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THE NEGATIVE EFFECTS OF CAFFEINE AND TAURINE CHEMICALS CONTAINING LOW-ALCOHOL ENERGY (TONIC DRINKS) "YAGUAR ORIGINAL" AND "RED DEVIL ALCOENERGI" DRINKS IN THE HUMAN BODY

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Annotation
This article analyzes In this article, we studiyed the composition of low-alcohol energy drinks included in the tonic drinks “Uaguar original” and “Red Devil alcoenergi”the turnover of low-quality counterfeit products on world markets using the example of foreign countriyes. The negative impact of low-quality goods on human health and the economy of countries is substantiated. At the same time, modern methods for determining caffeine by liquid chromatography gas have been developed and introduced into the customs system. The analysis revealed that non-alcoholic energy drinks contain an excessive amount of caffeine.

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Energy and low-alcohol energy drinks are now the most popular type of fluid consumed, and its production is rapidly developing. The drinks assortment is very wide: by type of fragrance, by the form of release (liquid and powdered concentrates, ready-made drinks), by alcohol content (non-alcoholic and low-alcohol). However, not all drinks can be beneficial to human health, especially alcohol. Low alcoholic beverages are juices, juice concentrates, beekeeping products, grapes, fruits, rectified ethyl alcohol, infusions and extracts of vegetable materials, drinks made from sugar or substitutes, with a share of ethyl alcohol ranging from 1.5% to 9.0%. Adding the food supply of aromatic additives, dyes, water and other components is products that have long been known in the country and in MDH countries, including honey, scrapes, beer, but raw materials for their production. Therefore, the most common are gassed low-alcoholic beverages containing juice or low-alcoholic beverages made from concentrates that are a product of chemical industry development. They are only taste substitutes, and sometimes completely unseen. Consuming large quantities of such drinks is harmful to health. Drinks production has been expanding in recent decades and a special group of tonic drinks, energy drinks, has appeared in the consumer goods market. Their assortment is on the rise surprisingly, despite the cautious and sometimes negative attitudes of public officials, health care providers and people leading and promoting healthy lifestyles. However, the energy drinks consumer segment is growing. This is due to the free, unlimited sale of non-alcoholic and non-alcoholic energy drinks. The core consumer segment includes young people between the ages of 11 and 35. The

average age at which a teenager begins to consume alcohol is 12-13 years old. In the age group of 11-24, more than 40 percent consume alcohol. At the same time, girls consume alcoholic beverages on a par with boys Currently, there is no federal law regulating the production and distribution of tonic drinks at the federal level. [11,8,9]

From these indicators, tonic drinks pose a health hazard. In addition, GOSTs indicate the need to provide manufacturers with recommendations to tonic drinks consumers to limit daily consumption (in packaging units) in accordance with the composition of biologically active ingredients in consumer packaging and the values of permitted high levels of daily consumption. It should also be noted that in accordance with GOST R 52845-2007, the volume of ethyl alcohol in low-alcohol tonic drinks should be 1.2-9.0 percent. If ethyl alcohol contains more than 1.5 percent of the volume of the finished product, which is less than 1.5 percent, it applies to certain restrictions. A particular concern of those who oppose this type of product is due to the growth in the production of low-alcohol energy drinks, which is very popular among young people. Statistics show that Russians drink 6 million liters of alcohol-free drinks and 37 million liters of low-alcohol energy drinks annually. Among the most popular energy drinks, including alcohol, the most popular are Yaguar Original, Yaguar Light (Yaguar 9% and 5.5% of all kinds of alcoholics) and Red Devil Alcoenergi (with Red Devil Alcoenergi) alcohol content of 9%. According to GOST R 52845-2007"Low Alcohol Tonic Drinks. General technical conditions only regulate the composition of the following components—Ethanol (ethyl alcohol, methyl carbinol, vinegar alcohol, pentahydrodiarboniy hydroxide, most commonly simply "alcohol" or alcohol) — C_2H_5OH or CH_3CH_2-OH, the second representative of the gomologic series of monohydric alcohol. A liquid with a combustible, colorless, distinctive smell and bitter taste. In accordance with GOSTs 5964-72, 5964-82 and 18300-72, "... first refers to powerful drugs that excit the nervous system and then lead to paralysis." "In active mode containing alcohol. Its composition in energy drinks is indicated in the range of 1.2% to 9.0% by GOST, in fact these drinks are close to 9.0% extreme value. According to research on alcohol content, 1 box of such a cocktail is worth 50 g of vodka. Even eating 2 boxes of cocktails a week can help alcoholism develop. Statistics show that young people aged 18-22 do not know how to limit themselves to alcohol consumption and can drink between 5 and 10 in one day in a good company.Low alcoholic energy drink boxes. The stimulating effects of energy drinks leave the wrong impression of how drunk a person is and how poisoned the body is with alcohol. Hangover fatigue is a natural protective reaction of the body against excessive drinking. An energy officer will turn off this protection. And no matter how cheerful a person feels, the concentration of alcohol in the blood can reach extreme values. When the tonic effect is over, a severe hangover begins, which causes problems with the heart and breathing. Caffeine is a class of compounds called methylxantines, 1.3.7-trimethylpurin-2.6-dion. White silk needle-shaped crystals or bitter-tasted, odorless white crystal powder. It dissolves badly in water (1:60), easily dissolves in hot water (1:2), and dissolves hard in alcohol (1:50). Caffeine is extracted from waste tea and coffee beans. In the industry, caffeine is synthesized with urinary acid and xanthine. It is available in many foods— tea leaves (up to 4%), coffee seeds (up to 2%), cola nuts (up to 6%), cocoa beans (up to 4%), guarana fruits (up to 6%). Taurine alkaloids are widely used in medicine as stimulants of the central nervous system, which increases the vital activity of all tissues of the body. It accelerates general metabolism, increases breathing and blood circulation, and stimulates cortical processes. In addition to one of the main effects of caffeine -- increasing adrenaline release and mobilizing fatty acids into the bloodstream -- there are many biochemical and physiological effects after consuming it. All of these effects contribute to improving the mental and physical functioning of the body, such as increasing visual response, empowering, increasing muscle activity, and reducing fatigue, fatigue and feelings of pain. At the same time, caffeine has its drawbacks—if abused, it can dampen the nervous system, as can other stimulants. Long-term use can

cause caffeine dependence. After getting into the pancreas, caffeine begins to move immediately after it is absorbed, but the stimulating effect is short-lived and takes about 30 minutes. In addition to the ability to increase secretions of caffeine, gastric and intestinal juices, it sharply increases intestinal motorcycles. The movement of feed through the gastrointestinal tract is accelerated. [6,1,4]

There is no time for food to be fully digested. As a result, rotting and fermentation processes develop in the intestines. Protein components of food begin to rot, and carbohydrate components begin fermentation.

It is believed that the recommended acceptable level of caffeine is 150 mg per day, but a recent study estimates that the optimum dose of caffeine is 200 mg per day. For people, the dose of caffeine kills between 0.151 and 0.400 mg/cm^3 by GOST. One box of Red Bull contains 80 mg of caffeine (about the same amount in a cup of coffee), 350mg of Coca-Cola in a 350 ml bank and 47 mg of Diet Cola. According to the study, 300 mg of caffeine was found in the Yaguar container, equivalent to three to four cups of strong coffee. The Red Devil contains 30 mg/cm^3. Caffeine in energy drinks can be synthetic or natural. Synthetic caffeine is caffeine in free form, and its effects are more aggressive than natural alkaloid, which is connected to the components of protein structures and is gradually released. Thus, the effects of natural caffeine slow down and are not so harmful to the body. .[5,1,8]

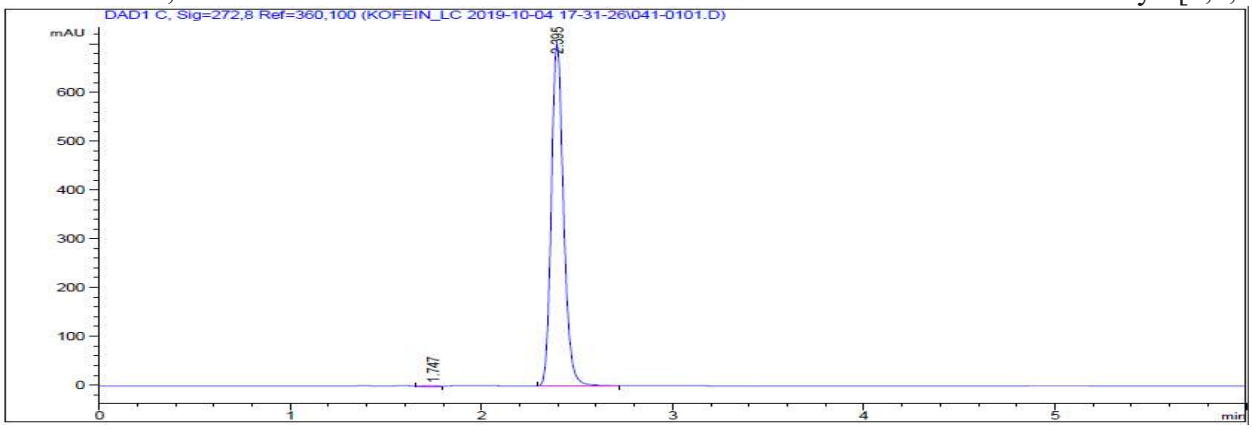


Figure 1. Analysis of caffeine, taurine and guarana in **“Jaguar orginal”** a low-alcohol beverage, by high-performanse liquid chromotograph.

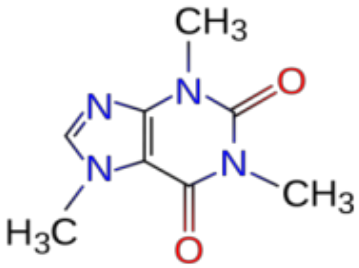


Figure 2. Chimical formula of caffeina

Guarana is used to increase the duration of energy drinks and introduce a less aggressive type of natural caffeine that is much better absorbed by the gastrointestinal tract without any side effects. Guarana is a wooden plant that can climb up to 10 meters in height and is located in the Amazon Basin. Since ancient times, Brazilian Indians have used a drink made from guarana fruit to restore strength. Guarana contains more caffeine than any plant known so far. Therefore, its stimulating potential is 2-5 times higher than that of coffee. Guarana helps improve metabolism, improves oxygen delivery to brain cells, accelerates the hydrogenation of fats and removes lactic acid from muscle tissue. Caffeine from guarana is gradually absorbed, allowing you not to feel fatigue for a long time. The result is increased viability, efficiency, reaction speed and concentration. Together, caffeine and alcohol enhance the effects of kidney function and increase the effect of alcohol on the brain. A person does not notice this during rest, but during severe physical abuse, when the body works at the limit

of its capabilities, caffeine-alcohol dehydration can lead to death. And such cases are known -- three deaths in Sweden and two in the US.Taurine (B-aminoyethansulfonic acid) is a biologically active substance. Some researchers call it an amino acid, while others call it a vitamin-like substance. Taurin was first separated from the bull bile in 1827. White crystal powder is dissolved by decomposition. It dissolves well in water, but it dissolves badly in most organic solvents. Under physiological conditions, the pH is 7.4. Taurine is often referred to as an amino acid containing sulfur, but this is not entirely true from the point of view of modern chemistry because the molecule does not have a carboxyl group. Free taurine in the body is present in the brain and spine, peripheral nerves, muscles, liver, blood and milk. Taurin helps to improve energy processes, stimulates separation processes in dystrophic diseases and processes that occur with important metabolic disorders of the eye tissue. The taurine, an amino acid containing sulfur, helps normalize cell membranes activity and improve metabolic processes. It helps reduce blood sugar in humans and is therefore used to treat diabetes. Taurine has osmoregulating, antioxidant, membrane-protecting and detoxifying properties and helps to eliminate cholesterol. All this allows you to improve and restore the functioning of the muscles and nervous system and helps you get rid of stress. Taurine restores the energy of nerve cells so much that memory, attention and mood improve sharply. [3,6,1]

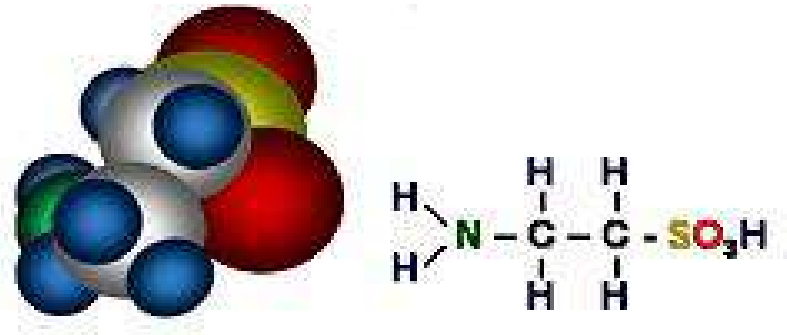


Figure 3. Chimical formula of Taurine

There is no real point in adding microdozas of taurine to such drinks, a more common advertising campaign than supplements that alter the properties of beverages in any way. However, combined with alcohol and some other components, taurine can cause nervous excitement. Therefore, for people with high levels of arousal and alcohol sensitivity, it is not recommended to consume drinks containing taurine. According to GOST, the amount of taurine in low-alcohol energy drinks is allowed in a wide range of ranges -- between 30 and 400 mg/cm^3. Yaguar contains 40 mg/cm^3, and the red devil is 30 mg/cm^3. There is no real point in adding microdozas of taurine to such drinks, a more common advertising company than supplements that alter the properties of drinks in any way. However, combined with alcohol and some other components, taurine can cause nervous excitement. Therefore, for people with high levels of arousal and alcohol sensitivity, it is not recommended to consume drinks containing taurine. According to GOST, the amount of taurine in low-alcohol energy drinks is allowed in a wide range of ranges -- between 30 and 400 mg/cm3. Yaguar contains 40 mg/cm3, and the red devil is 30 mg/cm^3.

L-carnitin is a human body that produces L-carnitin and also receives it through food, but under certain conditions the amount is not enough and additional carnitin is required to be consumed. L-Carnitin is an amino acid and, due to its important physiological role in the body, is included in vitamins B (vitamin B or B11). Depending on its physical characteristics: white crystal powder, odorless, easily dissolved in water, slightly dissolved in ethanol. L-carnitin is also called "growth vitamin" for its ability to stimulate growth. The main role of carnitination is to participate in fat metabolism and to provide energy to the body: it transfers fatty acids to mitochondria, which undergo

oxidation. It calms the nervous system, stimulates brain activity, improves immunity, activates the removal of toxins from the body, has beneficial effects on the cardiovascular system, stimulates regeneration and increases appetite. The daily need for children between the ages of 7 and 18 is 100-300 mg / day, and for adults it is 300 mg / day. According to GOST, the amount of L-carnitin in low-alcohol energy drinks is regulated between 80 and 120 mg/cm^3. There are no special warnings about the interaction of L-carnitin with alcohol, as their combination has not yet been studied. [2,3,6]

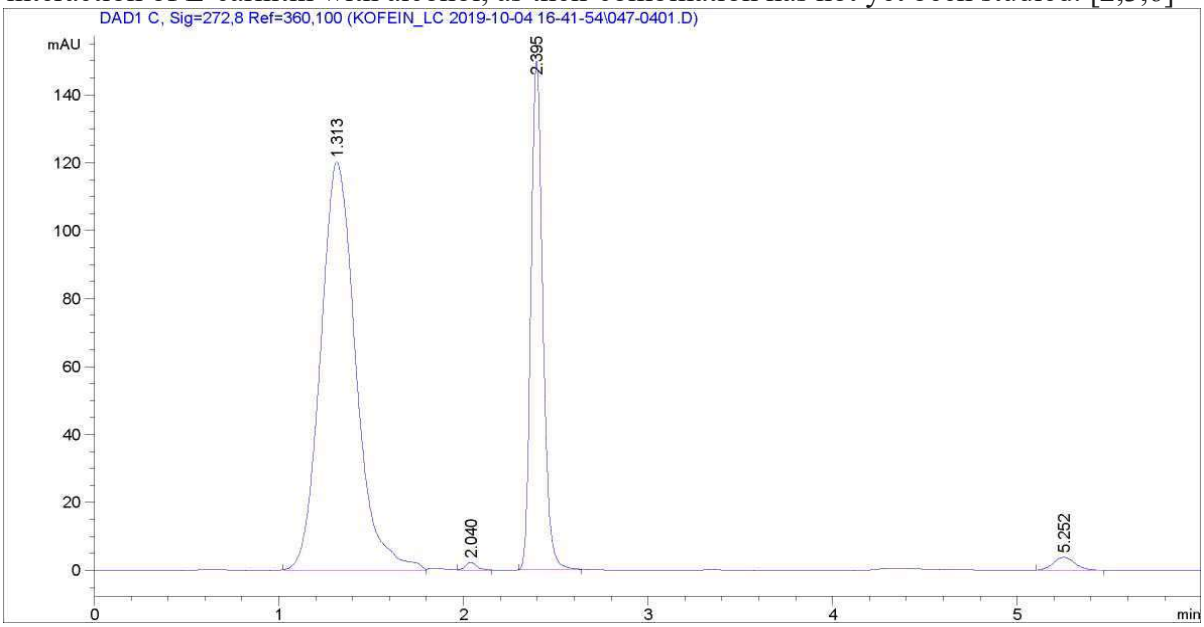


Figure 4. Analysis of caffeine, taurine and guarana in “Red Devil alcoenergi” a low-alcohol beverage, by high-performanse liquid chromotograph.



Figure 5. Structural formula for L-carnitin anion

However, fatigue brings the greatest benefits by preventing development and increasing the functioning of the body. This is usually explained by the fact that a very effective food is **an L-carnitin** substance, increases its antioxidant ability and removes toxic substances from the body by binding them to glucose. According to GOST, the amount of D-glucouronolakton in low-alcohol energy drinks is regulated between 150-240 mg/cm3. Together with alcohol, it causes fermentation effects. L-carnitin and D-glucouronolactene were not found in Yaguar and Red Devil energy drinks.

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