Benefits of weight training

- Increases lean muscle mass, which in turn boosts the body’s metabolic rate, which is one of the ways to a leaner body
- Increases bone mineral density, which can decrease osteoporosis
- Increases overall body strength, which can improve balance and reduce the chance on injury
- Improves overall mood and sense of well being
- Improves body image and self confidence
- Improves sleep and energy levels
- Improves many health issues such as, diabetes, hypertension (blood pressure), high cholesterol levels, etc

Benefits of Aerobic Exercise

Decreased Resting Heart Rate
With aerobic training the heart muscle becomes stronger and therefore does not have to work as hard to pump a given amount of blood.

Decreased Submaximal Heart Rate
With aerobic training the heart becomes stronger and therefore does not have to work as hard to pump blood at a given work load.

Increased Stroke Volume
Stroke volume is the amount of blood ejected by the heart in one heartbeat. Because the heart muscle has become stronger with aerobic training, it can eject more blood per heartbeat.

Increased Hemoglobin
Hemoglobin is the body’s oxygen-carrying component, located within red blood cells. The more hemoglobin available, the more oxygen-carrying capacity the body has. Aerobic training results in an increased amount of hemoglobin, so a person can continue aerobic exercise for a longer period of time.
**Increased Capillary Number within Muscles**
An increased number of capillaries helps facilitate the exchange of oxygen and waste products in and out of the body’s muscle cells.

**Increased High Density Lipoproteins (HDL’s)**
HDLs can help carry damaging cholesterol away from the body’s arteries, returning it to the liver for resynthesis. Since aerobic training results in an increased number of HDLs in the body, the exerciser has less circulating cholesterol and subsequently less risk for cardiovascular disease.

**Decreased Blood Pressure**
A person’s blood pressure is a measure of how forcefully the blood flows through his or her arteries. This pressure is determined by a person’s heart rate (an increase in heart rate will increase blood pressure), stroke volume (an increase in the amount of blood ejected per beat will increase blood pressure), and the arteries’ resistance to blood flow (if blood must pass through a narrower vessel, the blood pressure increases). Aerobic training can reduce a person’s heart rate, increase stroke volume, and reduce the arteries’ resistance to blood flow. The overall effect is a reduction in blood pressure.

**More on cardio:** The best times to do cardio (from a fat loss standpoint, not a performance standpoint) is on an empty stomach, first thing in the morning - perhaps with a little protein consumed, water, and caffeine to give you a boost. (The protein intake may help prevent losing any muscle tissue that could be burned up for fuel during the cardio session - assuming you’re training hard and long enough). The reason empty stomach cardio (first thing in the morning) works so well is because if glycogen levels (stored carbs) are low, which they are after sleeping, your body will have to tap into its fat reserves for energy sooner. BUT, if you are training for performance (an upcoming race for example) then you should be consuming carbs before your cardio session.

The second best time to do cardio from a fat loss standpoint is immediately AFTER you do your weights, never before (if doing weights and cardio during the same exercise session).
For three good reasons:

- Weights require much greater mental focus and a “fresh nervous system” to properly execute a complex movement. Where during cardio you can more easily space out.
- If you do your cardio first, you will be burning up some glycogen (stored carbohydrates). And since your body can pretty much only use glycogen for fuel during weights, if you did cardio first, and therefore enter your weight training session already somewhat depleted, the workout would not be very efficient.
Similar to above, if you do your weights first, and burn up much of your glycogen stores, you will have less carbs available for your cardio, and therefore have to burn more fat!

Different phases of effects on the body from training

Referring to the alarm phase, the adaptation phase, and the exhaust phase (overtraining or stale phase)

Alarm Phase
During the alarm phase the body says, “What the heck is this!?” This occurs when you begin a new training program. During this phase:

- Soreness is usually the greatest
- Movements and exercises can be awkward
- Tolerance to that “burning sensation” in your muscles is low

Adaptation Phase
During the adaptation phase, the body begins to recognize the repeated stress that it is being subjected to from your exercise program. At this time:

- Your body becomes stronger and more efficient.
- Movements become smoother
- Soreness decreases
- Lactate threshold increases (increased tolerance to that “burning sensation”).

Exhaust Phase
There are two reasons why the body may enter an exhaust phase. First, the body may become so familiar with the stress that it no longer needs to improve. This occurs when your program has grown stale, therefore halting your progress. Secondly, the body may not be receiving enough time to recover and/or adapt. This is when overtraining can set in.
**Symptoms of over-training** – to name a few

- Decreased performance (strength, power, muscle endurance, cardiovascular endurance)
- Decreased training tolerance and increased recovery requirements
- Chronic fatigue
- Sleep and eating disorders
- Menstrual disruptions
- Headaches, gastrointestinal distress
- Chronic muscle soreness and damage
- Increased resting heart rate
- Decreased self-esteem
- Decreased ability to concentrate

If you feel any of these symptoms on a regular basis, take a week off before resuming your training. However, the best prevention is to avoid over-training all together.

Structure your program to have easy, medium, and hard workouts that rotate either daily, weekly, monthly, etc to constantly stay between the alarm phase and adaptation phase. This way you won’t get stale and you’ll avoid over-training.

An exercise program should have some consistency so your body can adapt, but have enough variety to keep it guessing a little bit. Then, completely change your program after 8-12 weeks, depending on goals, individualism, training background, etc.

**Definitions of muscle adaptations via resistance training**

**Muscular Endurance** - The ability of the muscle to perform repetitive contractions over a prolonged period of time.

**Muscle Strength** - The ability of the muscle to generate the maximum amount of force, usually in the form of one repetition.

**Muscle Hypertrophy** – Increase in muscle cell/fiber size (girth)
Muscle Hyperplasia – Increase in muscle cell/fiber number – can happen to certain animals, but has not been fully shown to take place in humans. However, fat cells can increase in number when current fat cells become full. Watch that diet!

Rep ranges & Rest Intervals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Repetitions</th>
<th>Rest Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength</td>
<td>1-6</td>
<td>3-5 min.</td>
</tr>
<tr>
<td>Hypertrophy</td>
<td>8-12</td>
<td>1-3 min.</td>
</tr>
<tr>
<td>Endurance</td>
<td>15+</td>
<td>&lt; 1 min.</td>
</tr>
</tbody>
</table>

This is a very general chart. Goals can be somewhat blended within different rep ranges. For example: One can still gain strength in a hypertrophy range, and one can still gain size (hypertrophy) in the lower end of endurance training, and so on.

No matter what range you are working in or the goal you have mind in, intensity is the key to success!

Training Myths

Myth #1: You can burn fat off a certain area of your body by doing specific exercises for that area. In other words, you can spot reduce.

False – The body loses body fat off different spots and different rates. You cannot do an exercise for a certain body part, and subsequently burn fat off that specific area.

Myth #2: Females will get big, freaky muscles if they lift too hard and or heavy.

False – Females do not have the hormone levels to get extremely large muscles. So unless they have superior genetics, years of training and diet experience, and take anabolic steroids, they will not get “unnatural” looking muscles. Like this:
Females **should** workout hard with intensity if they want to “tone up”, because the more muscle they have on their bodies, the lower the body fat. Remember, muscle is metabolically active. The more you have, the higher your metabolism will be.

**Myth #3:** When doing cardio, staying in the “fat burning zone” is best for losing body fat.

**False** – It *is* true that at a lower intensity - aka the fat burning zone - the body can use stored fat for energy (because oxygen is present). However, it is possible that not enough calories are burned in order to lose weight. Also, higher intensity cardio increases EPOC (exercise-post oxygen consumption), which means you’ll burn more fat after the cardio session. Now, not everyone is capable of doing high intensity cardio, so some individuals may need to start out easy. But just like weights, intensity always trumps easy workouts.
THE “FIT” PRINCIPLE

<table>
<thead>
<tr>
<th>F.I.T.</th>
<th>F = frequency</th>
<th>I = intensity</th>
<th>T = time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength Training</td>
<td>Minimum 2x a week is recommended</td>
<td>Refers to who much weight is being lifted</td>
<td>Variable</td>
</tr>
<tr>
<td>Cardio/Aerobic Training</td>
<td>Minimum 3x a week is recommended</td>
<td>Refers to using either Heart Rate % or a RPE scale</td>
<td>Duration of session - at least 20 minutes is recommended if not more</td>
</tr>
<tr>
<td>Flexibility Training</td>
<td>Minimum 2x a week is recommended</td>
<td>Hold each stretch for a minimum of 10 seconds. Should be semi – uncomfortable, but w/o pain</td>
<td>Variable</td>
</tr>
</tbody>
</table>

The “FIT” Principle describes the three factors included in any training program. “F” = “frequency,” “I” = “intensity,” and “T” = “time.” Cardiovascular exercise, muscular strength and endurance exercise, and flexibility exercise differ regarding their requirements for each of the “FIT” components.

**Frequency** Refers to the number of workout performances each week.

*Muscular Strength/Muscular Endurance (Strength Training)*
Muscular strength and muscular endurance exercise should be performed at least twice per week to continue improvements. Although, 3-4 sessions of a properly structured program will yield greater results.

*Cardiovascular/Aerobic Exercise*
Cardiovascular exercise should be performed at least three times per week in order to obtain optimal health benefits. Beyond five sessions per week, few health benefits can be obtained, while injury risk increases dramatically – Although this depends on many other factors: ones nutritional intake, sleep, training history/experience, supplementation, goals, and all three components of “FIT”.

**Flexibility**
Flexibility training should be performed at least twice per week.

**Intensity** Refers to how hard the work bout is.
Cardiovascular/Aerobic Exercise
Cardiovascular exercise intensity is monitored by heart rate. 60-85% of heart rate reserve is the approximate intensity range used in cardiovascular exercise. Some individuals cannot detect a heart rate when performing aerobic exercise, and/or may prefer to utilize an alternate way of gauging intensity. The Rate of Perceived Exertion (RPE) scale is a way of doing just that. During the work bout, the individual rates his/her exertion level based on a scale of 0 to 10, with 0 being no perceived work felt at all, 10 being very, very strong work perceived.

**RPE Revised Rating Scale**
0 Nothing at All
0.5 Very, Very Weak
1 Very Weak
2 Weak
3 Moderate
4 Somewhat Strong
5 Strong
6
7 Very Strong
8
9
10 Very, Very Strong
Maximal

**Intensity cont...**
*Muscular Strength/Muscular Endurance Intensity*
Intensity for muscular strength and endurance conditioning is **not** dependent on heart rate. Intensity refers to the resistance, or the amount of weight lifted. Lifting heavier weights--as in STRENGTH training--is higher intensity work.. Lifting lighter weights--as in MUSCULAR ENDURANCE training--is lower intensity work. (But should not mean low effort, or easy)

**Flexibility**
Intensity for flexibility is determined by how much a muscle is stretched. Flexibility exercises are performed until the individual feels a slight stretch or pulling sensation in the muscle. The stretch is then held for at least 6-10 seconds. The exercise should **NOT** cause pain. If pain is felt, the intensity is too high--the muscle is stretched too much.

**Time** Refers to the duration of the work bout, excluding warm-up and cool-down.

**Cardiorespiratory/Aerobic Exercise**
Aerobic exercise should be performed continuously for at least 20 minutes. Recent research seems to point to the conclusion that, in order to obtain health benefits, splitting up the activity sessions can be effective, as long as the moderate-intensity physical activity totals 30 minutes throughout the day, at least 10 minutes at a time. For optimal gains, however, 20 minutes at a time is usually the **minimal** standard. As an individual becomes more aerobically fit, the time of the bout can and should increase.
Muscular Strength/Muscular Endurance Exercise/Flexibility

Time is not necessarily a factor in any of these components. As long as the entire body and all its major muscle groups receive attention, a certain amount of time is not required. Individuals who include more lifts in their program may require an hour or more per workout, while others may only require 1/2 hour per workout. Similarly, individuals who hold their stretching exercises for 30-60 seconds each will require more time per workout than those who hold their stretches for 10 seconds.

WHAT CAN HIGH-INTENSITY INTERVAL TRAINING DO FOR YOU?

INTERVAL TRAINING generally refers to repeated sessions of relatively brief, intermittent exercise, in which short intervals of intense exercise are separated by longer periods of recovery. Depending on the level of exertion, a single effort may last from a few seconds to several minutes, with exercise intervals separated by up to a few minutes of rest or low-intensity exercise.

High-intensity interval training is often dismissed as being only for elite athletes. However, the basic concept of alternating high-intensity and low-intensity periods of exercise can be applied to almost any level of initial fitness. In addition, interval training is often based on subjective effort and does not necessitate working out at a specific heart rate or running speed. So while intervals may mean all-out running sprints for people with high levels of fitness, intervals can mean a brisk walk for others.

Benefits

· High-intensity intervals are a potent training stimulus. Even though the volume of exercise is quite small, a few brief sessions of intervals can cause adaptations similar to those associated with more prolonged periods of continuous moderate-intensity exercise.
· You only need to do intervals every other day, so you have more days off. This is great news for people who are pressed for time.
· Time flies. Not only will you be able to reduce your training time, but also the actual exercise component will zip by because of the alternating periods of intensity.

Limitations

· Discomfort. Intervals are very strenuous, and your legs will feel like jelly at the end of
the workout. While you don’t have to exercise at 100% intensity to see results, you will have to leave your “workout comfort zone” if you want to achieve the benefits of high intensity training.

· You will need to do an extended warm-up session if you plan on running sprints for your interval training sessions. Explosive running may increase your risk of injury compared to less weight-bearing activities such as cycling or swimming. If you run your intervals, try doing them up a hill.

The science behind interval training also helps to bury myths such as the “fat burning zone” and “it takes 30 minutes of exercise before your body begins to burn fat.” Skeptics often dismiss the fat loss potential of high-intensity exercise because the intervals are relatively short. But energy expenditure remains high during the recovery periods between exercise intervals, even though exercise intensity is dramatically reduced. To demonstrate this point, a recent study showed that only seven sessions of high-intensity interval training over two weeks increased fat burning during exercise by more than 30%.

**Sample Workouts**

Here’s a sample program for an absolute beginner (someone who can walk for 30 min at 3.5 mph):

· Warm up: Five minutes of walking at 3.5 mph.
· Speed up and walk at 4.0 mph for 60 seconds.
· Slow down and stroll at 3.0 mph for 75 seconds.
· Repeat steps 2 and 3 five more times.
· Finish with 5 minutes of walking at a comfortable pace to cool down.

Here’s an example of a more advanced workout for a person who is used to relatively vigorous exercise:

· Warm up: Five minutes of easy jogging or light cycling.
· Run or cycle for 60 seconds at about 80-90% of your all-out effort. (Assume 100% equals the speed you would run to save your life, or cycle with as high a cadence as possible at the highest possible workload setting).
· Slow down to 30% of your all-out effort for 75 seconds. (Make sure to reduce intensity to a slow pace.)
· Repeat steps 2 and 3 five more times.
· Finish with 5 minutes at 30% of your all-out effort to cool down.

As you become more experienced, you can increase the intensity of the exercise intervals. You can also use different modes of exercise to do intervals. If you like to train outdoors, you can perform hill sprints or run in waist-deep water. If you are resigned to training at a commercial gym, you can choose between the treadmill, cross-trainer, stationary bike, and even the rowing machine. It all comes down to having the ability to increase the workload for a short amount of time and then being able to back off.

**COMMENT**

It is unlikely that high-intensity interval training produces all of the benefits normally associated with traditional endurance training. The best approach to fitness is a varied strategy that incorporates strength, endurance and speed sessions as well as flexibility exercises and proper nutrition. But for people who are pressed for time, high-intensity intervals are an extremely efficient way to train. Even if you have the time, adding an interval session to your current program will likely provide new and different adaptations. The bottom line is that — provided you are able and willing (physically and mentally) to put up with the discomfort of high-intensity interval training — you can likely get away with a lower training volume and less total exercise time. And possibly burn more body fat!

**Stretching – different types**

**STATIC, BALLISTIC and DYNAMIC STRETCHING**

Flexibility, one of the health-related components of fitness, can be improved by incorporating stretching into one’s physical fitness program. Three modes of stretching used to increase flexibility include ballistic stretching, static stretching, and dynamic stretching.

**Ballistic Stretching** exercises are performed using rapid, bouncy movements which provide force to lengthen muscles. Although this particular type of stretching has been indicated to improve flexibility, it also can lead to injury due to tearing of muscle tissue. Similarly, ligaments (which connect one bone to another) can be overstretched, which can promote joint instability. Loose joints may further lead to sublaxation and dislocation. Plus, when a muscle is very
quickly stretched, it will often naturally tense up to avoid being over stretched. This can prevent obtaining a beneficial stretch.

**Dynamic Stretching** involves movement and motion while stretching a muscle or muscle group, without the bouncing associated with ballistic stretching. Dynamic stretching has been shown to be the most effective way to warm up prior to exercise. Because of the constant movement, blood flow increases and the core temperature of the muscle rises.

**Static Stretching** involves the slow, gradual lengthening of a muscle. Once a final position is reached, and the stretch is held for several seconds, the muscle will continue to relax allowing the individual to further the stretch. Because the stretch occurs slowly, the muscle can relax, resulting in greater length. This is the stretching technique practiced most frequently among fitness professionals, and poses very low injury risk. However, slow, static stretching is constantly done at the wrong time.

Static stretching is too often performed *before* exercising. Research shows that static stretching actually “dulls” the nervous system, shutting your muscles down – aka relaxing them. Muscle strength and contractile speed also decrease during static stretching. The best time to static stretch is *after* you workout; the muscle is warm, you are finished training, and can now “shut those muscles down”. Experiment with this: warm up with movement and motion (ex light jogging followed by dynamic stretching). You will notice a remarkable difference in how warmed up you feel. So don’t ruin it by static stretching next!

Static stretching is important, but is more effective from a flexibility, safety, and efficiency standpoint if it is done *after* your training session. If you feel a must to static stretch before you exercise, you must first warm the muscles up, and then warm them up *again* after you’re finished in order to have a safe and efficient exercise session. To optimize performance and minimize injury risk, all stretching should be performed when the body’s muscles are warm.
WATER:

FLUID MAINTENANCE

Rigorous exercise over an extended period of time will undoubtedly result in thirst. The majority of people, however, do not realize the body’s thirst “response” (the feeling of being thirsty) is inadequate to prompt needed fluid replacement, especially during exercise. Furthermore, a physically active individual will lose more fluids through perspiration than a sedentary individual, making proper hydration even more important. And on top of that, if you wait until you are thirsty, you’re all ready dehydrated! A muscle loses roughly 10% strength and 8% contractile speed when dehydrated - so don’t wait until you get thirsty!

What type of fluid is “best”? Should the fluid be cold or warm? How much should be consumed? What benefits do sport beverages provide?

The type of liquid replacement as well as its temperature can affect the rate of fluid absorption into the body. The body absorbs most of its fluids from the small intestine. Therefore, the faster one can get the fluid into the intestine, the faster it may be absorbed. Cold water is one of the best fluid replacements for the average exercising person, as it not only speeds gastric (stomach) emptying into the intestine, but also aids in core temperature reduction. Contrary to what many believe, cold water does not cause stomach cramping. The volume of water, however, can be a factor in gastric distress. Since many people find consuming large volumes of fluid at once can impair performance, smaller amounts (3-1/2 to 8 ounces) taken at frequent intervals during the workout or competition are recommended. This doesn’t mean one should only consume 8 oz of fluid during exercise, it just means sipping slowly may be more comfortable.

Sport beverages (Gatorade, PowerAde, etc) are heavily marketed to the public. They are promoted to supply electrolytes (potassium, sodium, chloride, magnesium) and calories lost through physical activity. An individual or athlete who participates in prolonged aerobic activity (over an hour in length) on a regular basis and/or who exercises in a high-temperature or high-humidity environment may need to consider electrolyte replenishment. Since many use physical activity as a means for weight management, consuming sport beverages negates caloric loss. Endurance athletes, however, may be concerned about carbohydrate replacement.
While most exercising individuals do not need sport beverages, those participating in regular, prolonged endurance exercise may need them. The presence of glucose (a simple form of carbohydrate), found in many current commercial products, can improve fluid absorption. Although such beverages may not empty from the stomach as quickly as cold water, they may be absorbed out of the intestine and into the body as rapidly as water. Beverages containing 6-8% glucose or sucrose can provide energy to working muscles, which water cannot do. Thus the use of such beverages in long distance runners, triathletes and other endurance performers, who require added energy in order to continue their prolonged activities, may be beneficial.

Fructose, another form of carbohydrate, is not absorbed as quickly as glucose, and is often associated with gastric distress. Subsequently, while beverages with carbohydrate in the form of glucose, glucose polymers and/or some sucrose are recommended as exercise fluid replacements, juices and other high-fructose beverages (like soda) are not.

Whatever form of fluid replacement you choose, remember to drink plenty of water throughout the day. Approximately 8-12 (64 to 96 oz) glasses of water is recommended.

**Nutrition**

**THE BODY’S FUELS**

There are three basic fuels, or “substrates” the body uses to produce energy. These substrates, or macronutrients, are found in varying amounts in all foods. Because an individual requires varying amounts of each substrate in the diet, monitoring what goes into the body is important.

**Carbohydrates:** Carbohydrates are the body’s main source of fuel, as they are easy to break down and readily available. Pretty much anything that grows from the ground is considered a carbohydrate. Sources of carbohydrates include rice, potatoes, oats, beans, corn, vegetables, fruits, breads, cereals and other grains, and pasta. Carbohydrates are broken down into different types of sugars, and then eventually converted to glucose. From here glucose is either used
immediately for energy; stored in either the muscle or the liver (referred to as glycogen) for later use; or converted to body fat.

There are four (4) calories per gram of carbohydrate. Thus, if a food item has 20 grams of carbohydrate, the food contains 80 calories of carbohydrate (20 grams x 4 calories per gram).

Carbohydrates can be classified as simple and complex. This deals with the length of the carbon chain and how long it takes the body to break down the specific type of carb.

*Simple carbohydrates* are broken down very quickly and used for energy right away, stored as glycogen for later use, or stored as body fat. For the most part you want to limit your simple sugar intake. Simple sugars include but aren’t limited to: processed food/junk food, juice, soda, crackers, chips, white bread/bagels, fruit, milk, sports drinks, etc.

The best time to consume simple carbohydrates would be directly after an intense weight training session. This will help replenish the energy lost during the training and help shuttle the protein into the muscles (which should be consumed at the same time) quicker, to start the repairing and replenishing process.

*Complex carbohydrates* are broken down much slower (in most cases) and provide a greater, prolonged release of energy. Complex carbs include oats, rice, potatoes, beans, corn, whole grains, most vegetables, pasta and bread (if whole grain/whole wheat), etc.

The glycemic index is a scale that was created for diabetics to help monitor blood sugar levels. It is based on 100 being the highest number, with table sugar (sucrose) and white bread (both simple sugars) being at the very top. The higher the number, the quicker insulin is released from the pancreas to help move this blood sugar (glucose) out of the blood stream. Insulin is a double edged sword- it will take blood sugar to exhausted muscles after a grueling workout, or it will take it body fat cells for storage. This is why simple sugars after a workout can be helpful because insulin will take the glucose (broken down carbs) to the hungry muscles. Similarly, if simple sugars are eaten when the muscles don’t need quick energy, insulin will take the glucose to be stored as fat.
People freak out with foods like rice and potatoes because (although complex) they have a relatively high glycemic number. The problem with the glycemic index is this: these numbers are only true if the carbohydrate food is eaten alone. When a “good, clean” carb like potatoes are eaten with a lean protein, a fibrous carb (veggie), and a healthy fat (olive oil), the glycemic number is thrown out the window. Plus, new evidence shows that rice and potatoes have a type of starch called resistant starch that is difficult for the body to break down. So go ahead and eat these foods, just combine them with a veggie and a lean protein.

I personally classify carbohydrates into starchy carbs (rice, potatoes, corn, oats, whole grains, beans, etc) and fibrous carbs (vegetables). I try to always combine a starchy carb with a fibrous carb (in addition to a lean protein) to slow down the release of insulin. In addition to this, I limit simple sugars almost all together except for after a workout or during a cheat meal 😊

Fiber helps reduce the speed at which carbohydrates are broken down, and therefore the rate at which insulin is released. Insulin helps shuttle glucose (broken-down carbs) to muscles for energy replenishment (in the morning, after a grueling workout, etc.), or to be stored as body fat (perhaps right before bed, etc). Because fiber helps glucose be released into the blood stream slower, and insulin spikes will be kept at bay, you’ll get less glucose stored as fat, and more utilized for energy. This is why you want to always eat a fibrous carb with a starchy carb. Not only are vegetables loaded with vitamins and minerals, they also supply fiber. Good sources of fibrous carbs are broccoli, green beans, asparagus, cauliflower, peppers, cabbage, zucchini, green-leafy veggies, etc.

**Fruit – the double edged sword:** First off, fruit is healthy. It is loaded with vitamins, minerals, fiber, and other good nutrients. It is low in fat and low in calories, therefore a good choice for dessert. I think the average person who is just trying to stay healthy and fit, should consume fruit in moderation - perhaps 1-2 pieces a day (although focus more on veggies). However, the main sugar in fruit (fructose) is not broken down very well and not easily converted to glucose.
Therefore, fructose can very easily be stored as body fat. People looking to drop as much body fat as possible or someone wanting to get extremely lean (competitive bodybuilder for example), should avoid fruit all together. So determine your goals, and set your fruit intake accordingly.

Carbs are not the enemy - you need them for energy. Yes, your body can use stored fat for energy when your carbs get low, but it might also break down some muscle, which you don’t want! Carbs have a protein sparing effect, allowing the protein you eat to be used for it’s main functions, rather than for energy. Plus, if your calories get too low because you dropped your carbs too much, your body will hang on to stubborn body fat in a “starvation mode”. So, when you understand the type of carb, the amount consumed, and the timing, you can manipulate them to achieve a great physique.

**Protein:** Protein is required for tissue (muscles, hair, nails, etc ) rebuilding and repair, among other functions. Proteins are created from hundreds of different amino acid combinations. In other words, amino acids are the building blocks of a protein structure. When you eat a protein, your body breaks it down into usable amino acids, which are then used to make new body tissues.

There are 20 different amino acids (AA). And although all 20 are important, your body can make 12 of them. The remaining 8 must come from food. Therefore, these 8 are called the “essential amino acids”. What you need to remember is that not all protein foods are equal. Meaning, not all protein foods are “complete”. A complete protein means it has all 8 essential AA.

For the most part all animal products (fish, chicken/turkey, beef, pork, eggs, lamb, etc) are considered “complete proteins”. This is why they are so important to consume. Now, a vegetarian can still obtain all 8 essential AA by combining certain foods. For example, rice, beans, and corn; milk and cereal; or consuming a variety of nuts, seeds, legumes, and vegetables etc. - therefore eliminating the need to eat meat. However, it’s much easier to get it from quality source. A high quality protein supplement will contain all 8 AA, which could be an option for a hard-training vegetarian.
While protein is important, the body does not prefer to use this substrate as its predominant fuel source. If it must, your body can break down protein and have certain AAs be converted to glucose for energy, but for the most part you don’t want this. Also, your body will catabolism (breakdown muscle tissue) if calories get to low – starvation diets don’t work!

Excess protein not used or excreted by the body can also be converted to, and stored as fat. There are approximately four (4) calories in one gram of protein. Thus, if a food item has 10 grams of protein, the food contains 40 calories of protein (10 grams x 4 calories per gram).

Consume a lean protein with each meal. This not only supplies the body with the right amount of nutrients to repair itself from intense exercise, but it also helps slow the release of insulin, as discussed above. Good sources of lean protein include (chicken/turkey breast, fish, low fat/fat free cottage cheese, lean cuts of beef (top and bottom round, flank steak, etc). lean cuts of pork (pork tenderloin or pork sirloin), egg whites, a high quality protein supplement (like whey, casein, or milk protein isolate), etc.

**Fat:** Most Americans consume too much fat. Furthermore, researchers find that individuals from other countries where the typical diet is low in fat may eventually become “Americanized,” gradually adding fat into their diets, upon moving to and residing in the United States. Fat is found in convenience foods typically found in “fast food” restaurants, margarine/butter, oil, mayonnaise, potato chips, cheese, meats, etc. While the body does need some fat for stored energy, organ protection and other functions, a healthy diet typically consists of 20-25% of fat. There are nine (9) calories in one gram of fat. Thus, if a food item has 5 grams of fat, it contains 45 calories worth of fat (5 grams x 9 calories per gram). Although all fats have 9 calories per gram, not all fat is the same. There are “good” fats and “bad” fats.

*Saturated fats* are considered “bad” fats. Most are solid at room temperature, except for palm and kernel oils. These types of fats can lead to heart disease (clog arteries, etc), and can increase LDL’s –low density lipoproteins (basically bad cholesterol), etc. Examples include animal fat, butter, egg yolks, cheese, full-fat dairy and many condiments, most junk food etc.
Unsaturated fats are considered “good” fats. They can improve your immune system, lower LDLs and increase HDL’s (high density lipoprotein - aka good cholesterol). Good sources include olive oil, nuts, seeds, fish, flax oil, avocados, etc. The majority of the fat you consume in your diet should come from unsaturated sources. Although they are considered healthy fats, they can still make you fat if you consume too much.

**Other Nutrition Info:**

You’ve heard “calories in, calories out” in regards to either gaining or losing weight. It is true that in order to lose body fat more calories need to be burned than consumed, but keep in mind that not all calories are created equal. For example, if someone ate 2000 calories from simple sugars, fat, alcohol, junk food, etc. spread out over 2-3 meals only, and then switched to a “clean diet “ consisting of lean proteins, fibrous carbs, and quality starchy carbs, (spaced out over 5-6 meals), they would lose body fat - even if total calories consumed stayed the same! This is because the metabolism is forced to increase and the types of foods combined are used mostly for energy.

Obese people are actually calorie “efficient” – meaning they don’t need much to maintain their weight, and most (if not all) extra calories are stored as body fat. You want your body to be calorie “inefficient” – meaning your body is not very good at storing calories as fat because the calories eaten are clean, consumed regularly, and in the right portions and combinations – therefore mainly used for energy and to build muscle (assuming a stimulus, like weight training, is taking place).

Another important way to increase your metabolism is to increase your meal frequency – eating 5-6 (or more) times a day. At first, this will be difficult as you’ll feel like you’re eating all the time. But in time your metabolism will increase, and you’ll find yourself constantly ready for that next meal. By constantly consuming proper foods regularly throughout the day, diet-induced thermogenesis (energy used to process the food) is dramatically increased. This is one of the important ways to increase your metabolism.

Eating regularly also keeps blood sugar (glucose) levels steady, which helps insulin levels stay under control. This in turn, means less cravings, less desire to over-indulge, and less chance of glucose being stored as body fat.
So how should carbohydrates, fat, and protein be divided up within the diet?

There are many different macronutrient ratios that can be used for different goals. After establishing the desired amount of calories to be consumed, I personally feel the average person who tries to stay fit by exercising regularly would benefit from a ratio like this: 55% of calories from carbs; 25% from protein; 20% from fat.

Some might say you don’t need this much protein, but with all the benefits of protein, I’d rather keep it up a little higher and my fats a little lower. For example, I’ll see some recommend 60/15/25, where both carbs and fats are higher and protein comes down. It is true this might be all the sedentary person needs to function, but take a look at their body ☺.

A bodybuilder at certain times of the year may consume 50/30/20, or even 35/40/25 (when dieting for a contest.)

A marathon runner might consume 60/20/20. There are basically many different ways to do this. Example: A person who consumes 2000 calories a day, using the 55/25/20 ratios, would look roughly like this:

<table>
<thead>
<tr>
<th>Macronutrients</th>
<th>Ratios</th>
<th>Grams of food</th>
<th>Total calories from each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>55%</td>
<td>275 grams</td>
<td>1100 (4 calories per gram - 4 x 275)</td>
</tr>
<tr>
<td>Protein</td>
<td>25%</td>
<td>125 grams</td>
<td>500 (4 calories per gram - 4 x 125)</td>
</tr>
<tr>
<td>Fat</td>
<td>20%</td>
<td>44 grams</td>
<td>396 (9 calories per gram - 9 x 44)</td>
</tr>
</tbody>
</table>

By adding the calories together in the far right column, you would consume roughly 2000 calories a day using this macronutrient break down.