Gatorade Sports Science Institute

GSSI Sports Science News

At the Gatorade Sports Science Institute, we have long been looking for ways to help professionals and athletes understand the dangers of ephedra. Now that the Food and Drug Administration has banned the substance, we'd like to help you navigate what's quickly become a new buzzword in the sports nutrition and supplement industries: ephedra-free.

Many manufacturers are now using alternative ingredients, some of which may present risks of their own. Just because ephedra is no longer listed on the label doesn't mean the supplement is safe. Reputable companies follow stringent manufacturing practices to assure that their products are free from potentially harmful ingredients and contaminants. This is certainly true for Gatorade products.

In this article, Susan Kundrat, M.S., R.D., L.D., the sports nutrition consultant for the Northwestern University Wildcats in Evanston, Ill., takes a closer look at these potentially dangerous substances.

We hope you find this information useful.

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# How Safe Are Ephedra-Free Supplements?

Susan Kundrat, M.S., R.D., L.D.


- Ephedra-free doesn't mean danger-free
- Ephedra-free ingredients
- Combine with caution: Mixing stimulants can be fatal
- Conclusion
- Contact Us
- www.gssiweb.com

The Food and Drug Administration rang in the New Year with a ban on the controversial supplement ephedra. Spurred by the death of Baltimore Orioles pitcher Steve Bechler and the rising concerns of health professionals, the agency made the sale of products containing the dangerous substance illegal.

Yet, as millions of athletes continue to look for the competitive edge, what are the "ephedra-free" alternatives? What's in them? How are they being marketed? And, more importantly, what should you know about them? Here's a brief recap.

## Ephedra-free doesn't mean danger-free

Not long ago, a colleague showed me a new product being marketed as an ephedra-free dietary supplement specifically for athletes. Press materials claimed the product complied with National Collegiate Athletic Association (NCAA) guidelines.

A closer look at the ingredients, however, revealed a compound called Citrus Aurantium (also known as Bitter Orange). This compound is similar to ephedrine, which is banned by the NCAA and the International Olympic Committee (IOC) and pseudoephedrine, which is banned by the IOC.* Yet, it is doubtful most athletes would make this connection.

* The IOC identifies a positive test for pseudoephedrine as a concentration in urine greater than 25 micrograms per milliliter.

Unfortunately this scenario is all too familiar, adding to the already growing concern that some ephedra-free products may be as harmful as those that actually contain the substance.

Back to Top

## Ephedra-free ingredients

While athletes continue to seek a competitive advantage via supplements, sports health professionals must know and educate players about the risks associated with ephedra-free products. After all, in light of the FDA's recent actions, they're bound to proliferate in an already flooded market.

Still, many of the purported uses of these supplements lack solid research. Some supplements have the potential to interact poorly with certain medications and foods to produce potentially dangerous side effects. To help you help your athletes navigate the options during training and competition, here is a list of ingredients and effects to watch out for:[1]

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Ephedra-Free Supplements Chart

| Name | Also Known As ... | Purported Uses | Effects |
|---|---|---|---|
| Bitter Orange | Green Orange, Kitjitsu, Citrus Aurantium | - Appetite suppressant and weight loss<br>- Gastrointestinal disorders | - Bitter orange fruit, peel and juice contain the stimulant synephrine<br>- May increase blood pressure |
| Black or Green Tea | Black Leaf Tea, English Tea, Chinese Tea, EGCG, Japanese Tea | - Improve cognitive performance<br>- Reduce risk of cardiac disease, certain cancers and treat other common ailments | - Contains caffeine. Consumption of more than 300 mg caffeine (or the equivalent of three or four 8-ounce cups of coffee) has been associated with adverse affects such as increased heart rate, headache and insomnia |
| Chromium | Chromium Picolinate, Chromium 3, Cr3+, Glucose Tolerance Factor | - Weight loss<br>- Increase muscle mass and decrease body fat<br>- Improve glycemic control in type 1 and 2 diabetes | - Although studies have found some effectiveness with diabetes, the research for affecting body composition is not consistent |
| Cola Nut | Bissy Nut, Cola, Guru Nut, Kola Nut | - Short-term relief of mental and physical fatigue and depressive states<br>- Migraines | - Possibly unsafe when used in excessive amounts due to its caffeine content and stimulation of the central nervous system |
| Dill Weed Extract | American Dill, Dill Herb, Dillweed, Dilly, European Dill | - Diseases and disorders of the gastrointestinal tract, kidney and urinary tract | - There is insufficient reliable information available about its effectiveness |
| DMAE | 2-Dimethyl Aminoethanol, Deanol | - Enhance memory and mood<br>- Increase energy and improve athletic performance | - Side effects may include headache, drowsiness, insomnia and depression |

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|---|---|---|---|
| Ginseng | American Ginseng, Panax Ginseng | - Increase energy<br>- Stimulate immune function<br>- Enhance athletic performance | - Well-designed studies have not confirmed benefit to athletic performance<br>- Use with caffeine-containing substances may enhance adverse central nervous system effects |
| Glucomannan | Konjac | - Weight loss<br>- Blood glucose control<br>- Reduce cholesterol<br>- Constipation | - Some studies demonstrate that glucomannan is possibly effective for these concerns, but it may interfere with common medications used to treat these conditions |
| Gotu Kola | Brahmi, Centella, Hydrocotyle, White Rot | - Reduce fatigue and edema<br>- Improve memory | - May cause gastrointestinal upset, nausea, pruritus and hypersensitivity<br>- Large doses might increase blood pressure, glucose and cholesterol levels |
| Guarana | Brazilian Cocoa, Paullinia, Zoom | - Weight loss<br>- Enhance athletic performance<br>- Reduce fatigue | - Contains caffeine and is likely ineffective when used orally for improving short-term, high-intensity performance, anaerobic capacity, or power |
| Kava Kava | Ava, Gi, Kawa, Intoxicating Pepper | - Reduce stress<br>- Anxiety and depression<br>- ADHD | - May be effective for short-term anxiety<br>- Safety concerns, especially with liver toxicity |
| L-Carnitine | Vitamin B(t), Carnitine, D-Carnitine | - Enhance athletic performance | - There is insufficient evidence for use as a performance-enhancer |
| Mate | Yerba Mate, Jesuit's Tea, Hervea | - Relieve mental and physical fatigue<br>- Diuretic<br>- Weight control | - Can cause insomnia, nervousness, restlessness or other caffeine-related side effects |

| | | | |
|---|---|---|---|
| Tyrosine | L-Tyrosine, Tyr, Tyrosinum | - Improve alertness following sleep deprivation<br>- Depression<br>- Phenylketonuria (PKU)<br>- ADD/ADHD<br>- Premenstrual syndrome (PMS) | - Seems to be safe when used in doses up to 150 mg/kg per day for up to three months. May decrease the effectiveness of the medication Levodopa, or have added effects when taken with thyroid hormone medications |
| Willow Bark | Basket Willow, Purple Osier, Silberweide, White Willow | - Mild colds and infections<br>- Headaches<br>- Pain<br>- Inflammation<br>- Arthritis<br>- Gout | - Salicylates in willow bark provide its aspirin-like effects<br>- May increase clotting time and have similar negative side effects as aspirin |

Back to Top

## Combine with caution: Mixing stimulants can be fatal

Manufacturers of ephedra-free products also commonly combine stimulants with aspirin-like substances in an attempt to mimic the "ECA Stack" (i.e., blend of ephedrine, caffeine and aspirin). But that can be risky. Some products contain more than the recommended limit of 300 mg of caffeine per serving. And, in some cases, more than three times that amount is suggested throughout the day.

| Deadly Combinations | Aspirin-like effects | Caffeine-like effects | Ephedrine-like effects |
|---|---|---|---|
| Combination #1 | Willow Bark | Green Tea, Guarana | |
| Combination #2 | | Green Tea, Yerba Mate | Bitter Orange |
| Combination #3 | | Yerba Mate, Caffeine, Guarana, Green Tea, Kola Nut | |
| Combination #4 | Willow Bark | Green Tea, Caffeine, Guarana | |
| Combination #5 | Willow Bark | Green Tea | Bitter Orange |

## Conclusion

With the plethora of new “ephedra-free” supplements on the market, athletes will no doubt be interested in using them in misguided attempts to improve performance. As responsible professionals, we can help athletes understand the pros and cons of taking “ephedra-free” supplements and be a resource for providing accurate and up-to-date information.

Back to Top



## Talking Points: How to educate your athletes on “ephedra-free”

• Reinforce the fact that dietary supplements are not regulated. Some manufacturers may use potentially unsafe ingredients and make inaccurate claims on labels.

• Explain the lack of consistency in products. You can cite a recent study from the University of Minnesota in which researchers found that, of 92 Echinacea products reviewed, two-thirds did not meet expectations for recommended dosages and ingredients listed.[2]

• Help athletes understand that “ephedra-free” may still contain banned ingredients, no matter how the products are marketed. This puts players at risk for being noncompliant with NCAA rules and other important guidelines.

• Educate athletes on risky combinations, contraindications and potential side effects.

Back to Top

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References:
[1] Natural Medicines Comprehensive Database: www.naturaldatabase.com
[2] Archives of Internal Medicine, 2003;163:2290-2295

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