

## The Scoop On Energy Drinks

Energy (or, more appropriately, stimulant) drinks are beverages promoted with the promise of delivering a burst of energy when consumed. Many brands contain a list of ingredients touted as “natural,” including herbal supplements, vitamins, and amino acids. The mainstay of all energy drinks, however, is caffeine – usually in higher amounts than in traditional sodas. Energy drinks also often contain high levels of sugar, though some artificially sweetened versions exist. But it’s the so-called “natural” ingredients that may appeal to people seeking a healthy energy kick.

Let’s examine the five ingredients most commonly found in energy drinks: caffeine, guarana, ginseng, taurine, and carnitine.

### Caffeine

Caffeine is one of the most frequently used psychoactive substances in the world. Individual responses to caffeine vary widely and also depend on the amount that is routinely consumed. Therefore, it is difficult to link precise caffeine intake levels to specific health effects. For example, in a healthy adult, a small amount of caffeine may have positive effects, such as increased alertness or ability to concentrate. However, some people are more sensitive. For them, a small amount of caffeine could cause insomnia, headaches, anxiety, rapid heartbeat, increased blood pressure, irritability, indigestion, and nervousness. This is a particular concern for children whose intake of caffeine varies more than in adults. In a survey of caffeine intake among seventh, eighth, and ninth graders, researchers found that children with higher caffeine intake had more sleep disturbances, including shorter nighttime sleep duration, increased wake time after sleep onset, and increased daytime sleep. Like adults, children can also experience withdrawal symptoms following caffeine exposure. Such symptoms can include irritability, anxiety, fatigue, and headache. Moreover, a study examining the effects of caffeine withdrawal in children found that there was a significant reduction in performance on reaction time for tasks requiring attention. This deterioration in performance appeared to persist up to one week after halting caffeine intake. Lastly, caffeine is a diuretic that promotes fluid loss. Hence, **caution should be used when drinking caffeinated beverages while exercising.** The combination of fluid loss from sweating during exercise and caffeine intake can increase the risk of dehydration. This risk may be greater in children, who may be more sensitive to the physiologic effects of caffeine than adults (as well as more vulnerable to dehydration). Here it is important to note the difference between energy drinks and sports or re-hydrating beverages. The latter are designed to restore fluid balance and provide energy for use during exercise, but they do not contain caffeine.

### Guarana

Guarana is a plant that grows in the northern parts of Brazil and Venezuela, and whose seeds are crushed to produce an herbal extract used by the indigenous tribes of the Amazon. Its associated effects include weight loss, pain relief, memory enhancement, and antimicrobial activity. Guarana contains caffeine, theobromine, theophylline, tannins, and trace amounts of timbonine. Its main stimulant effect is due to its caffeine content. 1 gram of guarana contains as much caffeine as a medium-strength cup of coffee. However, guarana has been reported to have a more prolonged effect than the same dose of caffeine alone due to the mixture of tannins with caffeine found in guarana. There are very limited studies of the health effects of guarana. A double-blind, placebo-controlled study demonstrated that guarana improved memory performance, alertness, and mood ratings in adults. There have been no studies examining the safety and efficacy of guarana in children.

### Ginseng

Derived from the plant *Panax ginseng*, Asian ginseng has been used as an herbal remedy in China for thousands of years. Traditionally, it has been said to improve the body’s endurance under stress, aid recovery from illness, and increase physical and mental performance. A comprehensive review of 16 double-blind, randomized controlled trials of ginseng root extract found no conclusive evidence that ginseng improves physical performance, stimulates the immune system, or enhances psychological well-being or resistance to stress. Among the reported adverse effects: stomach upset, high blood pressure, insomnia, headaches, breast tenderness, vaginal bleeding, and heart rhythm disturbances. Unfortunately, none of the

clinical trials examined the safety or efficacy of ginseng in children or adolescents. This lack of information has not deterred manufacturers from incorporating varying forms and dosages of ginseng within energy drinks.

## **Taurine**

Taurine is usually synthesized in the body and is also obtained from red meat and fish. It is considered essential for normal development of infants and hence, frequently added to infant formula. Dietary taurine supplementation in humans greater than 1 year of age is much less well studied.

## **Carnitine**

Carnitine is synthesized within the body and plays an important role in muscle bioenergetics. However, there is no evidence to suggest that carnitine supplementation actually does improve exercise performance in healthy subjects. Carnitine supplementation does not increase the concentration of carnitine in muscle, and it has not been shown to improve performance in repeated bouts of high-intensity aerobic exercise such as swimming. Though there is no evidence that high doses of carnitine produce any serious toxicity, a beneficial role of carnitine supplementation has not been demonstrated.

<b><u>BEVERAGE</u></b>	<b><u>SIZE (OZ)</u></b>	<b><u>CAFFEINE CONTENT (MG)</u></b>
<b>Energy Drinks</b>		
Red Bull	8.3	80
Rockstar	16	150
Full Throttle	16	141
Monster	16	140
SoBe NoFear	16	166
Cocaine Energy Drink	8.4	280 (recently withdrawn from stores)
<b>Soda</b>		
Coca-Cola Classic	12	34
Diet Coke	12	45
Pepsi-Cola	12	38
Diet Pepsi-Cola	12	36
Sunkist Orange Soda	12	41
<b>Coffee</b>		
Brewed	8	107.5
Drip	8	145
Starbucks Tall Caffè Americano	12	116
Starbucks Tall Caffè Latte/Mocha/Cappuccino	12	58
Starbucks Tall Coffee	12	279
<b>Tea</b>		
Brewed, US brands	8	30
Iced	8	47
Green	8	15

	Amount	Calories	Sugars	Guarana	Taurine	Carnitine	Ginseng
<b>Red Bull</b>	8.3 oz	110	27 grams	None	No amt given	None	None
<b>Rockstar</b>	16 oz	220	54 grams	400 mg	1,892 mg	50 mg	50 mg
<b>Full Throttle</b>	16 oz	220	58 grams	1.4 mg	1,210 mg	30 mg	180 mg
<b>Monster</b>	16 oz	200	54 grams	No amt given	2,000 mg	No amt given	400 mg
<b>SoBe NoFear</b>	16 oz	260	66 grams	100 mg	2,000 mg	50 mg	100 mg

### **Energy Drinks & Alcohol: Recipe For Disaster?**

Usually, the depressant effect of alcohol causes fatigue, which slows down a person's drinking. But a bar patron or partygoer who consumes an energy drink (laden with caffeine) will stay awake longer – and therefore can consume more alcohol. A recently published study found that ingestion of energy drinks with alcohol significantly reduced a subject's perception of headache, weakness, dry mouth, and impairment of motor coordination. Lastly, since both caffeine and alcohol are diuretics, the combination of the two can be very dehydrating.

### **Getting Out The Message**

Due to many of the concerns raised above, it is not surprising that some countries have started to place restrictions on energy drinks. For example, Australia requires a warning label on energy drinks that reads, "This food is not recommended for children, pregnant or lactating women and individuals sensitive to caffeine." For young people and families seeking increased energy, pediatricians can instead simply prescribe a balanced diet, regular exercise, and adequate sleep.

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