

Does your RMR ever change? Absolutely! Changes in exercise, diet and supplementation can all increase or decrease RMR. One perfect way to gain more “free” calorie burning is by consuming a combination of the metabolism-boosting supplement called LeanFactor and the energy-stabilizing supplement called ThermoFactor.



Over-Eat.

If you are at a constant net caloric deficit, which is typical in most diets, then your body will have negative energy stores. You can only function for just so long in this state before your body begins to “shut down” by depressing the metabolism and lowering performance during exercise and the activities of daily living. Without adequate nutrition, your hormones, enzymes and other important metabolic contributors fall to levels too low to maintain the desired metabolic rate.

To address this problem and make sure you don’t go for an extended period of time at a caloric deficit, occasionally consume a large meal. This will not only keep your body from the 24-7 stress levels that are associated with underfeeding but will also give you a mental break from your regular dietary restrictions. Give yourself this break every week or two by just eating more than usual. You can still eat healthy by visiting an “all-you-can-eat” salad bar or healthy buffet. You may choose to make yourself a fancy multi-course dinner at home. The best time for this large meal is immediately after exercise when the food is most likely to end up in your muscles for energy.

8

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When consuming high-calorie drinks, foods and snacks, leave the mess on the table as you eat. Bones from chicken wings, shells from shrimp and empty wine bottles will cause you to eat less because you'll be more aware of the amount already consumed.