

***Body-Building
Nutrition***

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Diet Facts, Fallacies and Strategies for Building Muscle and Burning Fat

by Jeffery Stout, Ph.D.

If the human body could list its top-10 most efficient processes, adaptation would probably rank number one. Evolution over millions of years has turned the species into a form that's geared not for the production of a slim waist or muscular arms, but for survival. In ages past, periods of famine were common. Yet the human race prevailed. The catch, unfortunately, is that those who have a considerable propensity to store fat survived. Thus, the 20th-century human is someone who has adapted to years of food shortages through a nauseating ability to maintain a pear-shaped torso. So much for survival of the fittest.

Consequently, when the innocent dieter initiates a restrictive diet, the body's response is to kick into survival mode. That, in essence, is a signal to store fat to offset an anticipated period of insufficient calorie intake. Compounding matters is a gradual decline of the body's metabolism, rendering the task of fat loss even more difficult.

The process is no different from any other the body performs when encountering change—it adapts. Instead of perceiving food as the culprit, you should view it as fuel. Food is fuel for an increasing metabolism, fuel for the release of fat-burning and muscle-building hormones and, finally, fuel for a healthy diet and a normal lifestyle. When you eat food in precise amounts, your body must adapt; however, it adapts to the notion that it will get the energy it needs. When it does, your body will respond with its own goodwill gesture, a liberation of its suddenly unnecessary fat stores.

Facts and Fallacies of Food

All food can be separated into three basic types: proteins, carbohydrates and fats. Together they form the basis of all diets and, along with exercise, ultimately determine changes in body composition.

You achieve such changes through hormonal release, an increase in metabolism and the preservation and enhancement of muscle tissue.

Proteins are considered the body's building blocks for muscular repair, maintenance and growth. Adequate protein intake ensures the preservation of muscle tissue and enhances recovery from both strenuous workouts and daily activities. Since exercise causes significant damage to muscular tissue and subsequent growth requires adequate recovery, protein is often the missing factor. If you don't take in enough protein, your muscle may not be spared and you'll experience appreciable decreases in metabolism.

Fallacy 1: The RDA for Protein Is Sufficient

The recommended dietary allowance, or RDA, for protein is approximately .36 grams per pound of bodyweight. Based on that, a 200-pound man would require a mere 72 grams of protein daily. That may be sufficient for a sedentary individual, but when you factor in strenuous activity such as endurance or weight training, the RDA is grossly inadequate. In fact, research studies have suggested that consuming the RDA for protein during periods of intense training may lead to loss of muscular tissue.^{1,2} It's apparent that protein requirements depend on an individual's activity level, to the extent that a range between .64 and .91 grams of protein per pound of bodyweight is appropriate.^{1,2}

The body's primary fuel for energy is derived from carbohydrates. They're especially important for aerobic activities and high-volume weight training and are also used during periods of recovery. As with protein, inadequate intake of carbohydrates can compromise exercise performance and duration; however, based on the recommendations of most dietitians, you might mistakenly believe

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that there are no perils involved in carbohydrate consumption.

Fallacy 2: The More Carbs the Better

Contrary to what's often uttered about the merits of carbohydrates, the fact remains that excess carbs lead to excess inches. With the exception of the overly lean individual who has a speedy metabolism, a situation in which weight gain is often the goal, overindulgence in high-carb foods can be as detrimental to waistlines as excess fat. While many people believe that spare carbohydrates are in large part stored for energy, it's more likely that excess carbs will be converted to bodyfat.³ Furthermore, studies have shown that subjects can achieve identical improvements in body composition, strength and muscular endurance with diets in which as little as 40 percent of the calories come from carbohydrates vs. those that contain more than 60 percent carb.^{4,5} Studies have also repeatedly demonstrated that the total calorie intake is the dominant factor in weight loss.^{6,7}

It's obvious that fats have endured more than their share of abuse. Saturated fats, in particular, are considered a key contributor to heart disease, an epidemic that's claimed more lives than the flood in Genesis. Fats also carry more than twice as many calories per gram as either carbohydrates or protein. Though it's true that an excessive fat intake is the best way to make yourself resemble a blimp, it's also a fact that fat is necessary for proper metabolic function, for hormone production and as an energy source.

Table 1: Glycemic-Index Rankings of Foods

(All foods are rated in comparison to white bread, which is scored 100)

High	Moderate	Low
Instant rice (128)	Ice cream (87)	Grapefruit juice (69)
Crispix cereal (124)	Cheese pizza (86)	Green peas (68)
Baked potato (121)	White rice (83)	Grapes (66)
Cornflakes cereal (119)	Popcorn (79)	Linguine (65)
Rice Krispies cereal (117)	Oatmeal cookies (79)	Macaroni (64)
Pretzels (116)	Brown rice (79)	Orange (63)
Total cereal (109)	Spaghetti, durum (78)	Peach (60)
Doughnut (108)	Sweet corn (78)	All-Bran cereal (60)
Watermelon (103)	Oat bran (78)	Spaghetti, white (59)
Bagel (103)	Sweet potato (77)	Apple juice (58)
Cream of Wheat (100)	Banana (77)	Apple (54)
Grapenuts cereal (96)	Special K cereal (77)	Vermicelli (50)
Nutri-grain bar (94)	Orange juice (74)	Barley (49)
Macaroni and cheese (92)	Cheese tortellini (71)	Fettucine (46)
Raisins (91)	Chocolate (70)	Lentils (41)

Fallacy 3: Avoid Fat Entirely

Most American diets contain either too little or too much fat. Neither method is a successful tactic for weight loss. When examining what occurs with most restrictive diets, people assume that all dietary fat can only be deposited in adipose tissue. That's absurd. In reality the body uses dietary fat for energy when it's in a state of negative energy balance.⁸ As long as your total calorie intake is less than what you expend, the percentage of fat in the diet isn't as significant as was once thought. Studies have also affirmed that subjects can achieve equivalent differences in weight loss with diets consisting of approximately 10 to 50 percent fat, as long as the total calorie consumption is identical.^{6,7}

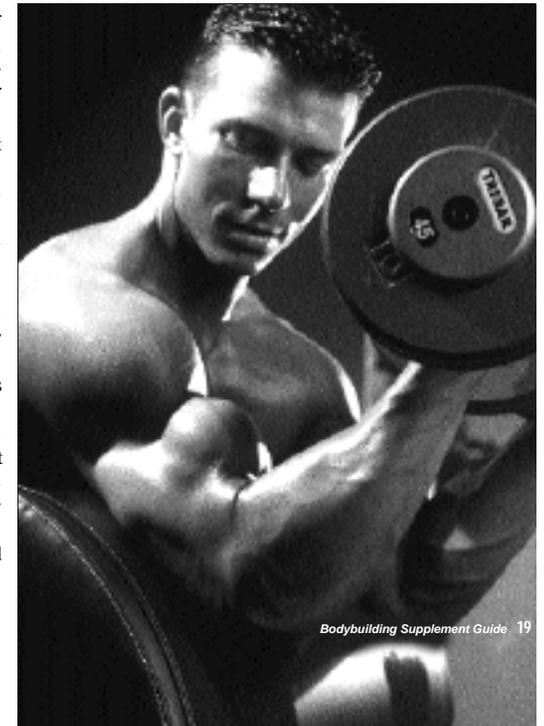
It's evident that the low-calorie, lowfat, high-carbohydrate diets that dietitians and others have been advocating for years are in fact fallacies. (More on the essential fats in Chapter 6.)

All Carbohydrates Are Not Created Equal

Now that you know to avoid excess carbohydrates, it's time to look at the type of carbs you should eat. Though all carbohydrates break down into glucose and are released into the bloodstream, the speed at which the process occurs varies drastically with different carbohydrates. The absorption rate is a critical factor in energy levels, fat reduction and overall health. Foods have been assigned a glycemic-index rating, a measure of how fast their carbohydrates enter the bloodstream to be used as energy or stored as glycogen, a preserved form of energy. High-glycemic foods are available quickly for use as energy; while that may seem optimal, in actuality they trigger a hormonal reaction that has reverse effects.

High-glycemic carbohydrates produce a rush of glucose into the bloodstream, elevating blood sugar levels dramatically. The sudden rise stimulates a release of the hormone insulin, which essentially negates the high-energy effects of glucose. The rapid release of insulin shuttles the glucose out of the bloodstream, effectively dropping energy levels to lethargic lows. To make matters worse, it also takes the fatty acid energy source with it, shoveling it into the fat cells for storage. High-glycemic foods, therefore, carry a double curse, keeping you fat and lazy.

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In the past experts recommended that foods high in simple sugars—such as candy, cookies and soft drinks—be avoided for the aforementioned reasons. While that's true, many revered energy sources are also considered high-glycemic foods. Surprisingly, many kinds of pasta, rice and potatoes rank rather high on the glycemic index. Breads and cereals are also often offensive, fast enough to zap energy levels and hoard fat.

Fortunately, you can get the opposite results with low-glycemic foods. They provide more stable energy levels and a slower insulin response, favoring the probability of productive workouts and sustained vitality. Those foods rank in the below-70 category on the glycemic index chart (see Table 1).

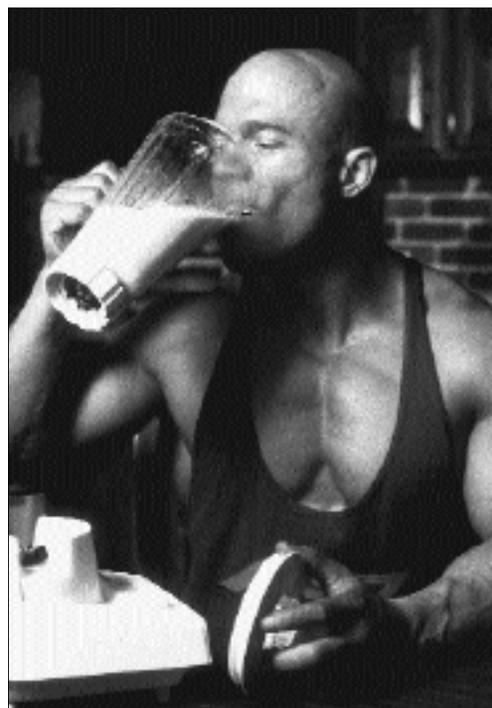
Since foods are usually eaten in combinations, the glycemic index of a meal is usually lower than the glycemic index of its highest constituent. For instance, if you combine equal calories from a bagel and an apple, the glycemic index of that meal becomes more acceptable.^{7,9} Protein also helps matters, as protein foods efficiently decrease the total glycemic index of what you're eating by slowing the absorption rate of the carbohydrates. That emphasizes the importance of combining protein and carbohydrates in each meal.

Food: A Potent Hormone Trigger

As discussed above, the hazards of one hormone, insulin, are encouraged when you eat high-glycemic foods. While insulin promotes fat storage, growth hormone, or GH, effectively burns fat, builds muscle and improves the immune system. That provides another advantage to low-glycemic foods. If you emphasize low-glycemic foods and stable blood sugar, you have a positive environment in which GH can exert its effects.^{6,3}

The actions of the muscle-building hormone testosterone are chiefly influenced by the percentages of foods in the diet. Therefore, the percentages of protein, carbohydrates and fat can have dramatic effects on changes in body composition. For instance, if you want to add muscle rapidly, a low protein-to-carbohydrate ratio and a moderately high fat intake are necessary for maximal testosterone output.^{10,11} That's not to suggest that you should reduce protein intake but, rather, that the percentage of carbs in the diet should be somewhat greater than the protein.¹⁰ Furthermore, the source of food also influences testosterone concentration; for example, a vegetarian diet produces much lower testosterone levels than a meat-rich diet.¹²

A diet high in red meat, however, also contains an abundance of saturated fats. Though the reasons for avoiding saturated fats are well established, such as their contribution to heart disease, other forms of fat can be quite beneficial for normal metabolism and hormone production. For example, the fat in fish is valuable. In addition, olive, sunflower and canola oils are rich in monounsaturated fatty acids, a form of fat that's a powerful stimulant of testosterone.¹⁰



The Importance of Nutrient Timing

The number and content of daily meals is an extremely important but overlooked facet of proper nutrition. The timing and quality of foods you eat, especially pre- and post-workout, often means the difference between a successful diet and another failed attempt at physique enhancement. Skipping breakfast, avoiding postworkout meals and consuming high-glycemic carbohydrate

before workouts can easily transform a sound meal plan into a disaster. In addition, even the most sensible diets ignore the crucial nature of nutrient timing.

Elevating the metabolic rate is one of the most efficient ways to burn fat. The process of digestion of meals requires calories by itself, so the more often your body must break down food, the more efficient it becomes. Therefore, you should eat small meals throughout the day to maximize your metabolic response—and breakfast is the most important meal of the day, although the postworkout meal may be equally important. Studies have shown that diets that include a large breakfast result in significantly greater fat loss than diets that avoid it. Since the metabolic rate is fastest in the morning and slows throughout the day, it's more likely that the calories you eat at breakfast will be used by the body and not stored as fat. Skipping breakfast, on the other hand, may result in vital losses of muscle and a subsequent decrease in metabolism.

The postworkout meal is equally essential for much the same reason. Your body exhibits an elevated metabolic rate after you exercise, much as it does when you awaken. Not eating food after you exercise, therefore, results in muscle tissue breakdown and, of course, a corresponding tumble of the metabolic rate. Research has proven that the rate of protein synthesis doubles following exercise and remains elevated for

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more than 24 hours.^{13,14} In other words, the body is primed for the acceptance of protein for muscle maintenance and growth. Equally important is the need for consuming plenty of carbohydrates. After you work out, your body is somewhat depleted of its glycogen stores. Remarkably, studies have shown that high-glycemic carbohydrates are the preferred source for replenishing the body's energy stores after training.¹⁵ Not only does that result in greater storage for recovery and subsequent workouts, but it also significantly decreases muscle breakdown.¹⁶

Postworkout meals should contain about twice the normal amount of carbohydrates and protein, and you should eat them immediately following exercise. For example, if you were eating five meals per day and 3,000 calories, your postworkout meal would be approximately 1,000 calories, while the other four meals would average 500. Postworkout meals should also contain a larger percentage of protein than preworkout meals to keep up with the body's elevated protein synthesis rate.

People make a lot of mistakes with the preworkout meal. How many fitness enthusiasts eat a bagel before exercise? Due to their alleged energy benefits, bagels are a popular preworkout food, but if you look at their glycemic index, it's a whopping 103. The detrimental effects of eating such high-glycemic carbs before training are monumental. The corresponding insulin response will not only decrease energy stores for exercise, but it will also prevent fat breakdown. Fortunately, low-glycemic foods have much the opposite effect. They improve exercise performance without significantly compromising energy stores after a workout.^{9,17} That, in turn, leads to enhanced recovery and accelerated progress.

Consistency

A suggested meal plan [such as the one at the back of this book] isn't perfect. You'll need to tinker in order to determine the ideal diet for you. Building a physique takes time, dedication and consistency, and losing or gaining weight should be a gradual process to ensure the right kind of changes. Don't rush it, stay focused and consistent, and you'll move ever closer to physical excellence.

Editor's note: Jeffery Stout, Ph.D., received his doctorate in exercise physiology from the University of Nebraska-Lincoln and is certified by the National Strength and Conditioning Association. He specializes in neuromuscular fatigue, body composition and ergogenic aids and has published more than 70 manuscripts, abstracts and national presentations in nationally and internationally recognized journals. He's currently an assistant professor and the director of the Human Performance Research Laboratory at Creighton University in Omaha, Nebraska. In addition, he serves on the editorial board for *Medicine and Science in Sports and Exercise* and the *Journal of Strength and Conditioning Research*.

References

- ¹ Tarnopolsky, M.; MacDougall, M.; and Atkinson, S. (1988). Influence of protein intake and training status on nitrogen balance and lean mass. *J Appl Physiol.* 65:187-193.
- ² Lemon, R. (1991). Protein and amino acid needs of the strength athlete. *Int J Sport Nutr.* 1:127-145.
- ³ Bagghle, T. *Essentials of Strength Training and Conditioning.* Champagne, Illinois: Human Kinetics. 1994.
- ⁴ Rinchart, K. Effects of diet on muscle strength gains during resistive training. In: *Muscle Development: Nutritional Alternatives to Anabolic Steroids.* Columbus, Ohio: Ross Laboratories. 1987. 78-82.
- ⁵ Van Zant, R.; Conway, J.; and Seale, J. (1992). Effects of dietary carbohydrate restriction on high-intensity exercise performance. *Med Sci Sports Exerc.* 24:S71.
- ⁶ Alford, B.; Blankenship, A.; and Hagen, R. (1990). The effects of variations in carbohydrate, protein and fat content of the diet upon weight loss, blood values and nutrient intake of adult obese women. *J Am Diet Assoc.* 90(4):534-540.
- ⁷ Golay, A., et al. (1996). Similar weight loss with low- or high-carbohydrate diets. *Am J Clin Nutr.* 63(2):174-178.
- ⁸ Walberg-Rankin, J. (1995). A review of nutritional practices and needs of bodybuilders. *J Strength and Cond Research.* 9(2):116-124.
- ⁹ Kirwan, I., et al. (1996). A low-glycemic meal 45 minutes before exercise improves performance. *Med Sci Sports Exerc.* 28(8):8768.
- ¹⁰ Volek, J.; Kraemer, W.; Bush, J.; Incledon, T.; and Bocics, M. (1997). Testosterone and cortisol in relationship to dietary nutrients and resistance exercise. *J Appl Physiol.* 82(1):49-54.
- ¹¹ Reed, M., et al. (1987). Dietary lipids and resistance exercise: an additional regulator of plasma levels of sex-hormone-binding globulin. *J Clin Endocrinol Metab.* 64:1083-1085.
- ¹² Raben, A., et al. (1997). Serum sex hormones and endurance performance after a lacto-ovo vegetarian and a mixed diet. *Med Sci Sports Exerc.* 24:1290-1297.
- ¹³ MacDougall, J., et al. (1995). The time course for elevated muscle protein synthesis following heavy resistance exercise. *Can J Appl Physiol.* 29(4):480-486.
- ¹⁴ Biolo, G., et al. (1995). Increased rates of muscle protein turnover and amino acid transport after resistance exercise in humans. *Am J Physiol.* 268(3):E514-520.
- ¹⁵ Burke, L.; Hargreaves, M.; and Collier, G. (1993). Muscle glycogen storage after prolonged exercise: effect of the glycemic index of carbohydrate feedings. *J Appl Physiol.* 74:1019-1023.
- ¹⁶ Roy, B., et al. (1996). The effect of oral glucose supplements on muscle protein synthesis following resistance training. *Med Sci Sports Exerc.* 28(5S):S769.
- ¹⁷ Thomas, D.; Brotherhood, J.; and Miller, J. (1994). Plasma glucose levels after prolonged strenuous exercise correlate inversely with glycemic response to food consumed before exercise. *Int J Sport Nutr.* 4(4):361-373.

Additional References

- Anderson, K., et al. (1987). Diet-hormone interactions: protein/carbohydrate ratio alters reciprocally the plasma levels of testosterone and cortisol and their respective binding globulins in man. *Life Sci.* 40:1761-1768.
- Foster-Powell, K., and Miller, J. (1995). International tables of glycemic index. *Am J Clin Nutr.* 62(1):8715-8905.
- Kenn, N., et al. (1997). Weight loss is greater with consumption of large morning meals and fat-free mass is preserved with large evening meals in women on a controlled weight-reduction regimen. *J Nutr.* 127(1):75-82.
- Rabinowitz, D., and Ziebler, L. (1963). Suggested variations in plasma insulin and HGH concentrations during one feast-famine cycle. *Nature.* 199:913-915.