

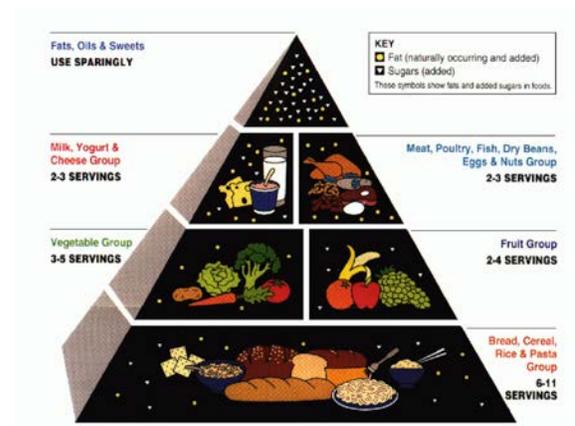
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Fuel Intake

NUTRITION and SUPPLEMENTATION

Training the body to throw harder and stay healthy requires paying attention to nutrition and supplementation because protein synthesis, fat loss, and energy development all depend on what fuel is put into the body. Hundreds of books and research studies have been published on the topic and many of the conclusions are very confusing. This chapter in no way attempts to “solve” nutrition for athletes. However, it will give you a good understanding of the basics and intermediate concepts of nutrition and supplementation as they pertain to training baseball players and athletes in general.

The most efficient way to boil down nutrition to a few simple guidelines is to first admit that the nuances of food intake will be lost. These maxims are meant to capture 80% of the efficiency of optimal nutrient consumption; the final 20% can be gleaned through rigorous review of research studies and authorities on the topic if interested.



At least everyone admits this food pyramid is no longer useful.

Nutrition Maxim #1: The Laws of Physics Reign

Physics lays the groundwork for all nutrition, because biology does not trump the laws of thermodynamics. The law of thermodynamics is an alternate version of the law of conservation of energy, which essentially states that energy cannot be created or destroyed. On a more topical level, it means that **calories in equal calories out**.

Modern dietary trends tend to ignore this fact by perpetuating diet systems that solve all of your problems, such as paleo dieting, the Zone diet, ketogenic dieting, carb cycling, intermittent fasting, and many other methods. Make no mistake that the laws of physics dominate any and all dietary systems. What perpetrators of these diets tend to confuse are the concepts of satiety, efficiency, and macronutrient profiling.

Satiety is essentially the concept of “feeling full.” Proponents of the ketogenic diet reject eating any carbs, saying that it is impossible to overeat pure protein and fat. This may very well be true, since protein has a very high satiety score (imagine eating 500 calories of deli turkey compared to 500 calories of chocolate candy for a simple understanding), but that doesn’t change the fact that energy is energy. It is also more difficult to convert protein into fat due to nutrient preferences in the body, which is a discussion of efficiency and not a way to get over one of the laws of nature. Eating more protein is undoubtedly better than eating more carbs (of any kind), but, again, this is not a violation of the conservation of energy. It is a discussion of **macronutrient profiling**.

Any good diet will respect that basic fact, because a diet by itself requires athletes to understand where

they begin and where they want to end. If an athlete is 6’ 1” 135 lb., putting them on a ketogenic diet is probably one of the most ridiculous things possible, because ketogenic diets generally cause massive undereating and weight loss (not to mention the side effects of not consuming carbohydrates and how this affects athlete performance). A typical MLB pitcher is around 6’ 2” and over 200 lb. The only way to gain 70 lb. is to increase caloric intake in such a way that it overtakes the balance of energy in the body, therefore gaining weight.

Of course, “good weight” is different than simply eating ten tons of cookies; we are absolutely not suggesting that. Which bring us to our next point.

Nutrition Maxim #2: Optimal Nutrient Profiling

A good diet focused on athletic performance focus around one major concept: the amount of protein consumed and the timing of when the protein is eaten. The first part is far more important than the second part, and a general rule of thumb is that lean athletes should attempt to consume **1 gram of protein per pound of bodyweight**. If an athlete is excessively thin, then this ratio should increase in step with the fact they will be eating more calories to gain weight. If an athlete is overweight, then he should consume the suggested amount of protein and limit the other dietary macronutrients for body-recomposition purposes.

Research indicates that the most efficient amount of protein that can be synthesized in the human body is 25-40 grams in a single serving. Fortunately enough, this is about the amount in a single serving of chicken breast or a particularly high-quality protein shake. Consuming more than 40 grams

won't cause kidney failure, but it is less efficient than spreading consumption of protein out over the day's schedule. Having consistent sources of protein in an athlete's diet is usually the best bet: eggs for breakfast, servings of meat at lunch and dinner, and a pair of protein shakes in the day with one saved for the post-workout phase often bring the total consumption of protein right in line with the overall goals of the athlete.

Nutrition Maxim #3: Supplements are for Supplementation, not Replacement

Supplements derive from the word "supplementation," which literally means to enhance or to add an extra amount to something. It does not mean to *replace* something. In fact, if an athlete plans on playing under the guidelines of the NCAA or MLB, they will be subject to randomized drug tests, so supplementation must meet the following three rules:

- ▶ *It must be effective/safe*
- ▶ *It must be legal*
- ▶ *It must be inexpensive*

The last bullet point is an opinion shared within our company, but fortunately there are very few expensive supplements that are effective and legal, so athletes aren't missing out on much. Here's a simple list of supplements that meet the above criteria as proven through multiple research studies and experimentation in the athletic world:

Creatine monohydrate supplementation increases creatine phosphate (CP) levels in the body in most trials, and CP is the main source that helps replen-

ish adenosine triphosphate (ATP) pools, which power the muscles during high-intensity exercise. While creatine phosphate is naturally occurring and found in protein-rich foods, primarily red meats, supplementation is very effective at bringing natural levels up. If this is all creatine did for the body, it'd be worth supplementing since it's very inexpensive. However, research shows that creatine has many more benefits, such as improved cognition, minor boosts in testosterone, and reduced fatigue. Mixing in a heaping teaspoon (about 5 grams) in your protein shake or water bottle is fine, and getting the cheap stuff is also adequate.

You don't not need to have a "loading phase" or buy expensive creatine variants; no research supports the idea that these are any more effective than plain-old creatine monohydrate.

Fish Oil, more accurately known as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), naturally occurs in certain types of fish—particularly salmon. EPA and DHA supplementation has been shown to help reduce inflammation (though at high-dose levels), reduce blood pressure, lower triglycerides, and even lower depression-like symptoms. The most efficient way to consume fish oil is to buy a bottle of the liquid and chug it, but since that's pretty gross, most places sell capsules for consumption. Be aware that most supplement makers will sell 1-g capsules, but they'll generally contain 300-600 mg of EPA and DHA, so be sure to look at the nutrition label. Athletes will be looking to supplement at least 1-g of EPA and DHA per day, and perhaps up to 3-5 grams in the short-term if they are having inflammation-based problems. For maximum benefit, the capsules should be taken with food spread out over the course of the day.

Vitamin D, also known as cholecalciferol (D3), is

synthesized in the skin when exposed to the sun's radiation. People in the northern part of the United States are almost always deficient in levels of D3 during winter. D3 has a significant amount of research backing it for general-health purposes and athletic-training functions: increased levels of D3 are correlated with increased high-intensity athletic performance, lower blood pressure, less chance of fatigue, and lower rates of depression.

Research shows that the safe upper limit of dosing is about 10,000 IU per day for D3 and that it's best to take it with some sort of fat—consuming it with fish oil makes for a handy pairing. The recommended dose for athletes is about 2,000-5,000 IU per day, depending on the athlete's geographical location, but 2,000 IU per day is a good starting point.

Melatonin is hormone in the brain that regulates sleep, and sleep is one of the best supplements an athlete can take advantage of. Spending time in front of a computer or sources of blue light significantly depresses levels of melatonin and reduces sleep duration and quality. Melatonin is often packaged with **L-Theanine**, which helps to promote relaxation. Taking 3 mg of melatonin in combination with 200 mg of L-Theanine an hour before bed can significantly help with sleep quality, which has a very large impact on muscle production and overall recovery.

Protein is not really a supplement as it's basically food. However, high-quality sources of protein supplementation are easy to find since many trustworthy companies make great products. As stated before, a decent goal of protein consumption to shoot for is 1 gram per pound of bodyweight. Because athletes will hopefully be consuming a significant amount of protein per day, supplementation of protein derivatives are generally not necessary—

such examples include glutamine and branched chain amino acids (BCAAs). It's important to pick a good source of protein supplementation that is low in carbs and fats—and somewhat low in cholesterol. Dietary cholesterol isn't as dangerous as it was made out to be in the 1980s, but it is indicative of a less efficient “cleaning” process of the whey protein. It's also usually accompanied by a high amount of saturated fat, which again isn't terrible for you, but athletes want to pay for protein, not by-products.