NUTRITION AND PROPER FUELING FOR PERFORMANCE - WHAT YOU NEED TO KNOW AND DON'T KNOW TO ASK.

Protein's Role as a Team Player

Protein has always been a particularly popular nutrient with athletes because of its wide role in building and maintaining muscle. Athletes need to consume a wide variety of high-quality protein foods in their diets. However, while protein is necessary, it is not the primary fuel for working muscles, and consuming more protein than what the body can use is not going to give the athlete larger and stronger muscles. While research shows that protein requirements are higher for athletes to aid in muscle repair and growth, most athletes are already consuming more protein than the body can use. To calculate the amount of protein your body needs on a daily basis take your body weight in pounds and multiply by the appropriate recommendation:

Daily Protein Recommendations

TYPE OF TRAINING	GRAMS OF PROTEIN RECOMMENDED
ENDURANCE	0.54-0.64G PROTEIN PER POUND BODY WEIGHT
STRENGTH (GAIN MUSCLE MASS)	0.72-0.81G PROTEIN PER POUND BODY WEIGHT
STRENGTH (MAINTENANCE)	0.54-0.64G PROTEIN PER POUND BODY WEIGHT
WEIGHT RESTRICTED	0.63-0.81G PROTEIN PER POUND BODY WEIGHT

Protein Content of Commonly Consumed Foods

FOOD	SERVING SIZE	GRAMS OF PROTEIN
CHICKEN BREAST	3OZ	25G
GROUND BEEF	4OZ	24G
BOILED FISH	3OZ	20G
COTTAGE CHEESE	½ CUP	12G
YOGURT (NONFAT)	8OZ	11G
COOKED LENTILS	½ CUP	9G
COOKED BLACK BEANS	½ CUP	8G
MILK (NONFAT)	1 CUP	8G
PEANUT BUTTER	2 TBSP	7G
STRING CHEESE	1OZ	7G
TOFU	½ CUP	7G
EGG	1 LARGE OR 2 EGG WHITES	7G
MIXED NUTS	¼ CUP	5G
COOKED QUINOA	1 CUP	4G
WHOLE WHEAT BREAD	1 SLICE	3G

Building Body Mass

Many athletes want to add more bulk to their bodies in the form of lean muscle. Many supplement products claim to build muscles. Due to the limited regulations of the dietary supplement industry athletes should take special care when considering supplementation. There is a risk of products being contaminated with sport-prohibited or unknown substances with or without the manufacturer knowing. There is no guarantee that the product contents match those listed on the label. Taking a lot of extra protein from either supplements or food does not guarantee bigger muscles. If it did athletes could spend time lounging instead of weight training to build muscles.

A healthier regimen for building muscle would include:

- Following a strength program that challenges muscles
- Adding 500 to 1000 more calories each day to current dietary intake to allow the body to use protein already present in the diet for muscle growth and not be broken down to fuel activity
- Eating foods that are both high in carbs and proteins like grilled chicken sandwiches, peanut butter sandwiches and Greek yogurt with granola
- Choosing low fat sources of both carbohydrates and protein
- Eating several small meals that include about 30 grams of protein throughout the day will support training and muscle building
- Choose lean animal sources of protein (dairy and meats) which are more efficiently absorbed into the body

Protein After Exercise

The body's ability to recover from competition, practices or intense workouts requires adequate rest and proper nutrition. An important component of the recovery process is consuming both carbohydrates and protein shortly after exercise to restore muscle glycogen and stimulate muscle protein synthesis.

Dietary Fat

Fat is the primary fuel for light to moderate intensity exercise. Although fat is a valuable metabolic fuel for muscles during endurance exercise and performs many important functions in the body, not attempt should be made to consume more fat. With that said, some studies have shown athletes that consume high fat diets typically consume fewer calories from carbohydrates. The more efficient an athlete becomes in their sport, the easier it is for them to operate at a lower intensity while maintaining the same level of work or maintaining the same speed (metabolic efficiency).

At this lower intensity stored fat in the muscle can be used as a fuel source. The average 150-pound athlete carries 1,500 to 2,000 calories in the form of carbohydrates but up to 80,000 calories in the form of fat. Fat cannot be used without the presence of carbohydrate, thus for efficient endurance athlete's carbohydrates are still important but stored fat helps them reach the finish line as well.

A research study looked at muscle biopsies of elite rowers who consumed either 40% of their calories from fat or 20% of their calories from fat and compared the power output and speed of the rowers. Some observations below:

- The rowers who consumed the low fat, high carb diet had more muscle glycogen
- The rowers on the high fat, low carb diet had moderate levels of muscle glycogen but were able to complete workout sets
- When it came to power output and faster speeds, the rower's who consumed the low fat, high carb diets had significantly higher power and speed

This has significant implications for athletes in muscular endurance sports that require a burst of power such as swimming to have the energy generated aerobically. It is important to recognize there are many sources of hidden fats in foods. Fat is present but not separately visible in:

- Dairy products such as cheese, whole milk, sour cream and ice cream
- Processed foods such as chips, crackers, granola bars and French fries
- Cooked meats and fish
- Other food sources such as nuts and avocados

Other more obvious sources of fat are in products like margarine, butter, mayonnaise, salad dressing, oils and meats with marbling or visible fat. Athletes should consume 20 to 30 percent of their calories from fat. Aside from decreasing overall calories, limiting consumption of dietary saturated fat is the first step toward losing excess body fat. Doing so eliminates excess calories but not nutrients. Following a low fat, high carb diet is also important for health reasons

because diets high in saturated fat have been associated with cardiovascular disease, obesity, diabetes and some types of cancer.

Substitutions for Reducing Fat Intake

Instead of:	Try:
Whole milk	Skim milk
Cheddar, jack, or swiss cheese	Part skim mozzarella, string or low-fat cottage cheese, other cheeses that contain less than 5g of fat per oz
Ice cream	Ice milk or low-fat/nonfat frozen yogurt, 100% fruit frozen popsicles
Butter or margarine	Jam, yogurt, ricotta cheese, light or nonfat cream cheese, butter substitute, olive oil, hummus
Sour cream	Nonfat plain yogurt, light sour cream, blender whipped cottage cheese dressing
Bacon	Canadian or turkey bacon
Ground beef	Extra lean ground beef or ground turkey (at least 95% lean)
Fried chicken	Baked chicken without the skin
Donuts and pastries	Bagels, whole grain breads, homemade breads, low-fat muffins
Apple pie	Baked or raw apple
Cookies, cakes, or brownies	Vanilla wafers, ginger snaps, graham crackers, fig bars.

**This is part of an informational series to help you or help your athlete get on the right nutritional track. Note that the information to follow is intended for athletes who are working/competing at a high-energy output daily. This information in NOT recommended for the average person who exercises on a purely recreational level.

**All information presented here was compiled by True Sport and the USADA presented and distributed at the 2017 USA Swimming National Select Camp by Alicia Kendig USA swimming and US track and field dietician. The following info can also be found at www.usada.org.