When it comes to supplements, there are certain guidelines that should be followed. For instance, it is recommended to not take a supplement in order to attain a goal if simply working harder can result in attaining the goal. Instead of using a supplement to help with an activity, it may be best to use a supplement to aid in the recovery process afterwards. Beta-hydroxy beta-methylbutyrate (HMB) and leucine are relatively safe supplements that may have beneficial uses for tactical athletes.

**HMB AND LEUCINE**

HMB is a metabolite of the amino acid leucine (2,6). Leucine is one of the three branched-chain amino acids (BCAA), along with valine and isoleucine. Leucine plays a role in muscle recovery and muscle protein synthesis (2). During exercise, leucine breaks down, resulting in increased levels of HMB. A common theory is that taking HMB will send a message to the body to breakdown less muscle (2). HMB is considered “anti-catabolic,” so it may help prevent muscle protein breakdown and cellular damage associated with high-intensity exercise (2,10). This may also be of added benefit for individuals who are injured and going through rehabilitation. Anabolic is markedly different from anti-catabolic; anabolic infers that it stimulates growth, whereas, anti-catabolic infers that it prevents breakdown. Results of studies using HMB and leucine are mixed (2,3,10). As with any supplement, the benefit of the supplement largely depends on the training state of the individual.

**HOW MUCH?**

The recommended amount of BCAA per day for a healthy adult is 144 mg/kg, which equates to 72 mg/kg of leucine (1). For instance, an 80-kg (176 lb) individual would need 5,760 mg (5.76 g) per day based on this recommendation. A therapeutic dose is 180 mg/kg divided into three doses per day (4). This comes to 14.4 g with each dose being about 5 g of leucine. The recommended dose of HMB is 3 g per day (2,9,10). Only 5% of leucine converts to HMB (10). So the recommended dose of 14 g of leucine a day provides just 0.7 g of HMB. In order to get 3 g of HMB, one would require 60 g of leucine. The safe upper limit is 35 g a day, more than that may result in liver damage, brain damage from excess ammonia, and is essentially a waste of money (1,5).

Prior to supplementing leucine, or any nutrient, it is important to have a professional—such as a Registered Dietitian—assess the content of the current diet. Individuals consuming a higher protein diet (1.5 g/kg, which would be 120 g for an 80-kg individual) may not need to supplement the entire recommended amount of leucine. A diet containing 120 g of protein made up of milk, cottage cheese, eggs, salmon, or another lean meat should contain about 10 g of leucine. So, to get a therapeutic dose of 14.4 g, the individual would only need to supplement an additional 4 – 5 g.

Additionally, whey protein (food or supplements) typically contains 25% BCAA and about 40% of the BCAA is leucine (8). One scoop of a typical 100% whey protein powder contains about 26 g of protein and 6.5 g of BCAA, with 2.5 g being leucine (8). Unlike leucine, free form HMB is not found in a lot of foods. Leucine must convert to HMB. HMB is most abundantly found in catfish and citrus fruits, so supplementing may be required to get the recommended 3 g per day (3).

**RISKS OF SUPPLEMENTATION**

One major risk of supplementation of HMB or leucine that it is not always clear if the product is clean or if it has been mixed up in a proprietary blend, thereby making exact doses impossible to determine. Additionally, some supplements have been found to contain ingredients such as stimulants and steroids that are not disclosed on the label (4). Utilizing reliable resources, such as NSFSport.com and Informed-Choice.org, is a good starting place.

Oftentimes it is difficult to locate single ingredient HMB products on the market that have been third party certified as this would be the most ideal supplement. For example, Abbott, the maker of Ensure® and EAS® products, was one of the first to use HMB in their protein drinks such as Ensure and Myoplex®, and they own the “NutriVigor” product, which contains 1.5 g of HMB. This company also makes a line of protein called “Muscle Armor” that contains HMB. Since all of their products are third party certified the risk of supplement contamination or mislabeling is fairly low. As with many other products on the market, these just contain HMB and are not single-ingredient HMB supplements. While these products are helpful, HMB must be consumed daily for at least 3 – 4 weeks before any results can be realized (2,10). Consuming two of these products each day to get 3 g (most have 1.5 g of HMB per serving) may be expensive or inconvenient. An option might be to compliment it with a single-ingredient HMB product to get the recommended 3 g per day. The 3 g are best absorbed in 2 – 3 separate doses around workout time and since amino acids are best absorbed with protein, it would be recommended to take these doses with a protein source (10).
CONCLUSION
No supplement will help a tactical athlete that does not train consistently, get adequate rest, or hydrate and fuel properly. Supplements should enhance an effective training plan and diet, not replace it. Eating a diet rich in leucine and supplementing HMB may be beneficial for tactical athletes as long as they are following the recommended guidelines.

REFERENCES

ABOUT THE AUTHOR
Trisha Stavinoha’s United States Army and dietetic career began in 1998 after earning her Bachelor of Science degree in Nutrition from Texas State University and being accepted into the United States Army’s dietetic internship program. Stavinoha earned her Master of Science degree in Sport Nutrition from Long Island University while concurrently competing on their track and field and cross-country teams. She has been a credentialed sport dietitian and strength and conditioning coach since 2008. Her credibility in sport nutrition comes from being a soldier, scholar, and athlete. Stavinoha’s experience with athletes includes a wide range of Olympic hopefuls in the Army’s esteemed World Class Athlete Program, high school and collegiate cross country runners, triathlon and endurance athletes, tactical soldiers, Wounded Warriors, and overweight service members trying to pass body fat and physical fitness standards.