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**Effects of Energy Drinks on Short Term Memory and the Reaction Time**

“Energy drink” is generally defined as a “drink which contains ingredients claimed to enhance both mental and physical performance.” The ingredients are different, so the effects probably vary. The World Health Organization is considering energy drink consumption a public health threat, and believes that aggressive marketing campaigns towards children, teens, and young adults needs more regulation. In 2011, in the US, 20,000 patients asked for emergency medical services after consuming energy drinks – either alone (most of the cases) or mixed with another stimulant.

Are the effects on mental and physical performance really worth a visit to the emergency room? Of course not.

Are the effects real or placebo?

Let’s see what a research on Bonaire tells us.

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Effects of Energy Drinks on Short Term Memory and the Reaction Time

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Introduction
An energy drink is a type of beverage containing stimulant drugs, chiefly taurine, which is marketed as providing mental and physical stimulation. They may or may not be carbonated and many also contain sugar or other sweeteners, herbal extracts and amino acids. Other commonly used ingredients are guarana, yerba mate, caffeine, acai and glucuronolactone. Studies have shown that taurine, when mixed with caffeine, has increased athletic performance by increasing mental functioning. The goal of our research was to confirm if they really improve an individual's mental functioning - namely reaction time and short term memory. Our hypothesis was that the administration of the energy drink would improve both reaction time and short term memory. Excessive consumption of energy drinks may induce mild to moderate euphoria primarily caused by stimulant properties of caffeine and may also induce agitation, anxiety, irritability and insomnia.

Material and Methods
The effects of energy drinks on short term memory were evaluated in a placebo controlled study design. We pooled our test subjects from the MD3 and MD4 population at St. James School of medicine, Bonaire for a total number of 20 volunteers: 10 female and 10 male, age range of 21-26 years. Two groups of participants with nonrandom allocation to “low” and “high frequency” consumption categories were further divided into two sub-groups. The substances used in the treatment were Redbull and a placebo (sugar + apple juice). Participants were asked to wait for 30 minutes prior to taking the reaction and recall tests. Subjects were assessed at the beginning of the first week to set a baseline for memory function. The tests were given one month after the initial test date and recorded by the same designated researcher. All of the data were transcribed into excel spreadsheets for computation. Tested were reaction time and short term memory, both using online tools (humanbenchmark.com tests and http://faculty.washington.edu/chudler/stm0.html, respectively). The reaction test prompted each participant to respond to light signals which was measured in m/sec, and the recall test allowed participants one minute to view and memorize a list of letter, followed by another minute to write down as many letters as they can recall from the original list.

Discussion
The findings of our study were consistent with similar research done on energy drinks and mental functioning. Our results show that reaction time and short term memory improved after administration of the Red Bull. We also see an interesting correlation that as the age increases in our test subjects, so do the results of the reaction time and memory test.

Conclusions and recommendations
Our results show that reaction time and short term memory improved after administration of the Red Bull. Our sample size however was very small which makes it difficult to conclude if the results are statistically significant. It is also difficult to pinpoint which ingredients are responsible for the results of the experiment because the study looked at effects of Red Bull and not its ingredients specifically; some ingredients may be present in very small quantities, but they could be more potent. Also, the potency of Red Bull seems to be influenced by the age. Future researches on Red Bull, an in depth analysis on the quantity and effects of each and every ingredient in different age groups and a larger sample size shall be performed to explain the effects of energy drinks in humans.

References
Matsui Chetana Shinagat, Guillaume Marcy,1, Guoian Louril,1, Jae Ryun Ryul,1, Xianfeng Zhao2, Francis J. Rosales2, Eyleen L. K. Goh. Taurine Induces Proliferation of Neural Stem Cells and Synapse Development in the Developing Mouse Brain.

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