

ACCELERATING RECOVERY FOR CONSISTENT HIGH-VOLUME TRAINING BLOCKS.

“ The macronutrient, Protein, is vital for human survival. Athletes quite often refer to the intake of Protein for recovery and to build muscle. However, this is only two facets of Protein utilization and synthesis.

The many functions of protein covers a multitude of athlete physiology from: 1) Providing the structure of bones, blood, collagen, tendons, ligaments muscles, skin, hair and nails, 2) Providing the backbone function for enzymes, hormones, blood function including hematocrit, hemoglobin, electrolyte balance and modulating your day to day metabolism, and 3) Turnover of proteins, which depends upon your physiological demand and the function and location, proteins (amino acids).

MUSCLE AND TISSUE RESILIENCE

Muscle-tissue Protein Synthesis is determined by 5 key factors:

1. Exercise intensity and volume
2. The type of Protein and assimilation
3. Total lean muscle mass of the athlete
4. Age (Older = higher demand to prevent Sarcopenia),
5. The daily intake (recognizing these four factors)

Muscle Protein Synthesis depends upon total Protein intake per day. However, protein intake enables the body to begin the enzymatic reactions to:

1. Rebuild muscle tissue,
2. Rebuild gut membranes, bone, hormones, blood (specifically Hemoglobin),
3. Branch Chain Amino Acids (BCAAs): expedite recovery, in modulating Human Growth Hormone, Testosterone and Cortisol. This recovery positively affects and negates delayed onset muscle soreness (DOMS) response. BCAAs also reduce elevated liver enzymes.
4. Enhance immune function.

The impact of eccentric muscle contractions (like running), is well published as a factor of muscle damage and delayed muscle soreness.

Whey protein isolate has been studied multiple times in evaluating its effects on resistance training, but only more recently has its role in supporting recovery from aerobic eccentric muscle contraction activities, like endurance running been studied. In 2017, a study looked at post-day Marathon, and 1-week post marathon, blood muscle-damage markers and 1-week post-marathon performance test of elite athletes. Athletes were provided either Whey protein, or a placebo-maltodextrin based formula for 5 weeks of supplementation prior to the marathon and tests. The study showed notably lower muscle-damage blood markers in the Whey group. Performance of the Whey group was consistently superior in the 1-week post marathon performance test.

Endurance distance/duration training and racing, has been shown to trigger leucine/protein (muscle tissue) oxidation, creating a catabolic state of the muscle tissue, if not supported nutritionally. Research is showing, Beta-Hydroxybutyrate (B-HHB) salts, or ketones can offset this oxidation in providing an alternate substrate to oxidize, rather than the oxidation of leucine/muscle tissue.

The effect of intense physical exercise in raising inflammatory oxidative biomarkers and heightened immune responses has been well published. Consistent repetitive insult to muscle tissue has been shown to result in muscle tissue damage. Glutathione is a potent antioxidant produced by the body and can be supported via glutamine and cystine (found in Whey protein).

Studies have shown Glutamine to reduced delayed onset muscle soreness from eccentric exercise, and markers of muscle inflammation.

High intensity endurance training and racing dramatically raises internal temperatures of muscle and Gut-GI tissue. In the case of the Gut tissue, this triggers an ischemic (insufficient/no blood supply) state at the Gut/GI membrane, resulting in membrane integrity breakdown. Left untreated, gut inflammatory substances known as endotoxins will cross the gut-membrane barrier, enter the circulation, then heighten systemic inflammation – most notably in muscle and connective tissues.

One of the key elements of Protein intake post exercise it to elevate L- glutamine and Leucine levels to offset the Lowering of T- Lymphocytes which can heighten the vulnerability for Upper Respiratory Tract Infections. This is a common and unfortunate characteristic of endurance athletes. Prevention and proper Protein intake is paramount to rebound, recover and revitalize your metabolic and immune machinery

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KEY TAKEAWAYS: ACCELERATED RECOVERY – CONSISTENT TRAINING BLOCKS.

1. Consistent endurance training blocks – triggers inflammation and muscle damage
2. Protein consumption is a key macro nutrient necessary for repair of injured and inflamed tissue
3. Oxidation of muscle tissue from exercise, can be averted via exogenous B-HHB ketone substrate supplementation
4. Glutamine reduces biomarkers of muscle inflammation, delayed onset muscle soreness, while ensuring a healthy immune response
5. A healthy mix of quality protein sources should be taken across the day, including meats, whey protein, dairy and seeds.

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SFuels Technical
Development Team

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PRACTICAL PROTEIN NUTRITION INTAKE

Numerous studies have looked at the window of opportunity to optimize fueling post exercise. Our recommendation considering the benefits of Protein intake and to potentially negate the immediate opportunity to synthesize protein, is to begin intake within 30 - 60 minutes after exercise.

On a LCHF or KETO nutritional daily plan the Protein intake should be based on the 5 factors noted. However, LCHF/KETO preserves the key building blocks for Protein synthesis - the Branched Chain Amino Acids. Circulating levels of BCAA's allow a preservation of loss of muscle mass. This is important to recognize the merits of higher BCAA levels during hard HIIT sessions or racing.

What is the optimal intake for an endurance athlete to allow maximal output and recovery? Here are some practical guidelines for optimization:

1. **Protein intake/ day is based on total **body lean mass**.**
2. **Total Protein intake ranges between 1.2 - 1.8 grams / kg (lean body mass) /day.** (Pounds to Kg: Divide your weight by 2.2).
3. **The portion of Protein can be divided into 3 - 5 daily feedings.** Regarding intake post exercise and total Daily Protein Intake, the Anabolic effect of Protein should be spread out during the day - depending upon your ~3 meals and exercise sessions.
 - a) Take your **lean body mass weight**, multiply it by the **ranges** noted above.
 - b) **For HIIT sessions, longer workouts and multiple workouts in one day,** the higher range from 1.5 - 1.8 grams/ kg / day should be consumed.
 - c) For easier workouts/recovery days, ingest lower 1.2 - 1.4 grams/ kg/ day.

Example Case

*Double session workout of 3Hours total-training time,
with a 60 kg athlete (lean body mass) x 1.8 grams of Protein = 108 grams Protein per day.*

Looking at this example and recognizing the need to fuel post exercise the recommended percentages are as follows:

Breakfast:(this depends upon the workout intensity and length) Using SFuels Train for the first 30 - 60 minutes allows the body to tap into Glut - 4 transporter and utilizes "stored energy". Morning fueling is vital for these double session training days.

At four protein intakes across the day, this would equate to 25% Protein across Breakfast/ Lunch/ Dinner/ Post Exercise.

*So, to the example above
108 grams divided by 4 = 27 grams Protein / per intake-meal.*

Fueling for optimal performance is quite often a fine balance of maintaining energy output without overloading the GI tract. Generally smaller servings are ideal before any exercise session and or allowing 2 hour window post meal before embarking on your workout.

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Supplement Facts

Serving Size 36g (1 Scoop)
Servings Per Container About 25

	Amount Per Serving	%DV**
Calories	90	
Total Fat	1g	1%
Saturated Fat	1g	5%
Sodium (from Sodium Beta-hydroxybutyrate)	1220mg	53%
Total Carbohydrates	2g	1%
Dietary Fiber	1g	4%
Total Sugars	<1g	
Protein	19g	
Calcium	120mg	10%
Iron	1.1mg	6%
Potassium (from Potassium Gluconate)	70mg	2%
L-Glutamine	5g	†
Sodium BHB (Beta-hydroxybutyrate)	6g	†

**Percent Daily Values (%DV) are based on a 2,000 calorie diet.
†Daily Value (DV) not established.



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TEXTURE

Creamy-shake like

MIX WITH

Cold water, Cream or Milk

SWEETNESS

Mild

FLAVORS

Chocolate-Cocoa

Reducing leucine (protein) muscle oxidation, from high volume endurance exercise by raising levels of B- hydroxybutyrate (BHB) ketones.

Improve muscle-torque (power), lower delayed onset muscle soreness and inflammation, through high dose L-Glutamine supplementation. Reduce, exercise heat-triggered damage to the gut membrane, by rapid membrane repair, through L-Glutamine.

Replenish lowered sodium levels, commonly seen in low-carb endurance athletes.

Using highest quality whey protein isolate, to improve lean-body mass, to reduce the damaging effects of high-volume eccentric muscle contractions (running, cycling etc.) resulting in a decline of muscle strength and possible micro-tear muscle damage.

Whey protein has also been highlighted for improving immune response, and blunting cortisol responses from training stress.

Eliminating sugar triggered insulin spikes, stalled fat-oxidation and heightened inflammatory markers through avoiding the use of sucrose, glucose, fructose, maltodextrins.

Maintain favorable gut bacteria, by avoiding the use of all sugar alcohols like sucralose, that have shown to disrupt the gut microbiome.



SUGGESTED USAGE

Drink SFuels REVIVAL within 30minutes of exercise, workouts. Add 1-2 scoops to 16oz of cold water, or to 14oz cold water and 10oz of crème or your dairy-milk choice.

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