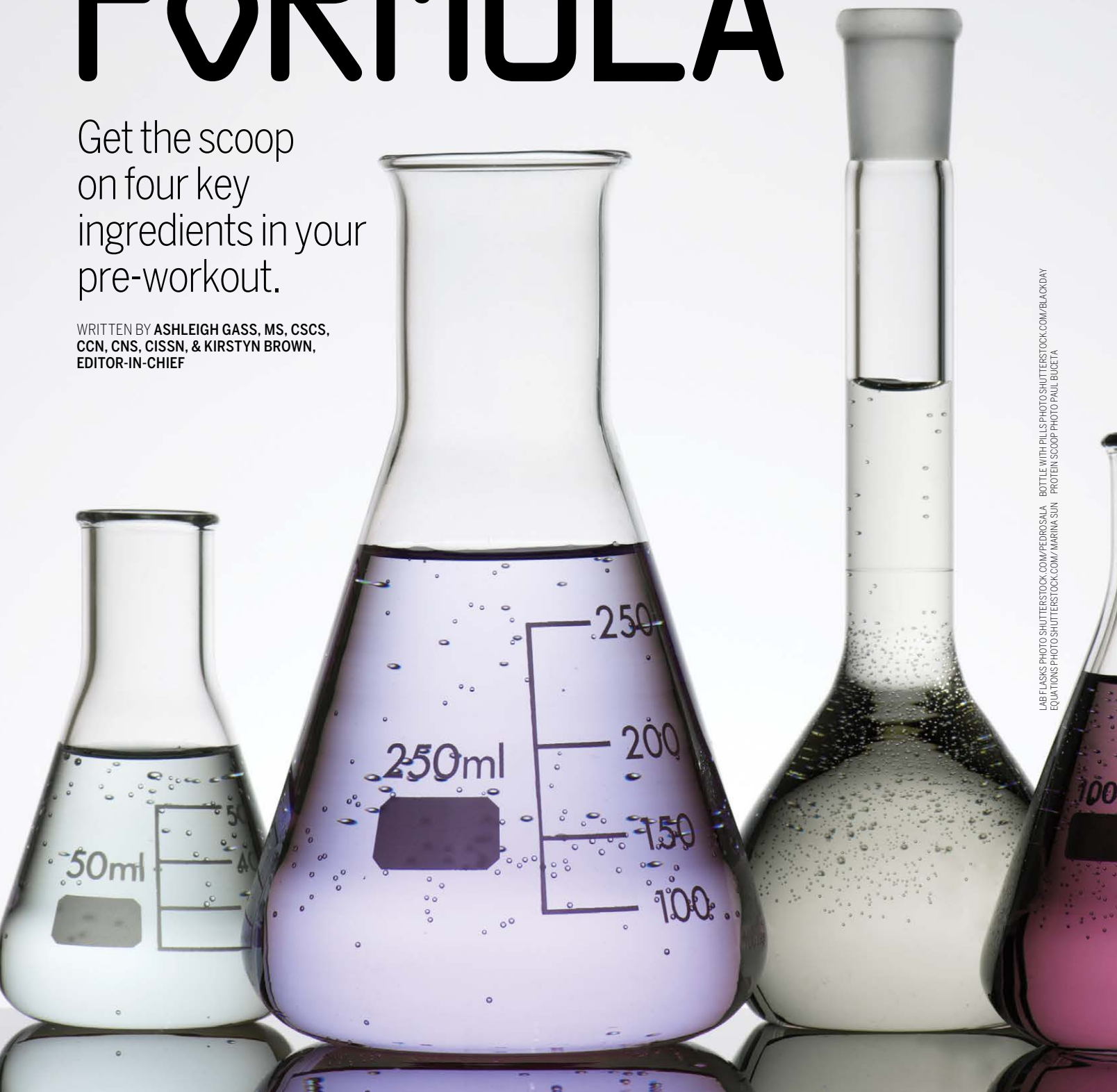


Find Your FORMULA

Get the scoop on four key ingredients in your pre-workout.

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HOW DO YOU GET PUMPED UP FOR A GOOD WORKOUT?

Do you throw some high-energy tracks on your playlist and blast it on your drive to the gym? Or do you watch the latest viral fitspo video circulating the internet? Or are you like a growing population of fitness buffs that turn to a pre-workout formula to help get you through the grind?

Pre-workout supplements are seemingly everywhere these days, not just in your local supplement shop but also in health food stores and even some supermarkets. These fruity flavored mixtures of amino acids, vitamins, carbohydrates, and stimulants have gained traction among athletic and bodybuilding crowds due to their purported ergogenic benefits (meaning they enhance physical performance, stamina, and recovery). But do they really work? Or are they just glorified energy drinks?

At the moment, the answer is somewhat inconclusive; scientific research on the safety and effectiveness of the formulas themselves is still a bit limited. However, many of the key ingredients found in most pre-workout drinks have been studied individually. In some cases, such as when creatine is included, research suggests they have merit, showing that they can help improve energy, alertness, strength, and power during a grueling workout. For others, the findings are less consistent or reliable. But which supps can deliver a better training session, and which might fall short of their promises?

Those profiled here are just the tip of the iceberg when it comes to common ingredients found in your favorite pre-workout formulas, but are good ones to have on your radar when you're combing the shelves for a pre-workout rush.

Caffeine

Caffeine is one of the most familiar ingredients in these formulations, likely because it's one of the most well-researched and commonly used stimulants out there. When consumed 30-60 minutes prior to exercise, it's been shown to improve performance in endurance events and time-trials, and delay the onset of fatigue during exhaustive exercise and improve cognitive function and alertness. A recent study published in the *Journal of International Society of Sports Nutrition* reported caffeine possesses glycogen-sparing effects (meaning, carbohydrates aren't used as quickly, so you'll have more energy, longer). This could mean improved endurance and may lead to positive changes in body composition.

TAKE HOME POINTS: Ingesting caffeine prior to training can allow you to train harder, for a longer period of time, and potentially stay more alert. It's effective in low to moderate doses of about 3-6 mg per kilogram of bodyweight, which for a 65 kg female (about 140 lbs) is about 195-390 mg. For an easy point of reference, an 8oz cup of coffee contains anywhere from 95-200 mg of caffeine.

Beta-Alanine

In scientific terms, this amino acid serves as a rate-limiting precursor to carnosine in skeletal muscle. In other words, the amount of beta-alanine available determines how much carnosine your body produces. Why is carnosine important? Because it serves as a muscle buffer during intense exercise, protecting the muscle pH from lowering too far, and shutting down exercise capacity. Therefore, the greater the carnosine stores you have thanks to beta-alanine supplementation, the greater the buffering capacity, helping you crank out a few extra lunges.

A study published in the *Journal of Applied Physiology* found that beta-alanine improved the rate of fatigue in sprinters, in addition to increas-



ing the number of reps to failure and overall work capacity in weight lifters. To top it off, beta-alanine has been shown to help delay the onset of neuromuscular fatigue—or a decrease of power—during sub-maximal cycling, and may increase time to exhaustion in women.

TAKE HOME POINT: Research shows beta-alanine definitely has potential in pre-workout supplementation. Common dosages range from 1-2 g daily before or during training sessions.

Creatine

Creatine comes up in all kinds of conversations around sports nutrition, and it plays specific roles in pre-workout blends. Creatine is a star player in pre-workouts due to its ability to rapidly replenish a certain type of energy store known as Adenosine Triphosphate, or ATP. This allows for quicker recovery, which means a potential increase in training volume. This is great news for any avid trainer, particularly competitive athletes who undergo increases in training volume leading up to major events. What's more, this mighty supplement may also help you get closer to your strength gains and fat loss goals; a 2012 report in the *Journal of the International Society of Sports Nutrition* stated that creatine "has been shown to increase strength and improve body composition in most individuals when combined with exercise." Combine these performance-based findings with the fact that creatine is also the most extensively studied ergogenic aids on the market, and you've got a winning ingredient. ▶

TAKE HOME POINT: If you're considering trying out a pre-workout, look for one that has creatine as a main ingredient, or try it on its own as a stand-alone supplement. It can be used in doses of 2-3 g per day to slowly increase stores in muscles, or, it can be loaded at 0.3 g per kilogram of bodyweight per day for several days, followed by maintenance doses of 3-5 g per day.

Betaine

This amino acid may not have the same cachet as creatine, but is frequently found among key ingredients in pre-workout formulas. Otherwise known as Trimethylglycine, or TMG, sources have touted betaine as an amino acid capable of boosting muscle strength and power, and increasing work capacity. The research on this, unfortunately, isn't as strong as some of the other players mentioned. While one study reported significant increases in total repetitions in a 10-set bench press protocol, other studies looking at power output have found nothing of significance.

But perhaps it's worth mentioning that betaine is also known to have cardiovascular benefits, due to its ability to lower homocysteine levels, a biomarker of cardiovascular complications. At dosages as high as 3 g per day or more, betaine has been shown to be effective in reducing homocysteine concentrations. But again, from a performance standpoint, it's still difficult to determine how betaine stacks up.

TAKE HOME POINT: Currently, it seems that more performance-based research is needed to determine if betaine is a big hitter as a sports supplement. While it doesn't appear to be as beneficial for pre-workout purposes as caffeine and creatine, it also doesn't seem to pose any harmful side effects, and may even provide some benefits to your ticker.

How to Choose the Right One

1. Shop at a credible supplement/nutrition store with knowledgeable employees. Ask a clerk for some recommendations based on your goals and needs.
2. Look for high quality, effective ingredients, like the ones outlined here, and watch for fillers and weird ingredients.
3. Stick with reputable brands. If you're unsure, do some research before buying.
4. If you're still confused, make your own by blending the following ingredients:

Coffee or green tea
(150-200 mg caffeine)
1-2 g beta-alanine
2 g creatine
5 g Branched Chain Amino Acids (BCAAs)
Ice cubes
1-2 tsp honey (optional)

BUYING A
PRE-WORKOUT?
FIRST, DO
YOUR HOMEWORK.

WHO SHOULD NOT TAKE PRE-WORKOUTS

Think before you sip if any of the following describes you:

1. YOU CAN'T HANDLE CAFFEINE.

Straight up, if you're highly caffeine sensitive, pre-workout supplements containing caffeine aren't for you. Likewise, if you're currently undergoing an "adrenal reset" nutritional program, or are a highly anxious or stressed individual, the last thing your body needs are stimulants.

2. YOU'RE EXPECTING. If you're pregnant or lactating, don't take them. Period.

3. YOU HAVE A HEART CONDITION.

If you have any doubt about your cardiovascular health, get cleared by your doc before starting a supplement program.

4. YOU'RE GOING TO YOGA.

Low-intensity workouts don't require a pre-workout supplement. Same goes for short-duration workouts (like a quick get in, get out circuit). If you need a boost, try a banana or shot of espresso instead. **B**

