

# NUTRITION AND HEALTH INFO-SHEET

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## Energy Drinks

### *What are energy drinks?*

The term “energy drinks” refers to beverages that contain caffeine in combination with other ingredients such as taurine, guarana, and B vitamins, and are purported to provide its consumers with extra energy (1). This term was created by companies in the beverage industry (1) and is not recognized by the United States Food and Drug Administration or the United States Department of Agriculture.

### *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 a beverage (2).

### *Can consumption of energy drinks have adverse effects?*

The caffeine content of a single serving of “energy drink” can range from 72 to 150 mg; however, many bottles contain 2-3 servings, raising the caffeine content to as high as 294 mg per bottle. In comparison, the caffeine content, per serving (8 fl. oz.), of brewed coffee, tea, and cola beverages ranges between 134-240 mg, 48-175 mg, and 22-46 mg respectively (5). A recent literature review determined that consumption of  $\leq 400$  mg caffeine daily by healthy adults is not associated with adverse effects (5). At risk groups such as women of reproductive age and children should limit their daily consumption to  $\leq 300$  mg caffeine and  $\leq 2.5$  mg caffeine/kg body weight, respectively (5) and may need to avoid consuming energy beverages with a higher caffeine content. Adolescents should limit caffeine consumption as well as intakes  $> 100$  mg/day has 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. It must be stressed that 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 (1g guarana  $\approx 40$  mg caffeine) (7) and may substantially increase the total caffeine in an energy drink. Adverse effects associated with caffeine consumption in amounts  $\geq 400$  mg include nervousness, irritability, sleeplessness, increased urination, abnormal heart rhythms (arrhythmia), decreased bone levels, and stomach upset (5).

Furthermore, it should be noted that energy drinks contain added sugar, which should be limited in the diet according to the USDA Dietary Guidelines.

***What is the caffeine and sugar content of energy drinks?***

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

\* This chart does not include amounts of other stimulants found in energy drinks which can enhance the effects of caffeine.

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

| <b>Ingredient</b> | <b>Found In</b>  | <b>Functional Claims</b>   |
|-------------------|--|--|
| Yohimbine HCL     | VPX Redline™   | Improve sexual performance (8, 9) and promote weight loss (10)   |
| Super Citramax    | Go Girl Sugar Free™  | Suppress appetite resulting in weight loss (10)  |
| Taurine           | Go Girl Sugar Free™, Red Bull™, Monster, Rockstar™, Full Throttle™               | Lower risk of diabetes (11), epilepsy (11), and high blood pressure (12)   |
| Glucuronolactone  | Go Girl Sugar Free™, Red Bull™, Monster™   | Promote excretion of toxins and protect against cancer (1)   |
| Inositol          | Go Girl Sugar Free™, Red Bull™, Monster™, Rockstar™, Wired B <sub>12</sub> Rush™ | Decrease triglyceride and cholesterol levels, lowering risk of cardiovascular disease (13)                                     |
| Carnitine         | Monster™, Rockstar™, Full Throttle™  | Improve endurance (14), increase fat metabolism (15); protect against cardiovascular disease (16)                              |
| Panax Ginseng     | Monster™, Rockstar™  | Speed illness recovery; improve mental, physical, and sexual performance; control blood glucose, and lower blood pressure (17) |
| Guarana           | Monster™, Rockstar™, Full Throttle™  | Increase energy, enhance physical performance, promote weight loss (18)  |

***Is there scientific evidence to support these claims?***

| <b>Ingredient</b> | <b>Scientific Evidence</b>  |
|-------------------|---|
| 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). There is not currently evidence to support the claim that use of this supplement leads to weight loss (10). |
| Super Citramax    | There is scientific evidence that use of this supplement decreases food consumption (10).   |
| Taurine           | There is not sufficient clinical evidence to show that taurine is effective in treating diabetes or epilepsy (11), but it may blood pressure (12).  |
| Glucuronolactone  | There is not scientific evidence to support claims regarding the efficacy of glucuronolactone (1).  |
| Inositol          | There is not scientific evidence to support claims regarding the efficacy of inositol (13).   |
| 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).  |
| Panax Ginseng     | There is not scientific evidence to support claims regarding the efficacy of panax ginseng (17).  |
| Guarana           | A major component of guarana is caffeine (13). Caffeine consumption has been associated with increased energy , enhancement of physical performance, and suppressed appetite.   |

***Is consumption of these ingredients safe?***

| <b>Ingredient</b>   | <b>Safety</b>   |
|---|---|
| Yohimbine HCL   | Approved for use by the FDA to treat hypertension and sexual dysfunction, but over the counter use is not recommended (10).                       |
| Super Citramax (Hydroxy Citric Acid, Garcinia Cambogia Extract) | There is insufficient data to establish the safety of super citramax use (10).  |
| Taurine   | There is insufficient data to establish the safety of taurine use (1).  |
| Glucuronolactone  | There is insufficient data to establish the safety of glucuronolactone use at the concentrations found in energy drinks (1).                      |
| Inositol  | Inositol is generally regarded as safe (GRAS) by the Food and Drug Administration.  |
| Carnitine   | There is insufficient data to establish the safety of carnitine use (15).   |
| Panax Ginseng   | There is insufficient data to establish the safety of panax ginseng use (17).   |
| Guarana   | This substance is generally regarded as safe (GRAS) by the Food and Drug Administration Center for Food Safety and Applied Nutrition (FDA CFSAN). |

***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/ or adolescents consume energy drinks?*

A recent survey of 78 youth (11-18 years) found that 42.3% of participants consumed energy drinks (20); however, concern has been raised about the effects of ingredients found in energy drinks on children and adolescents (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 investigation looking at the effects of consumption of an energy drink 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 feel more alert even though he or she is still intoxicated. 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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