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NUTRITION AND HEALTH INFO SHEET

Energy Drinks

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What are energy drinks?

The term *energy drink* refers to a beverage that contains caffeine in combination with other ingredients such as taurine, guarana, and B vitamins, and that claims to provide its consumers with extra energy.¹ This term was created by companies in the beverage industry¹ and is not recognized by the United States Food and Drug Administration (FDA) or the United States Department of Agriculture (USDA).

Is there evidence that these energy drinks increase energy?

There is limited evidence that consumption of energy drinks can significantly improve physical and mental performance,² driving ability when tired,³ and decrease mental fatigue during long periods of concentration.⁴ Unfortunately, the body of literature is limited and it is not known whether these improvements are due to the caffeine, other herbal ingredients, or as a result of the combination of the ingredients found in the beverage.²

Can consumption of energy drinks have adverse effects?

The caffeine content of a single serving of an energy drink (8 to 12 fl oz) can range from 72 to 150 mg; however, many bottles contain 2 to 3 servings, raising the caffeine content to as high as 294 mg per bottle. (See the metric conversion table at the end of this publication.) In comparison, the caffeine content per serving of brewed coffee, tea, and cola beverages (8 fl oz) ranges from 134 to 240 mg, 48 to 175 mg, and 22 to 46 mg respectively.⁵ A recent literature review determined that consumption of up to 400 mg of caffeine daily by healthy adults is not associated with adverse effects.⁵ However, groups that are at risk, such as women of reproductive age and children, should limit their daily consumption of caffeine to a maximum of 300 mg for the former and 2.5 mg/kg body weight for the latter;⁵ thus they may need to avoid consuming energy beverages with a higher caffeine content. Adolescents should also limit caffeine consumption, as intakes greater than 100 mg per day have been associated with elevated blood pressure.⁶ Based on these findings, consumption of energy drinks by pregnant or nursing women, adolescents, and children is not recommended.

Caution is warranted even for healthy adults who choose to consume energy beverages. Consumption of a single energy beverage may not lead to excessive caffeine intake; however, consumption of two or more beverages in a single day can. Other stimulants such as guarana and ginseng are often added to energy beverages and can enhance the effects of caffeine. Guarana, in particular, contains caffeine (1 g of guarana is nearly equal to 40 mg of caffeine)⁷ and may substantially increase the total caffeine in an energy drink. Adverse effects associated with caffeine consumption in amounts of 400 mg or more include nervousness, irritability, sleeplessness, increased urination, abnormal heart rhythms (arrhythmia), decreased bone levels, and stomach upset.⁵

Furthermore, energy drinks contain added sugar. According to the USDA Dietary Guidelines, sugar should be limited in the normal daily diet.



What is the caffeine and sugar content of energy drinks?

Drink	Serving (fl oz)	Servings per container	Sugar per serving (g)	Caffeine per serving (mg)	Kcal
Diet Rockstar Energy Drink	8	2	0	80	10
Full Throttle	8	2	29	72	111
Go Girl Sugar Free	12	1	0	150	3
Lo-Carb Monster XXL	8	3	3	80	10
Monster Energy Assault	8	2	27	80	100
Monster Energy XXL	8	3	27	80	100
Red Bull	8.3	1	27	80	110
Red Bull Sugar Free	8.3	1	0	80	10
Rockstar Energy Drink	8	2	30	80	130
Rockstar Juiced	8	2	21	80	90
Wired 294 Caffeine	8	2	26	147	100

Note: This table does not include amounts of other stimulants found in energy drinks that can enhance the effects of caffeine.

There are many unusual ingredients in energy drinks. What do they claim to do?

Ingredient	Drink	Functional claims
carnitine	Monster, Rockstar, Full Throttle	improves endurance ¹⁴ , increases fat metabolism ¹⁵ ; protects against cardiovascular disease ¹⁶
glucuronolactone	Go Girl Sugar Free, Red Bull, Monster	promotes excretion of toxins and protects against cancer ¹
guarana	Monster, Rockstar, Full Throttle	increases energy, enhances physical performance, and promotes weight loss ¹⁸
inositol	Go Girl Sugar Free, Red Bull, Monster, Rockstar, Wired B ₁₂ Rush	decreases triglyceride and cholesterol levels, lowering risk of cardiovascular disease ¹³
panax ginseng	Monster, Rockstar	speeds illness recovery; improves mental, physical, and sexual performance; controls blood glucose and lowers blood pressure ¹⁷
super citramax (hydroxy citric acid, garcinia cambogia extract)	Go Girl Sugar Free	suppresses appetite, resulting in weight loss ¹⁰
taurine	Go Girl Sugar Free, Red Bull, Monster, Rockstar, Full Throttle	lowers risk of diabetes ¹¹ , epilepsy, ¹¹ and high blood pressure ¹²
yohimbine HCl	VPX Redline	improves sexual performance ^{8,9} and promotes weight loss ¹⁰

Is there scientific evidence to support these claims?

Ingredient	Scientific evidence
carnitine	There is no clinical evidence that carnitine use is effective for increased endurance ¹⁴ or weight loss, ¹⁵ but it may protect against heart disease. ¹⁶
glucuronolactone	Scientific evidence does not exist to support claims regarding the efficacy of glucuronolactone. ¹
guarana	A major component of guarana is caffeine. ¹³ Caffeine consumption has been associated with increased energy, enhancement of physical performance, and suppressed appetite.
inositol	Scientific evidence does not exist to support claims regarding the efficacy of inositol. ¹³
panax ginseng	Scientific evidence does not exist to support claims regarding the efficacy of panax ginseng. ¹⁷
super citramax (hydroxy citric acid, garcinia cambogia extract)	There is scientific evidence that use of this supplement decreases food consumption. ¹⁰
taurine	Clinical evidence is insufficient to show that taurine is effective in treating diabetes or epilepsy, ¹¹ but it may lower blood pressure. ¹²
yohimbine HCl	Although yohimbine HCl may increase blood flow to sexual organs, there is no evidence that it increases sexual arousal. ⁸ It may be effective at treating erectile dysfunction. ⁹ Currently no evidence exists to support the claim that use of this supplement leads to weight loss. ¹⁰

Is consumption of these ingredients safe?

Ingredient	Safety
carnitine	Insufficient data exists to establish the safety of carnitine use. ¹⁵
glucuronolactone	Insufficient data exists to establish the safety of glucuronolactone use at the concentrations found in energy drinks. ¹
guarana	This substance is generally regarded as safe by the Food and Drug Administration Center for Food Safety and Applied Nutrition (FDA CFSAN).
inositol	Inositol is generally regarded as safe (GRAS) by the Food and Drug Administration.
panax ginseng	Insufficient data exists to establish the safety of panax ginseng use. ¹⁷
super citramax (hydroxy citric acid, garcinia cambogia extract)	Insufficient data exists to establish the safety of super citramax use. ¹⁰
taurine	Insufficient data exists to establish the safety of taurine use. ¹
yohimbine HCl	Approved for use by the FDA to treat hypertension and sexual dysfunction, but over-the-counter use is not recommended. ¹⁰

Should energy drinks be consumed before or during exercise?

Caffeine is known to increase endurance and its use is therefore banned by the International Olympic Committee.¹⁹ Research has found consumption of caffeine prior to heavy exercise to be safe; however, the safety of consuming caffeine in combination with other herbal supplements found in energy drinks prior to or during exercise has yet to be established.¹ Until the safety of this practice can be established, consumption of energy drinks prior to exercise by individuals of any age is not recommended.

Should children and adolescents consume energy drinks?

A recent survey of 78 youth (ages 11–18) found that 42.3 percent of participants consumed energy drinks;²⁰ however, the effects of energy drink ingredients on children and adolescents has raised concern.¹³ In adolescents, caffeine consumption has been associated with an increase in blood pressure.⁶ Based on the limited data regarding safety, it is not recommended that children or adolescents consume energy drinks.

Is it safe to mix energy drinks with alcohol?

A recent study investigating the effects of energy drink consumption in combination with alcohol reported that, despite not feeling intoxicated, participants performed just as poorly on objective measures of motor coordination and reaction time as they did after consumption of alcohol alone.²¹ In short, an individual may unknowingly overlook the debilitating effects of intoxication because of the sensation of alertness produced by an energy drink. Furthermore, both caffeine and alcohol act as diuretics, increasing the likelihood of dehydration and adverse cardiovascular effects. For these reasons, it is not recommended to consume energy drinks in combination with alcohol.

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Metric Conversions

English	Conversion factor for English to Metric	Conversion factor for Metric to English	Metric
grain	64.80	0.015	milligram (mg)
fluid ounce (fl oz)	29.57	0.034	milliliter (ml)
ounce (oz)	28.35	0.035	gram (g)

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