# PRINCIPLES OF NUTRITION FOR ACTIVE PEOPLE

**By Mark Segal**
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Physical fitness requires both a regular exercise program (preferably including both resistance training and aerobics) and sound nutrition. Indeed, nutrition is probably as important as exercise! The following principles regarding nutrition can contribute to health, strength, and longevity, particularly for active people. Their order does not indicate any priority.

**1. Have small and frequent meals.** This means at least five moderate-size meals (or feedings) per day, approximately every three hours. Each meal should contain complete proteins, some complex carbohydrates, and some fat. Avoid over-eating at any one time. Make some meals smaller and lighter than others, to avoid over-consumption of calories. Dividing daily caloric intake into smaller and more frequent meals keeps metabolism high, provides a constant flow of nutrients for metabolic purposes, and improves the efficiency of digestion. Never skip meals. Instead, have a natural yoghurt with low sugar content, some low-fat milk or soy milk, a meal replacement or protein bar, or a low-carbohydrate shake with protein powder. It is very important to have a good breakfast. The fasting period during sleep is catabolic and should be terminated as soon as possible. Include fast-digesting proteins, healthy fruits (to restock liver glycogen levels), nuts, seeds, or eggs (perhaps more egg whites than yellows). A good breakfast starts the body working right and actually promotes weight loss over time, by reducing hunger during the day.

**2. Consume the right numbers of calories each day.** Active people need approximately 18 Kilo-Calories (Kcals) per pound or 40 Kilo-Calories per kilogram of body weight on a daily basis. This can vary by 5 – 10 percent, depending on body size, level of activity, life-style, and metabolic rate. Know your own daily maintenance level! Divide it by the number of daily meals to determine the optimal average meal size. If one meal exceeds the average size, the next meal should be below it. Keep consumption relatively constant from day to day. But reduce consumption slightly on days with less activity. Consider alternating between phases with somewhat higher and lower consumption occasionally. Consider the possible health benefits of intermittent or temporary fasting. Do not hesitate to have a "cheat day" from time to time.

**3. Find the proper balance between proteins, carbohydrates, and fats.** Each gram of protein and carbohydrate contains 4 Kcals, while each gram of fat contains 9 Kcals. Protein consumption should be at least 25-30 percent of total calories. Carbohydrate consumption should be around 50 percent of total calories. Fat consumption should be at least 20 percent of total calories. Reducing fat consumption below 10 -15 percent of total calories is not healthy, and can impede muscle formation by reducing testosterone levels. Contrary to popular belief, extra fat consumption does not lead to obesity. Extra sugar consumption is much more problematic. And in any event, body fat deposits only increase when caloric consumption exceeds caloric expenditure.

To determine the exact number of grams of protein, carbohydrate, and fat that should be consumed on a daily basis, simply multiply the total number of daily calories by the percentage for each category, and then divide by the number of calories per gram. For example, a person who weighs 200 pounds or 90 kilograms and requires approximately 3,600 Kcals per day, who wants to consume 25 percent of them from protein, would require 900 Kcals from protein, or about 225 grams. This would require five daily meals, each with about 45 grams of protein. It is advisable to consume extra protein on workout days, and reduce carbohydrates on rest days.

**4. Consume sufficient and optimal amounts of protein.** The optimal amount of protein for active sports-people has never been precisely determined. A minimum of one gram per kilogram of body weight is generally considered necessary for everyone. Two grams per kilogram of body weight is suggested for weight lifters, although 1.5 grams per kilogram of body weight may be sufficient. Excess protein serves no purpose beyond providing calories. Some nutritionists claim that extra consumption of protein is harmful, but this has not been proven. And some athletes, particularly weight lifters, consume extremely large amounts of protein, without apparent deleterious effects.

Protein should be complete (contain a complete spectrum of all amino acids). Complete proteins include meat, chicken, fish, eggs, and dairy products. Some combinations of foods also provide a complete protein profile, such as rice and beans. Lean sources of protein are preferable, such as choice cuts of red meat and pork, chicken breast, low-fat dairy products, and egg whites. Whey protein isolate (filtered and ion-exchange) and whey protein concentrate have the highest biological value, and are best for promoting muscle growth.

The body benefits from a constant supply of a complete range of amino acids. Therefore, protein should be consumed every three-four hours, and first thing in the morning. Insufficient protein intake forces the body to break down muscle for its regular needs (catabolism). Any reduction in skeletal muscle, which supports the entire structure of the body, is particularly counterproductive. Protein should be consumed with some carbohydrates, to increase insulin production and improve transport and metabolism, particularly after resistance exercise.

**5. Consume the right kinds of protein at the right time of day.** Whey protein is metabolized quickly. It is therefore suitable for consumption first thing in the morning, before working out, and after working out. Regular milk protein (calcium caseinate) is metabolized more slowly. It is therefore more suitable for the last meal of the day, or a late evening snack, since it provides a constant supply of protein throughout the night. Non-fat or low-fat cottage cheese is an excellent final snack at the end of the day (try it with honey). Some protein powders combine different sources of protein, for complementary affects, and this promotes muscle growth. For example, studies show that a combination of whey and calcium caseinate promotes recovery after weight training. Extra Branched Chain Amino Acids (leucine, isoleucine, and valine, optimally in a ratio of 2:1:1) is important for weight lifters. BCAAs are not metabolized by the liver and go right to work. Extra glutamine is also extremely important for weight-lifters and active people, particularly those who exercise very regularly. Although this amino acid is produced by the body (not essential), temporary deficiencies can occur. The optimal times for supplementing BCAAs and glutamine are in the morning, before and after working out, and in the evening.

**6. Promote thermogenic benefit.** Thermogenics refers to the use of energy to digest food. The "thermogenic effect" is enhanced a) when meals are smaller and more frequent, and b) when protein consumption is higher. In other words, the same total number of calories results in less weight gain a) when it is divided up into smaller and more frequent meals, and b) when the ratio of protein to carbohydrates and fats is increased. When thermogenic processes are maximized in this manner, up to 15 percent of all calories consumed can be used up right away during the process of digestion.

**7. Consume complex instead of simple carbohydrates.** Learn the glycemic index of foods. Complex carbohydrates are digested slowly and do not cause a spike in insulin production. Simple and processed carbohydrates are treated like sugar by the body, and immediately increase insulin production. Therefore, choose whole grain or brown rice over processed or white rice, brown and whole-grain breads over white bread, and whole-wheat pasta over regular pasta. Muesli, oatmeal, and low sugar content cereals are good, particularly for breakfast. The only time that simple carbohydrates

or sugars (such as dextrose and glucose) are preferable or advantageous is right after a serious workout. At this time, stores of glycogen in the muscles must be replenished, and an insulin spike is useful for speeding up the delivery of protein and other nutrients to the muscles. It is also important to consume foods with high fiber content. This includes both soluble and insoluble fiber. Nuts (which have healthy fats) and ground seeds are excellent sources of fibers and nutrients.

**8. Skip or reduce deserts.** Deserts can add hundreds of calories to the diet each day. Since 3,500 calories amounts to an extra pound of body weight, the cumulative effect of deserts over time is considerable. Try savoring a small portion slowly rather than consuming an entire desert, if possible. Sharing a single desert is good practice. And try waiting before having desert. This allows time for digestion of the meal, and may result in reduced desire for sweet deserts.

**9. Eat the right fats, for health and longevity.** Consuming Essential Fatty Acids (EFAs) helps the heart and circulatory system, raises the metabolic rate, metabolizes fat reserves, strengthens the immune system, helps the brain function, builds muscle, and promotes longevity. Polyunsaturated and monounsaturated fats (the Mediterranean diet) are most healthy. Two polyunsaturated EFAs found in plant sources, linoleic acid and alpha-linolenic acid, are important for human health. Cold-water fish (like trout, salmon, and sardines) are optimal sources of two EFAs, EPA (Eicosapentaenoic Acid) and DHA (Docosahexaenoic Acid). They are best when freshly caught, and boiled or lightly grilled. Soy milk (without added sugar) is highly recommended, since it has a lot of protein and healthy fats. EFAs are present in seeds, nuts, and unprocessed/cold pressed oils. Organic ground seeds (like flax, hemp, pumpkin, and sunflower) can be purchased in sealed packages. Try putting them on cereals or in milkshakes. Walnuts, cashews, almonds, and Brazil nuts are recommended, best when freshly opened. Oils from organically grown seeds, cold pressed in the absence of light and oxygen, are an excellent source of EFAs (flaxseed and hempseed oils are excellent). The best book on this subject is "Fats that Heal, Fats that Kill" by Dr. Udo Erasmus. Udo's Choice oils are an excellent option.

Processed oils (from supermarkets) are purified, sterilized, and denatured, at high temperatures and using chemical reactions. This is to facilitate their handling, and increase shelf life and storage time. While this makes the industry more profitable, it unfortunately eliminates all the healthy qualities of the products. The only healthy oil available commercially is extra virgin (unprocessed) olive oil, which has mostly monounsaturated fats. Studies show that daily consumption of extra virgin olive oil has many benefits, including reduced incidence of Alzheimer's disease and cognitive decline.

All saturated fats, including animal fats, are unhealthy above limited quantities (25% of overall fat consumption). Avoid fried foods, fast foods, fatty sauces, potato chips, French fries, cookies, and cakes. In addition to high quantities of saturated fats, these foods can contain trans-fatty acids and partially-hydrogenated vegetable oils, which are extremely harmful to human health.

Note that mega studies indicate that fish oil capsules have no overall positive affect upon long-term health. While their ingredients appear to be the same as natural fish sources, they are not treated the same by the body. Also, be careful about the source of fish. Farmed fish are often raised in unsanitary conditions, and may provide reduced health benefits.

**10. Eat to reduce body fat.** Nutrition can help trigger the body to metabolize fat and reduce fat levels. Eat foods that provide vitamin D, and especially vitamin D3, to support insulin sensitivity of cells, fat burning, and maintain bone strength. Vitamin D is found in salmon, tuna, and eggs. It is also manufactured by the skin in response to sunshine. Omega 3 fats and Monounsaturated Fatty Acids switch on enzymes that promote fat burning in cells. Conjugated Linoleic Acid (CLA), found in meat

and dairy products, helps glucose and fat metabolism. Polyphenols in green tea boost resting metabolic rate. Foods that can reduce fat and in some instances stomach fat (when consumed in moderation) include grass-fed beef, virgin olive oil, coconut, avocado, dark chocolate, and almond butter.

**11. Avoid excess sugar.** Sugars destroy everything from the teeth to the immune system. The massive increase in sugar consumption over the past century has contributed to a wide range of health problems, from diabetes to cancer. Sugars (except to a certain extent fructose) cause unhealthy insulin spikes. They are readily converted into and stored as fat. Non-fat foods containing large amounts of sugar are neither dietetic nor healthy. One can of soda has ten teaspoons of processed sugar. It is very important to avoid sugar late at night. The insulin spike can interfere with proper sleep patterns.

**12. Avoid artificial sweeteners.** Artificial sweeteners are extremely harmful to human health, and are associated with a multitude of adverse medical conditions. Unfortunately, they are being consumed in mass quantities, on a daily basis, by people of all ages. Artificial sweeteners are present in a very wide range of products, from diet sodas to light foods to protein powders to medicines. All artificial sweeteners should be strictly avoided, but most particularly aspartame, sucralose, and acesulfame potassium. For this purpose, it is necessary to read labels very carefully. Sometimes code names and reference numbers are used, to mislead consumers. Unfortunately, these chemicals are placed in most commercially available protein powders. Look for unsweetened/unflavored or natural protein powders. In the alternative look for Stevia, a natural plant-derived sweetener, which is by far the best choice. Unfortunately, not all types of Stevia are the same, or offer the same advantages.

**13. Use the right dressings on salads.** Some salad dressings contain large amounts of calories and fats. The healthiest dressing for salads is extra virgin olive oil and vinegar. Extra virgin olive oil, which is rich in monounsaturated fats, is a key part of the Mediterranean diet. Vinegar (especially from grapes and apples) promotes weight loss and has other healthy attributes. Vinegar has been shown to slow the metabolism of starches and sugars. As a result, sourdough bread has a lower glycemic index. Balsamic vinegar is a good choice.

**14. Limit alcohol consumption.** Alcohol interferes with many bodily functions, has many calories, consumes vitamins, and adversely affects nutrition. Alcohol is particularly likely to result in weight gain when consumed late at night or before bedtime. The only alcoholic drink that has been shown to have some beneficial effects is red wine. It contains healthy ingredients from grapes, such as polyphenols, flavonids, and procyanidins, which can be beneficial for the body and heart, when consumed in moderation. Similar benefits can be obtained by eating red grapes.

**15. Increase body muscle content and reduce body fat content.** Muscle is more biologically and metabolically active than fat. Of two individuals with the same weight, all other factors being equal, the one with the higher muscle content will burn up to forty extra Kilo-Calories per pound or 100 extra Kilo-calories per kilogram of extra muscle each day. To lose weight, reduce fat levels, and improve health, it is important to increase muscle mass through resistance exercise (like weight lifting). Reducing caloric intake is not a sustainable means for losing weight. Indeed, after as little as one week, reduced caloric intake causes the body to compensate by reducing the metabolic rate and daily caloric maintenance level. This is a biological reaction to requirements for survival during times of scarcity, built into our species. As a result, after a period of reduced consumption, return to the prior maintenance level of caloric intake causes weight gain and fat storage. This is why most fat-reduction programs soon fail. In addition, dieting causes loss of muscle, particularly skeletal muscle. So, both eating and exercise should be geared towards building muscle and reducing body fat content. Don't focus too much on weight! Gaining muscle and losing fat is better than losing weight.

**16. Get in the habit of reading food labels.** Learn how much protein, carbohydrate, fat, sugar, salt, fiber, vitamins, minerals, and chemicals are in your favorite foods. Pay particular attention to the amount of carbohydrate which is simple sugar, if this is indicated. What additives, sweeteners, food colorings, preservatives, and other chemicals are present? Is there extra salt or sugar? Some foods are notoriously mislabeled. Fruit juice, for example, is often not 100% juice. It may have extra sugar added, or be mostly sugar water, with only minimal fruit content (and still be called "natural"). Some fruit juices now contain artificial sweeteners, for no purpose other than commercial gain.

**17. Don't sleep or exercise within one hour of a meal.** It is unhealthy to lie down after eating. A relaxing stroll is the best idea. Further, it is important to avoid staying seated for too long, since the muscles and metabolism shut down. Recent studies indicate that spending long periods of time seated doubles the risk of death, regardless of other factors (such as regular exercise and sound nutrition). The best way to burn fat and increase the metabolism is to perform aerobics first thing in the morning on an empty stomach (or after consuming some protein without carbohydrates). Otherwise, nutrients in the blood stream are utilized before fat deposits. But only people who can exercise without having eaten should do this. Finally, it is important to wait at least one hour for food to digest before starting to exercise. Pre-workout meals should be light. Fruit provides energy, and whey protein prevents catabolism (muscle burning) during exercise.

**18. Consume healthy fruits and vegetables every day.** Fruits, vegetables, nuts, and seeds are the best sources of micronutrients like vitamins, minerals, and anti-oxidants. The healthiest choices are prunes, kiwi, citrus fruits, apples, berries (especially blueberries), broccoli, spinach (instead of iceberg lettuce), onions, garlic, sunflower seeds, almonds, walnuts, pecans, Brazil nuts, etc. An apple a day really does keep the doctor away (best as a snack between meals, at least thirty minutes before eating, or some time before a workout). Grapefruits and grapefruit juice help control weight (but affect metabolism of many medicines). Fruits such as papaya and pineapple have beneficial enzymes. It is a best practice to make salads as colorful as possible.

Be careful about the origin of fruits, since the nutritional value of fruits and vegetables varies greatly. Much depends on the quality of the soil, environmental and weather conditions, timing of the harvest, handling, transportation, storage conditions, storage time, and related factors. For example, tomatoes grown in selenium-depleted soil lack this crucial mineral. Oranges stored too long lose their vitamin C. It is also important to wash fruits thoroughly in clean water. This helps remove pesticides and contaminants. Even fruits that are peeled (such as oranges) should be washed. They may have been handled by people under unsanitary circumstances. Otherwise, the fruit inside can become contaminated, once hands and utensils touching the peel become contaminated.

Consuming fruits and vegetables on an empty stomach may be optimal for metabolizing nutrients. This would mean that it is less beneficial to have fruit for dessert after a large meal. However, some fat must be present for the body to process fat soluble vitamins, such as Vitamins A, D, and E. It may be useful to have fresh fruit first thing in the morning, followed thirty minutes later by a protein shake with cereal, oatmeal, an egg white omelet, etc.

**19. Get all necessary vitamins and minerals on a daily basis.** Get your daily vitamins from whole foods. "Pharmaceutical" vitamins and minerals are not absorbed as well by the body. However, it is not always possible to assess the nutritional value of food. Thus, even at the risk of "expensive urine", it may be worthwhile to supplement with multi-vitamin and mineral pills on selected days. Try to maintain constant levels, without spikes and declines. Avoid multi-vitamins with mega doses of certain vitamins, such as the B vitamins. If a vitamin pill is too hard, it may need to be chewed;

otherwise it can pass out of the body unabsorbed. Magnesium and zinc before bed is an excellent combination. Studies show that many people, and particularly athletes, are deficient in both of these minerals.

**20. Consume anti-oxidants for health and longevity.** Anti-oxidants destroy free radicals and support numerous bodily functions. Optimally, anti-oxidants should be obtained from fresh foods. Tomato products contain lycopene, also found in watermelon, but not available from any other source. Interestingly, lycopene content is enhanced through cooking and processing, but note that ketchup and tomato sauces sometimes contain excessive amounts of sugar. Vitamin E should come from natural sources, and contain mixed tocopherols, not just d-alpha tocopherols. Check the label, since dl-alpha tocopherol is an artificial pharmaceutical product, which is not nearly as beneficial. Take vitamin E with vitamin C and selenium, for synergistic affects. Alpha Lipoic Acid (ALA) is another excellent anti-oxidant, which is both water and fat-soluble.

**21. Cultivate friendly bacteria.** Probiotics are friendly organisms which are crucial for the digestive system and many bodily functions, including fighting off a myriad of diseases. They include acidophilus and bifidobacteria. Look for probiotics in cultured yoghurts, Actimel type drinks, kfir, and special pills/liquids (best refrigerated). Check the actual concentration carefully. Remember that our bodies contain ten microbes for every human cell. In other words, we are a "walking ecosystem". Keeping this ecosystem in balance is crucial for health, well-being, and optimal physical performance.

**22. Drink Green Tea.** Green tea has high concentrations of helpful anti-oxidants. It is associated with health, weight loss, and longevity. Regular and black teas are also healthy, but are more processed, and may have fewer beneficial effects. Green tea extract is available in pill/capsule form, but natural sources are far better.

**23. Eat dark chocolate.** Dark chocolate has a number of natural anti-oxidants and flavonids which are heart-friendly. Dark chocolate should have a high percentage of cacao, at least 70 percent. Milk chocolate and white chocolate are not healthy. Note that chocolate is extremely high in fat, and therefore must be consumed in limited quantities.

**24. Drink plenty of water.** Many people do not consume enough water. Active people should drink up to a few liters daily. Sparkling water with natural lime juice is an excellent alternative to sodas and artificial drinks. Starting the day with fresh lemon juice in warm water is an ancient Ayurvedic practice. Adding some psyllium fiber (to promote regularity), cinnamon, and perhaps a touch of maple syrup, turns this morning drink into a powerful energizer. Be sure to wait at least twenty minutes before having any food. This morning drink can be followed up by an apple with fresh garlic before breakfast. This three-stage breakfast is a great way to prepare for hitting the gym.

It is best not to have too much water with meals. Be careful about the sources of water. All bottled and tap water contains impurities like metals, salts, chemicals, small quantities of prescription medicines (sometimes dozens), and perhaps even bacteria. Water in plastic bottles may absorb harmful chemicals. Bottled water is not always better than tap water. It can contain chemicals and excess minerals, and is sometimes nothing more than bottled tap water. Small amounts of distilled water are OK.

**25. Consume spices and herbs.** Many spices and herbs have important therapeutic effects. Among them are pepper (particularly cayenne), garlic, cinnamon, parsley, nutmeg, oregano, dill, thyme, and rosemary. Some herbs have special properties, such as ginseng and saw palmetto (for prostate function). Different kinds of algae have extremely healthy properties. Milk thistle (silymarin) may

support liver function, and has been used for centuries. When supplementing with herbs, be careful about the quality, concentration, and dosage, which can vary. Be especially careful about mixing herbs, and combining them with pharmaceutical medicines. Keep in mind that a large percentage of commercially available herbal remedies do not contain the concentration or quantity advertised, and often contain harmful impurities (poor quality control).

26. **Know what category of active person you are**. There are five categories of lifestyle, according to different levels of and approaches to physical activity. Each category represents a lifestyle that both generates and reveals personal characteristics, and significantly affects nutritional requirements. In other words, personal activity levels shape and reveal a great deal about who we are, how we work, and how we relate to other people, as well as our physical condition and nutritional practices.

| CATEGORIES OF PHYSICAL ACTIVITY | | |
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| | CATEGORY | CHARACTERISTICS |
| I | Sedentary | Low level of physical activity. Passive profession or job. Generally not interested in engaging in physical activity or sports. This has serious consequences for health and physical condition. |
| II | Active | Active lifestyle, but without a regular exercise regime. Studies show that active people, who walk a lot, do gardening and chores, etc. can obtain many of the benefits of regular exercise. |
| III | Exerciser | Regular exercise regime, but no competitive sports. Regular use of gyms, probably for both weight training and aerobics. Some sports activities, but geared towards personal development, without competition. |
| IV | Athlete | Serious exercise regime and active participation in sports, with competitive spirit. Training oriented towards performance and achieving results in selected sports. Sports may be individual or group, with different consequences. |
| V | Professional | Sports or physical activity are used to earn a living. Professional and much of personal life are devoted to winning performance. Sports may be individual or group, with different consequences. |

People in each category share certain personal characteristics and nutritional requirements. The three main criteria are a) whether a person is truly dedicated to exercise, b) whether a person competes, and c) whether competition is in an individual or group sport. Note that people who have competed as athletes or professionals generally continue to have a competitive spirit or mentality after retirement, even though they are better characterized as an Exerciser. Know your category and level of activity, and adjust your nutritional requirements and eating practices accordingly.

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