

Analysis of energy drinks such as Red Bull, Play, Monster, Switch and many more.

Abuse, sensitivity, pre-existing risk factors or combination of contraindicated medications with energy drinks can lead to a vast array of medical complications ranging from slight discomfort to critical complications and even death. I have personally experienced several diabetic complications, 12 cardiac related hospitalisations as well as 5 unnatural deaths related to over use of energy drinks

Common ingredients:

Most carbonated energy drinks of South Africa contain:

- Carbonated water
- Sugar
- Citric acid
- Carnosine
- Caffeine
- Sodium Benzoate
- Taurine
- Sucralose
- Vitamin B 12
- Vitamin B 6

Additionally some energy drink manufacturers add different types of preservatives and sweeteners such as trisodium citrate and sorbitol.

Upon examination of most energy drink cans the following observation were made:

- There are no clear warnings about the dangers of the contents
- There are no dosage recommendations
- Ingredient lists and warnings (if present) are small, universal colours hidden behind simple abstract colouring and visual marketing (blending into the background)
- Ingredient lists only list the ingredients in 100ml servings while the marketing labels the entire beverage as a serving (500ml)

All ingredients in these energy drinks have medical relevance in both short term over dosage as well as long term exposure.

Long term exposure to carbonation can cause cancerous tumours, hypoxia (the inability of red blood cells to bond with oxygen molecules), IBS, Tooth decay and loss of bone density.

Long term exposure to sugars can lead to diabetes, kidney failure and pancreatic diseases.

However the short term overdosing of the following ingredients are the most troublesome

- Caffeine
- Trisodium citrate

- Taurine
- Vitamin B 12
- Vitamin B 6

Which can lead to:

- Headaches
- Dizziness
- Diarrhoea
- Nausea
- Tingling in extremities
- Vomiting
- Stomach cramps
- Muscle spasms
- Heartburn
- Photosensitivity
- Reduced ability to sense pain or extreme temperatures
- Changes in alertness
- Increased thirst
- Anxiety
- Desensitizing
- Disassociation
- Paranoia
- Agitation and aggression
- Fever
- Shock
- Sleeplessness
- Hallucinations
- Tremors
- Convulsion
- Laboured breathing
- Fluid retention
- Painful, disfiguring skin lesions
- Ataxia (loss of muscle control, coordination and movement)

- Metabolic alkalosis. (similar to carbon monoxide poisoning)
- Heart palpitation
- Irregular heartbeat
- Bradi- and Tachi-cardia
- Hypo- and Hyper- tension
- Renal fatigue
- Hepatic disease

As follows the recommended dosages vs actual dosage in carbonated energy drink switch compared to the fatal dosage.

Ingredient	Recommended daily dose	Dose in energy drink	Fatal dose
Caffeine	400mg	160mg-500mg	5g-10g
Trisodium citrate	24-59mg	291mg	150mg-600mg
Taurine	400mg	1500mg/1.5g	6000mg/6g
Vitamin B6	1.5mg-1.7mg	7mg	1000mg/1g
Vitamin B12	2.4µg	25µg	1000µg/ 1mg

Several factors increase or decrease the chances of having a fatal experience while consuming these ingredients such as:

- Age
- Allergens
- Availability to medical attention (golden hour)
- Body mass index
- Contraindicated medication
- Chronic & hereditary conditions
- Development
- Dietary intake
- Exposure
- Immunity
- Metabolism
- Sensitivity to ingredients
- Stress levels

Contraindicated medication:

- Adrenaline
- Anticoagulants
- Antibiotics
- Anti-inflammatorys
- Antihistamines
- Antidepressants
- Antidiabetic medications

- Analgesics
- Amino salicylic acid
- Asthma medication
- Beta-blockers
- Cardio stimulatory drugs
- Contraceptives
- Ephedrine
- Epinephrine
- Phenothiazine (muscle relaxant)
- Sedatives
- Theophylline (muscle relaxant)
- Protein pump inhibitors
- Vitamin C

Recommended selling age 12years+

In the case of vitamin B6 and B12 the dosages apply to artificially made chemicals

Annual average alcohol consumption per person in litre in South Africa 9.4l

Annual average energy beverage per person in litre in South Africa 2l annual increase since 2009 currently 26l. Keeping in mind that this projection is the factor of sales and not the consumption of South Africans which is stable at 27% - 30% of the population.

In conclusion a well-regulated control over the substance and intelligent consumption would deem this product safe for use however abuse and ignorance when it comes to the consumption of energy drinks can lead to dire situations that we seem to have currently. I also want to emphasize that these products do not include PowerAde, Energade or even Coca-Cola. Only caffeinated energy drinks found nationwide.

All facts and statistics can be found at:

<https://www.mayoclinic.org/drugs-supplements>

<https://worldpopulationreview.com/country-rankings>

<https://www.wikipedia.com>