

# WORKOUT NUTRITION

Every athlete has heard that there is a “30 minute” window to maximize the effectiveness of post-workout nutrition. In this article, we are going to explore the most recent sport science research regarding pre and post-workout nutrition. Furthermore the workout nutrition needs for strength/power and sprint athletes will be addressed. A future article will cover the unique nutritional concerns for endurance athletes.



## THE “OLD” RECOMMENDATIONS

In 1998, a company called PacificHealth Laboratories produced their patented recovery drink known as *Endurox-R4*. They based the formulation on research published at that time showing that a 4:1 ratio of carbohydrate to protein consumed within 30 minutes of exercise completion resulted in increased muscle glycogen stores (a measure of stored carbohydrate). For some time following the introduction of *Endurox-R4*, exercise physiologists studied the effects of different combinations of carbohydrate, protein, and electrolytes to try to find a ratio that would hasten recovery from intense exercise. This led many sport scientists to conclude that a 4:1 ratio of carbohydrate to protein, consumed after exercise was the best method for improving recovery - when recovery is defined as replenishing carbohydrate stores..

## OUT WITH THE OLD, IN WITH THE NEW

More recent research has shown that different ratios of carbohydrate to protein work as well as the patented 4:1 ratio to restore carbohydrate to pre-exercise levels (2). Furthermore, recovery from intense exercise entails more than just restoring energy reserves; promoting protein synthesis (muscle growth and repair) is equally important. When protein synthesis is the primary concern, research has demonstrated that consuming free-form amino acids before workout results in reduced markers of muscular damage and increased protein synthesis - something that post-exercise carbohydrate and protein mixtures have mixed results with (3)(6). With all of this new information, some in conflict with what was already “known” how does an athlete make a sensible choice for workout nutrition?

## STRENGTH AND POWER ATHLETES

Although training for strength and power sports like Power Lifting or Olympic Lifting are highly anaerobic and tax the body's glycogen reserves to some extent, the main focus for athletes performing low repetition high load resistance training is repairing muscle damage. Athletes who participate in these explosive events should focus their workout nutrition on supplying the body with nutrients needed to repair muscles while supplying adequate carbohydrate to replenish glycogen stores.

Research has shown that consuming 6g of an EAA blend along with 30g of simple carbohydrates pre-workout dramatically increases the uptake and incorporation of amino acids into the muscles during and after a workout (5).

Post-workout, strength and power athletes should consume a meal or supplement that contains a combination of protein and carbohydrate. The effects of combining protein and carbohydrate on muscle repair can be seen in the table on the right (8).

For athletes over the age of 50, 1.5g of the Branched Chain Amino Acid - Leucine should also be incorporated into the post-workout drink to help stimulate the muscular tissue repair process (6). Research has shown that Leucine is anabolic (increases muscle protein synthesis) and reduces markers of muscle damage in weight training athletes (7).

- **Pre-workout:** consume 6g of EAA along with 30g of simple carbohydrate
- Post-workout: consume a combination of protein and carbohydrate, preferably in liquid form
- Consider adding additional Leucine pre or post-workout

## SPRINT ATHLETES

Sprint athletes include all athletes who compete in dynamic events that last from 9 seconds to 3 minutes. There are two main focuses for sprint athletes; replenishing muscle glycogen stores to improve subsequent training bouts and preserving muscle mass.

In order to rapidly resupply carbohydrate stores, 0.70g/kg of body weight of simple carbohydrate should be consumed immediately post-workout (8). Research has demonstrated that this level of post-workout carbohydrate consumption results in maximal muscle glycogen resynthesis. Practically, this translates to 50-60g of simple carbohydrate for a 170lb athlete. Research also indicates that the type of carbohydrate has an impact on the rate of carbohydrate recovery with glucose and sucrose superior to fructose (8).

Further evidence shows that combining carbohydrate with protein optimizes carbohydrate stores and provides amino acids to enhance muscular recovery (8). As a guideline, try to consume a 4:1 ratio of carbohydrate to protein to optimize carbohydrate stores. This would be about 13-15g of protein for a 170lb athlete.

In order to preserve muscle mass, sprint athletes should follow the same pre-workout protocol as strength and power athletes. Consuming EAA's combined with carbohydrate acts to protect the muscle from being broken down during intense training.

- **Pre-workout:** consume 6g of EAA along with 30g of simple carbohydrate
- **Post-workout:** consume an approximate 4:1 ratio of carbohydrate to protein, meeting the 0.70g/kg carbohydrate recommendation

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