

Body Transformation Part II: Nutrition.

What to eat, when to eat, and how much of what to eat when you eat.

By

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“I can eat all the Twinkies, ice-cream, and donuts I want, as long as I am working out enough to burn them off.” OUCH. I cannot speak for others, but for a long period of time I was under this same assumption. Or how about “I have been working out the way I should (cardio and weights), but have not noticed any weight loss or change in my body composition.” The body will just “balance” itself out, and I won’t gain any fat weight as long as my cardiovascular and weight training activities are sufficient. Well the sad news is that this is very untrue. The human body does not keep score. Your body is made up of everything you eat. Every cell in your body is made of what you have eaten. ***The effectiveness of any body -transformation training program relies on the nutritional strategies and one’s commitment to those strategies. If one is not committed to both, then actual body composition transformation should not be the goal, as the potential for success is quite limited.***

Rocket Science, Brain Surgery, or..... Common Sense?

Let’s make this simple, as there is too much confusing, contradictory, and complex information being disseminated. The three most important factors of nutrition are when you eat, what you eat, and how much of what you eat when you eat. It is that simple. Different foods, at different times, in different amounts, have different effects on your hormonal responses to the food. The different hormonal responses determine how the food will be stored and how it is utilized. It is that simple. Yet we cannot break free of the foods that sabotage our results. These foods exist in our comfort zone. In essence, why do we wait until certain times of the year to change our dietary habits? For the very same

reason many of us do not want to stand in front of large audiences and talk about the “Potent and Specific Genetic Interference by Double-stranded RNA in *Caenorhabditis Elegans*” (this was UMass Med School Professor Dr. Craig Mello’s Nobel Prize speech). Simply, because it is uncomfortable. We have become accustomed to what we are comfortable with, and we do not want to leave this comfort zone.

Adrenal Burnout

Poor dietary habits. Too much or too little exercise. Stress at home or on the job. Lack of quality sleep. Exposure to toxic chemicals, stimulants, alcohol, food additives, over the counter and prescription medications. These factors are taken from Dr. Diane Schwarzbein’s excellent book, *The Schwarzbein Principle II*. (If you have not read the book *The Schwarzbein Principle I* or *II*, I highly recommend these books. Dr. Schwarzbein is one of the foremost experts on the topic of adrenal burnout and how to heal it). According to Dr. Schwarzbein, “Hormones control regeneration in the body; when your hormones are not balanced, your body’s ability to regenerate is compromised. Regeneration involves using up and then rebuilding the same structural, functional and energy biochemical’s that are used again and again (19).”

With a healthy metabolism, there is an equal balance between usage and regeneration. An unhealthy metabolism, which leads to “accelerated metabolic aging (19)”, is characterized by an imbalance between usage and regeneration. “In other words, you rebuild your functional, structural, and storage biochemicals at a faster rate than you can use them, or you use up more than you can rebuild. So you can be overweight or thin and have an inferior metabolism (19)”.

Each of the above factors has a direct effect on your body’s hormonal response to stress, nutrient intake and usage, and daily activity. The 3 major hormones that need to be in balance are cortisol, adrenaline, and insulin. Each of these is “crucial for maintaining immediate life-sustaining functions, such as regulating your heartbeat and blood pressure and also maintaining the pH balance of your blood. So if you are missing any one of these major hormones, you will get sick quickly and not live for very long. Since these hormones keep you alive and also determine how you feel daily, their importance to your health and well-being is obvious (19)”.

Let's take a closer look at each of these hormones.

Insulin

What it does:

- “Keeps your body from using up too many of your biochemicals (19)”
- “Helps to rebuild all your functional biochemicals such as enzymes, hormones, and neurotransmitters (19)”
- “Helps to rebuild your structural biochemicals such as cells, muscles, and bones (19)”
- “Helps to rebuild energy biochemicals, fats, and glycogen (19)”
- Insulin is released proportionately to the amount of in-coming sugar. The insulin “unlocks” the receptor sites of the liver cells, so the sugar can be broken down to generate ATP (Adenosine Tri-Phosphate), stored as glycogen, or converted into triglycerides or cholesterol.

Health Issues

- “If insulin did not communicate to your liver and other body cells that excess sugar is around and needs to be processed or taken up into the cells, the ensuing high blood-sugar levels would cause a lot of tissue damage through oxidation. This is the process that forms free radicals in your body (19)”.
- Insulin Resistance: After years of producing fats and sugar from eating excess carbs, your body begins to fill its cells with energy it cannot use. Therefore, your cells do not respond quickly to the insulin response of food, and store it as fat rather than using it as energy.
- There are many health problems associated with insulin resistance including Type II diabetes, cancers, high blood pressure, abnormal cholesterol ratios, and plaque build ups in the arteries and brain.

Adrenaline

What it does:

- “Helps your body access it’s biochemicals so that you can use them to think, move and do all activities of daily living(19)”
- “Allows you to break down and use your food for energy (19)”
- “Signals the breakdown of old cells to make room for new ones, keeping your cells younger and functioning better (19).”

Health Issues

- “If your adrenaline levels are higher than they should be all day because of poor nutrition and lifestyle habits (over exercise), you will continuously secrete and use up your functional and energy biochemicals, which then gives you a sense of well-being. This feeling can be addictive. You will also increase the turnover of your structural biochemicals, which will keep you looking younger in the short term. By continuously secreting, using up and breaking down your biochemicals through the action of chronic high adrenaline levels, you will end up “broken”. This means you will look older and develop health problems, including degenerative diseases of aging that will compromise the quality of life (19).”
- “When you feel poorly from low adrenaline levels, you usually self-medicate with caffeine (aspirin or coffee/soda), which is one of the chemicals that helps whatever adrenaline you have at the moment become more potent (19).”

Symptoms of High Adrenaline Levels	Symptoms of Low Adrenaline Levels
<ul style="list-style-type: none">• Anxiety• Blurred Vision• Burning Feet• Excessive Sweating• Heartburn• Heart Palpitations• Interrupted Sleep• Light Headedness/Dizziness	<ul style="list-style-type: none">• Allergies• Asthma Attack• Flu-like Symptoms• Increased Susceptibility to infections• Insomnia• Mental Exhaustion• Short term Fatigue

Cortisol

What it does:

- “Keeps your blood pressure from going too low (19)”
- “Helps the liver to store glycogen and increase new sugar production (19)”
- “Responsible for mobilizing energy for your brain (19)”
- “Blocks the uptake of sugar into your muscle cells, which keeps more sugar in your bloodstream to make it more available for brain fuel (19)”
- “Minimizes cellular damage by reducing the body’s inflammatory response to bacteria, viruses, and other foreign proteins (19)”

Health Issues

- “With self-induced stresses caused by poor nutrition and lifestyle choices, cortisol levels will rise, causing the body to use up your biochemicals and shutdown non-essential bodily functions (19)”
- **“Symptoms of Over-secretion of cortisol include:**
 - Weakened Immune Function
 - Infertility
 - Decrease in Bone and Muscle Mass
 - Loss of Hair
 - Thinning of Skin
 - Inability to Grow Nails
 - Decrease in Concentration and Memory

- **“Symptoms of Under-secretion of cortisol include:**
 - Protein Deficiency State
 - Type II Diabetes
 - Redistribution of body fat from arms and legs to midsection
 - High Blood Pressure
 - Weakened Immune System
 - Burned out Adrenal Glands

So how does this all tie in with our daily nutrition? “Food is the material that your body uses to regenerate itself; all your structural, functional and energy biochemicals are made from food nutrients. Your hormones regulate all the chemical reactions that your body undergoes to regenerate. Because the systems of the body are all interconnected and hormones direct all chemical reactions, every function of your body is tied into the changing of food into hormones, which then regulates the changing of other food into the different biochemicals (19)”.

This has been a brief overview of what happens to your body when your nutritional strategies and lifestyle habits are not optimal. For more in-depth information on the topic of hormones and adrenal burnout, once again, I highly recommend reading Dr. Diane Schwarzbein’s book, *The Schwarzbein Principle II*, as it contains corrective nutritional and lifestyle changes.

When to Eat

According to Ivy and Portman (2004), “During a muscle’s 24 hour growth cycle, there are periods when the muscle is actively involved in producing energy, periods when it is recovering, and periods when it is growing. For the metabolic machinery of the muscle to function at its best during each of these periods, the appropriate amounts and types of nutrients must be consumed at the appropriate times (11).”

The body will more readily absorb, convert, and utilize certain macronutrients at different times of the growth cycle (day). For instance, studies have shown the time frame within 1 hour after an intensive workout is optimal for carbohydrate and protein ingestion, as these macronutrients are readily

absorbed, converted, and utilized, rather than being stored as excess fat (See Post Workout Recovery Nutrition article on www.apec-s.com).

To lose body fat and truly change body composition, the timing of ingestion of these macronutrients has to be tailored to meet the goals. Earlier in the day, ingestion of proteins and moderate carbohydrates is an effective strategy. The carbohydrates early in the day will provide a fuel source for the body's activities throughout the day. At different times of the day our hormonal profile changes. Our tolerance for glucose decreases throughout the day, whereas our tolerance for free fatty acids increases throughout the day. Therefore, it is effective to consume complex carbohydrates in the morning, early afternoon, and post workout. This will prevent the catabolic (breakdown of muscle proteins) effects typically seen in low carbohydrate/high fat diets. The body will use (breakdown) muscle tissue via gluconeogenesis as a last source of energy because it has no glycogen to be utilized as energy.

As the day progresses, the ingestion of carbohydrates decreases while the ingestion of healthy fats increases, except for the post workout meal. The post workout meal should have the highest amount of carbohydrates and lowest amount of fats, as this is the period of time for which the body will readily absorb and utilize these macronutrients. Fat consumption is the opposite, with effective metabolism of fats increasing throughout the day. Therefore, ingesting healthy fats from mid afternoon to evening, and not within 2 hours post workout can be an effective strategy for minimizing body fat accumulation. "FFA increases over the course of a day can themselves have a relationship with poorer carbohydrate metabolism. Clearly then, breakfast — and a "second breakfast" consisting of low-fat, higher carbohydrate feedings are important. It's at this time of day that FFA (Free Fatty Acid) concentrations are lower and our muscle's ability to take up blood glucose is best (14)."

In order to optimize nutrient timing, the strategy of carbohydrate cycling was created. "Carb cycling is based on having three different carbohydrate intake levels during the week: high(er) carbs, moderate carbs, and low(er) carbs. Ideally these days are split according to your training schedule. This dietary approach is based on not consuming too many carbs and fats *together* and on consuming carbs mainly during periods of increased insulin sensitivity (in the morning and post-workout). Carb cycling is based on having three different carbohydrate intake levels during the week: high(er) carbs, moderate carbs, and low(er) carbs. Ideally these days are split according to your training schedule (24)."

“Carb intake is kept lower and is ingested around training time, which also allows a higher carb intake to fill our glycogen stores. This entire process continually keeps our insulin levels relatively sensitive and creates a more favorable environment for our nutrients to be stored where we'd like them to be. Our metabolism will be through the roof and we'll be dropping body fat. The better we can store nutrients, the leaner our body composition will be. To best achieve this, we need to frequently alternate our carbohydrate intake to maintain a high level of insulin sensitivity (21).”

The benefits to AM ingestion of carbohydrates/protein and PM ingestion of proteins and fat are numerous. “This approach provides adequate carbs for glycogen replenishment, which is good for fat loss as well as performance — less fatigue, better biochemistry, nitrogen sparing and even immune/stress response suppression. It also provides fats that in sufficient quantities can keep up Testosterone concentrations, maintain lipolytic ("fat burning") pools and pathways, and further enhance immune modulation. And let’s not forget that overall dietary *variety* is both healthy and compliance-facilitating (14)”

A sample carb cycling protocol based on a workout schedule might look like the following

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Priority Workout	Active Recovery.	Priority Workout	Cardio	Workout	Rest	Cardio
High Carb Day	Low Carb Day	High Carb Day	Moderate Carb	Moderate Carb	Low Carb	Moderate
<200 grams	<100 grams	<200 grams	<150 grams	<125 gram	<100 grams	<150 g

Breakdown of High, Moderate, and Low Carb Days:

Meal	High Carb Day	Moderate Carb Day	Low Carb Day
Breakfast	Protein/35-50g CHO	Protein/25-40g CHO	Protein.15-25g
AM Snack	Protein/15-25g CHO	Protein/10-20g CHO	Protein/10-15g
During Workout	Protein/Amino Acid	Protein/Amino Acid	Protein/Amino
Post Workout	Protein/30-50g CHO	Protein/25-40g CHO	Protein/20-35g
Lunch	Protein/60-75g CHO	Protein/40-50g CHO	Protein/25-30g
Mid PM Snack	Protein/Healthy Fat	Protein/Healthy Fat	Protein/HF

Dinner	Protein/Healthy Fat	Protein/Healthy Fat	Protein/HF
Pre Bedtime	Protein/Healthy Fat	Protein/Healthy Fat	Protein/HF

What to Eat/What not to Eat

Did you know that the TV show Mythbusters did a study comparing the nutritional values of cereal and the cardboard box the cereal comes in? They measured the caloric content of 1 gram of cereal at 9 calories and the caloric content of 1 gram of cardboard box at 20% less than the cereal. They then performed a test on the nutrients of each. The test showed what you might expect: the cereal had fat, starch, sugar, and protein, while the cardboard box had much less or none of all four, i.e. no real nutrients. However, cardboard can be considered a true negative calorie food (in other words you will burn more calories digesting it than when you eat it) It is filled with cellulose, which cannot be digested by humans, so one would not recommend eating it.

The point to this story. At times we are faced with food choices in which the contents of the package are not much better for your metabolic state (health) than the package they come in. Let's take a look at a common food snack such as chocolate chip cookies. (***The following is an excerpt from www.fitsugar.com**)

CHIPS AHOY CHIPS AHOY CHOCOLATE CHIP



Ingredients: ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMINE MONONITRATE [VITAMIN B1], RIBOFLAVIN [VITAMIN B2], FOLIC ACID), SEMISWEET CHOCOLATE CHIPS (SUGAR, CHOCOLATE, DEXTROSE, COCOA BUTTER, SOY LECITHIN - AN EMULSIFIER), SUGAR, PARTIALLY HYDROGENATED SOYBEAN OIL, HIGH FRUCTOSE CORN SYRUP, LEAVENING (BAKING SODA, AMMONIUM PHOSPHATE), SALT, WHEY (FROM MILK), NATURAL AND ARTIFICIAL FLAVOR, CARAMEL COLOR.

Nutrition Facts

Serving Size 40g
Servings per Container about 1

Amount Per Serving

Calories 190 Calories from Fat 80

% Daily Value*

Total Fat 9g **14 %**

Saturated Fat 2.5g **13 %**

Cholesterol 0mg **0 %**

Sodium 140mg **6 %**

Total Carbohydrate 27g **9 %**

Dietary Fiber 1g **4 %**

Sugars 13g

Protein 2g

1. **Hydrogenated oil:** It's made through a process that turns free-flowing oil into a lard-like solid at room temperature. The food industry uses it because it's inexpensive and increases shelf life of products, so companies can increase their profits. Eating this trans fat increases the bad cholesterol (LDL) in your body and is bad for your heart.
2. **Enriched flour:** All the grain's nutrients are destroyed in the refining process. Companies add a little bit of the lost nutrients back and label it "enriched" so it seems nutritious. Fewer nutrients mean you'll be feeling hungry soon after, so choose foods made with whole grains instead.
3. **High-fructose corn syrup:** Your body processes this differently than good old-fashioned cane sugar. It contains more fructose than sugar and converts to fat more easily, which can cause weight gain.
4. **Refined sugar:** When you put sugar into your system, you experience a sugar high that rapidly raises your blood-sugar levels. You get a sugar high, then energy crash. Sugar that is naturally combined with fat or fiber sources, like in fresh fruits, will absorb into your body much slower, helping you avoid the roller-coaster sugar ride.
5. **Saturated Fats:** These are found mostly in animal products such as butter, cream, hot dogs, beef, and skin from chicken. They increase your cholesterol levels and clog your precious arteries, which causes cardiovascular disease. (Fitsugar.com)

The above is probably not the best food choice. This would fall under the "what not to eat" category if your goal is to decrease your body fat and change your body composition.

If it wasn't alive or growing it cannot be considered a whole food. If it cannot be considered a whole

food and you choose to eat it on a weekly/daily basis, feel free to read the following excerpts from the Medical Testament: Nutrition, Soil Fertility, and the National Health, as you may change your mind.

Whole Foods vs. Processed/Refined Products

“Dr. Robert McCarrison, the brilliant English surgeon, took up the study of certain diseases common to the people of Asia. He was interested in finding out to what degree diseases in Indian peoples were caused by faulty food.

The only difference he could find was in their diet. The Hunzas practiced a Spartan form of agriculture, returning all organic matter to the soil. Their food consisted chiefly of raw fruits and vegetables, sprouted pulses, whole grains, nuts milk products from goats, and occasionally a small portion of meat, usually during holidays and weddings. Since chickens have a natural urge to peck at seeds, and since seeds are more valuable than money in Hunza, until recently no chickens were allowed in the state.

The Hunzas grow apples, pears, peaches, apricots, black and red cherries, mulberries; and the stones of the fresh apricot are cracked open and kernels also eaten. They eat their vegetables mostly raw. They grow spinach; lettuce, carrots, peas, turnips, squash, young leaves and various herbs, and they sprout pulses and eat them. Whole grains: wheat, barley, buckwheat, and small grains. Of cereal foods they eat wheat and a great deal of millet. By stone grinding the whole grain remains in the flour and as a result is very nourishing. Nuts: the Persian Walnut, almonds, pecans, hazelnut, apricot kernel. These are an excellent source of high grade proteins and fats. Very little fat of any kind is consumed by the people through ghee, butter apricot oil and negligible quantities of animal fats. Apricot kernel oil is the most important source of fat. Milk products: fresh milk, un-boiled, unpasteurized and buttermilk, clarified butter (ghee) cottage cheese, yoghurt and sour milk. Meat does not form an important part of the Hunzan way of life. Most foods are consumed raw. Complete absence of foreign additives. Nothing whatsoever is added to either the soil or the food of the people or the animals. No sprays or spray materials of any kind are used on their crops, and no unnatural chemical fertilizers are used on their lands. All fruits and vegetables that are dried for storing have been exposed to the sun and air. No foreign substances are added or treatments used.

Dr. McCarrison noted that the neighboring villages to the State of Hunza were addicted to white man's foods. To test his theory that foods made the difference, Dr. McCarrison began his historic feeding experiments in 1927.

He built up a stock of healthy, disease-free rats. Then he divided the rats into groups and fed each group a different diet. Some groups were fed the whole, unprocessed foods of the healthy northern races of India, while others were fed the refined, processed foods of the unhealthy races of southern India. All the rats were kept in identical conditions – only their diets varied. Before long it became apparent that the rats fed the whole, unprocessed foods thrived, while the health of the others deteriorated.

In later experiments, Dr. McCarrison gave a set of rats the diet of the poorer classes of England; white bread, margarine, sweetened tea, boiled vegetables, tinned meats and inexpensive jams and jellies. On this diet, not only did the rats develop all kinds of diseased conditions, but they became nervous wrecks: "They were nervous and apt to bite their attendants; they lived unhappily together, and by the sixtieth day of the experiment they began to kill and eat the weaker ones amongst them.

During the course of his experiments on some 2243 rats fed on faulty Indian diets, he found and listed diseases of every organ of the body. The diseases that made their appearance, McCarrison noted, were diseases of the eye, ear, nose, throat, lungs, and stomach together with skin disease, heart disease and, in fact, diseases of every organ of the body were observed. The rats' endocrine systems degenerated, they didn't reproduce well, and they became prone to miscarriages, premature births and still births.

But not only did the food of the unhealthiest races of India affect the physical health of the rats, it also altered their temperaments. Rats that had once lived peaceably together now became bad tempered and began to squabble and fight. Though once they had been amenable to being handled; now they literally bit the hand that fed them.

Dr. McCarrison wrote, "All these conditions, these conditions of ill health had a common causation: faulty nutrition with or without infection. I found that when; growing rats of healthy stock were fed on diets similar to those of people whose physique was good, the physique and health of the rats were good; when they were fed on diets similar to those

of people whose physique was bad, the physique and the health of the rats were bad; and when they were fed on diets similar to those of people whose physique were middling, the physique and health of the rats were middling (4)."

Food choices are a matter of well ...choice. This article was not created to tell you what to eat; it is to be used as an educational tool on how certain foods/products affect your hormonal profile, which in turn regulates your metabolism. The choice is yours.

HOW MUCH TO EAT WHEN YOU EAT

Portion Control

Recently there was an interesting educational T.V. program on the eating habits of thin people. Slower eating habits, putting the fork down between bites, and enjoying their food. An interesting experiment they performed consisted of eating while blindfolded. The day before the experiment, the subjects ordered whatever they wanted for breakfast at a diner. They all finished or nearly finished their plates. The next day they went back and ordered the exact same breakfasts (same time, same portion size, etc...) with the only difference being they were required to eat while blindfolded. Not a single subject finished their meal. They all ate until they were full, but none were able to finish their meals.

This study showed that eating until you are full and eating until you clear your plate are two different things. Portion control is one of the most effective methods of weight control and body composition alteration. Just look at the weight loss programs that exist in our modern society. Many of them are based on portion control.

Helpful Hints:

- Eat whole foods when you can
- Try to avoid refined/processed products
- Eat multiple meals throughout the day. (3 regular meals and 3 snack meals is preferred).
- Eat breakfast. (Make sure to have some sort of protein/complex carb for breakfast)

- Minimize ingestion of high GI (Glycemic Index) carbs.
- Fish oil supplementation has been shown to have many positive effects including anti-inflammation, decreasing body fat, and positive effects on hormonal profile.
- Eat as many fibrous vegetables as you want. Try to eat veggies with each of your regular meals.
- Incorporate Para-workout liquid recovery meals.
- Carb/Protein/Veggies first 3 meals, Protein/Healthy Fats/Veggies last 3 meals.
- Highest carb meal of the day should be within 1-2 hours post workout.
- Carb cycling according to your workout/rest day schedule
- Drink plenty of fluids (preferably water)
- Heal your adrenal system. Read The Schwarzbain Principle I or II (Hint: minimize intake of toxic chemicals, get proper amounts of sleep, minimize cardiovascular training, partake in proper weight training methods, and correct errors in nutrition)
- Some helpful supplements when dealing with adrenal fatigue include antioxidants, multi-vitamin, glutamine, and branched chain amino acids.
- Portion control. (The size of your fist can be an adequate portion for lean proteins and low GI carbs.)
- Stay away from low/no fat foods as they have greater amounts of processed sugars. Don't forget, the body needs healthy fats to maintain optimal functioning.
- Don't be fooled by food labels! Changing the portion size allows food manufacturers to get away with labels that say not fat/carb. For instance, if a food has less than .5 grams of fat per serving it can be listed as no-fat. To do this, all they need to do is decrease the serving size so it is below the .5g threshold.

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